SEWERAGE AND THE TREATMENT AND DISPOSAL OF SEWAGE

ASSET MANAGEMENT PLAN

2018

DOCUMENT CONTROL SHEET

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SECTION 1 - EXECUTIVE SUMMARY

1.1 INTRODUCTION

This plan is Waitomo District Council (WDC) Sewerage and the Treatment and Disposal of Sewage (Wastewater) Asset Management Plan (AMP) including the proposed 2018-48 expenditure forecast for the wastewater 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 wastewater activity budgets contained in WDC's draft 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 WDC's wastewater assets 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 good asset management practices and demonstrates how the service potential of WDC's wastewater infrastructure will 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 WDC's 2018-28 LTP and supporting Infrastructure Strategy 2018-48. It is based on existing levels of service, currently available information and the knowledge, experience and judgment of Council staff and contractors.

There is a proposal to investigate the expansion of reticulated wastewater services to Mokau - Awakino where issues relating to septic tank failure and cross-contamination of shallow groundwater have been reported. Otherwise, the low rate of population growth and urban development is not expected to place demand for further wastewater infrastructure, consistent with WDC's 2014 Water and Sanitary Services assessment. The main obstacle is the high unit cost of providing consented wastewater services to small communities.

1.2 SCOPE OF WASTEWATER ACTIVITY

WDC owns and operates four separate wastewater (WW) schemes at Te Kuiti, Piopio, Te Waitere and Benneydale respectively.

Each scheme comprises a reticulation network, pump stations, treatment plant and effluent disposal system. Te Kuiti is the largest of the four schemes, containing 77% of the total length of reticulation.

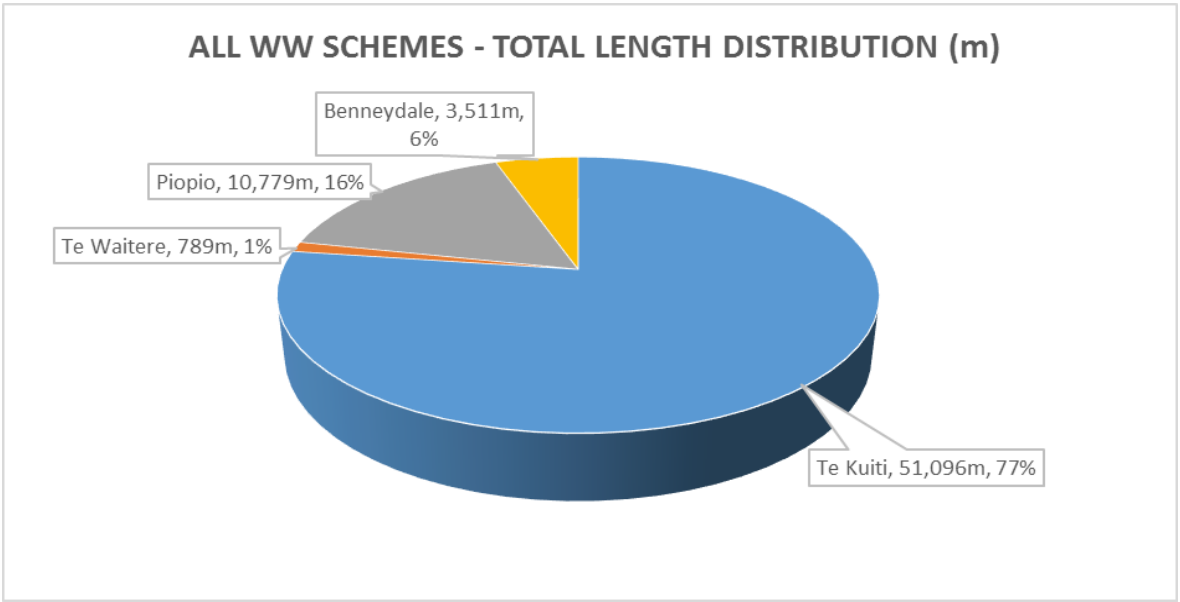


Figure 1.1: All WW Schemes

A summary of operating parameters for each scheme is shown in the table below.

Scheme	Resource consent expiry date(s)	Population served	Treatment capacity (m^3 per day)	Spare treatment capacity	Length of reticulation (km)	Sewer reticulation requiring replacement within the next 10 years
Te Kuiti	30 Jan. 2040	4,218 plus wet industries	Average 4,500m^3/d Peak flow capacity 7,000m^3/d	Avg. 1,650m^3/d. Peak = zero.	51.096	10%
Benneydale	1 May 2025	240	85	10%	3.511	10%
Te Waitere	31 July 2042	30-40	5.2	0	0.789	0.535
Piopio	30 June 2028	500	135	20%	10.779	0%

Figure 1.2: Summary of wastewater schemes main parameters

The optimised replacement and depreciated value of WDC's wastewater infrastructure as at 30 June 2015, distributed by community, is shown in the table below:

Optimised replacement Cost (ORC)	Optimised Depreciated Replacement Cost (ODRC)	Annual Depreciation
$ 37,406,731	$29,086,495	$750,849

Figure 1.3: Replacement Costs

The wastewater (and water supply) 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 wastewater 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 services 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"

The wastewater activity provides for the environmentally safe collection, treatment and disposal of the District's wastewater at Te Kuiti, Piopio, Benneydale and Te Waitere.

1.3.2 Community Outcomes

The Wastewater 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

- Wastewater is managed to preserve and protect the natural environment
- To meet the Community's needs by ensuring public health, social well-being and providing for economic growth

1.3.4 Rationale for Activity

The wastewater activity exists to ensure that the natural environment is protected from detrimental effects of sewage, and that the wastewater management needs of the District community are met.

1.4 SUMMARY OF ACTIVITY ISSUES

A brief summary of current issues at each existing wastewater scheme is as follows:

1.4.1 Resource consent expiry dates – All schemes

SCHEME	CONSENT EXPIRY DATE
Te Kuiti	30 January 2040
Piopio	30 June 2028
Benneydale	1 May 2025
Te Waitere	31 July 2042

Figure 1.4: Resource Consent Expiries

1.4.2 Te Kuiti

Treatment:

a. The upgraded treatment plant is a modified activated sludge system with clarification, filtration and ultra violet treatment before discharge capable of treating 7,000m^3 per day at peak.
b. Additional capacity would require duplication of the reactor and clarifier, currently rated at 4,000 and 4,500m^3/day respectively. Upgrade of the electrical supply capacity would also be required.
c. Average dry-weather inflow is 2,850m^3/d including significant trade waste discharge volume from two meat works plants.
d. The treatment plant is performing in accordance with the 2015 consent treatment standards. The consent expires in 2040.
e. Trade waste discharge consents are in place for both meat works plants.
f. High rainfall events result in high inflow/infiltration into the reticulation system which is managed by passing the excess inflow into storage ponds from where it is pumped back to the reactor and put through the full treatment process.
g. The higher effluent quality standards are resulting in additional sludge deposits. Dewatering and transporting accumulated sludge to the landfill has increased operating costs.
h. Routine servicing of the additional mechanical and electrical components (e.g. pond aerators), plus extra chemical (lime and alum) dosing has also increased operating costs.

Reticulation:

a. Overall the reticulation system is perceived to be in fairly good condition, providing the required level of service, although rainwater inflow and infiltration into parts of the system is high (approx. 5,000m^3/d) and creates surcharge problems at some points during high rainfall events.
b. The ingress of water due to inflow and infiltration is managed at the treatment plant through storage and pump back to front of treatment process without putting quality aspects of the discharge consent at risk.
c. Low areas of the reticulation occasionally overflow during a normal rainfall year due to surcharge of the system caused mainly by silt and gravel in the system and bottlenecks as result of poor planning or construction in the past. These issues are resolved as they become apparent.
d. Filter backwash from the upgraded Te Kuiti water treatment plant now discharges directly to the sewerage reticulation, causing siltation of the mains and pump-station.

Pump Stations:

a. The system contains four secondary pump stations and a terminal pump station.
b. Two of the pump stations have overflow pipes that may discharge into the Mangaokewa Stream during extreme rainfall events. This rarely happens and is reported if it does. There is a minimal health risk because of high dilution under such circumstances.
c. The main pump station was refurbished and reconfigured approximately 10 years ago to improve operation and maintenance and is monitored by SCADA and telemetry to optimise energy use and smooth flow, thereby also improving treatment plant operation.

1.4.3 Benneydale

a. Benneydale is a small town serviced with wastewater and water supply services. It was originally a mining and later a timber milling town.
b. The reticulation was extended in about 2014 so that all houses now have reticulated sewerage available.
c. The plant was upgraded in 2013 with a small wetland added as agreed with local Iwi.
d. A soakage field for summer discharge has been added to protect the recreational capacity of the Mangapehi Stream during low summer flows as required under the new consent.
e. The discharge consent expires 1 May 2025.
f. The plant has been remotely and routinely monitored using SCADA and telemetry since early October 2008.
g. Current spare design capacity equates to approximately 27 additional houses. Given the projected low to declining growth rates, this should be more than adequate for any growth over the next 30 years.
h. The reticulation is expected to have a remaining useful life of approximately 15 years.

1.4.4 Te Waitere

a. The system entails collection and disposal of septic tank effluent from approximately 11 residential properties. It has a very small discharge, averaging 1.6m^3 per day.
b. There have been no recorded pollution events at this facility, though anecdotal information suggests overflows into the harbour have occurred, due to occasional power failure of long duration.
c. There is no spare capacity without expanding the grey-water collection tank in which case the pump unit and its electrical supply may also have to be upgraded.
d. Discharge is to land. The consent for discharging up to 5.2m^3/day expires 31 July 2042.
e. The present soakage field is under stress and is technically overloaded even at the small daily volumes. The new consent requires a detailed investigation to be carried out once the discharge volume exceeds the equivalent of that from 12 residential dwellings. At that point, it is likely to require reconstruction to work effectively and additional land will be required.

f. A previous cadastral survey suggests that the land in the area of the soakage field is moving; at a rate of approximately 1.0m over 15 years.
g. There is no reported demand for residential development in the town and immediate surrounds. A high level, managed development plan for the area was considered by Council in December 2008 and put on hold. The whole area will need a full geotechnical stability assessment before any further development is approved.
h. The rising main from the main pump station was replaced in 2016/17. Refurbishment of the pump station was scheduled for 2017/18.

1.4.5 Piopio

a. The Piopio scheme is a small diameter reticulation system consisting of individual septic tanks as primary treatment with effluent pumped to a central treatment facility. The system was fully commissioned in late 2012. The necessary discharge consent application has been obtained and the scheme has been fully operational since June 2012, operating well within the discharge parameters.
b. The scheme services the residential and business areas of Piopio as well as the college and primary school.
c. Discharge from the treatment plant is to the Mokau River and is consented through to 30 June 2028 at a rate of up to 135.4m3/d.
d. The average discharge rate (2016/17) is 86.2m3/d, with a peak of 305m3/d. High inflow during heavy rainfall is a concern.
e. The scheme has spare capacity for an additional 23 residential connections.

1.5 LEVELS OF SERVICE

This AMP is focused on clarifying and defining key levels of service for each wastewater scheme and then identifying and costing future operations, maintenance, renewal and capital works required to provide these levels of service. The levels of service set out in Section 3 are based on customer expectations, strategic goals designed to achieve relevant Community Outcomes and statutory requirements. 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 activity 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	Sewerage System is adequate and is sufficiently maintained.	Number of complaints received in a financial year about ; • sewage odour; • sewage system faults; • sewage system blockages, and • Council's response to issues with the sewage system.	Total complaints per 1,000 connections ≤20 / Not achieved (47.5)	Total complaints per 1,000 connections ≤20	Total complaints per 1,000 connections ≤35	Total complaints per 1,000 connections ≤35	Total complaints per 1,000 connections ≤35	Total complaints per 1,000 connections ≤35
Vibrant Communities CO5 Effective Leadership CO5 Sustainable Infrastructure CO10	Environmental impacts of Sewerage systems will be managed effectively.	Compliance with the Council's resource consents for discharge from its sewerage system, measured by the number of the following: *(received by Council in a financial year)*						
		• abatement notices	Nil / Achieved (Nil)	Nil	0	0	0	0
		• infringement notices	Nil / Achieved (Nil)	Nil	0	0	0	0
		• enforcement orders	Nil / Achieved (Nil)	Nil	0	0	0	0
		• convictions received	Nil / Achieved (Nil)	Nil	0	0	0	0

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	Timely response and resolution for sewage overflows.	The median response times for attendance, in a year, measured from the time that the Council receives notification to the time that service personnel reach the site.	≤180 minutes (3hrs) / Achieved (<2 hours)	≤180 minutes (3hrs)	≤180 minutes (3hrs)	≤180 minutes (3hrs)	≤180 minutes (3hrs)	≤180 minutes (3hrs)
		The median response times for resolution, in a year, measured from the time that the Council receives notification to the time that service personnel confirm resolution of the blockage or other fault	≤ 540 minutes (9hrs) / Achieved (<6 hours)	≤ 540 minutes (9hrs)	≤ 540 minutes (9hrs)	≤ 540 minutes (9hrs)	≤ 540 minutes (9hrs)	≤ 540 minutes (9hrs)
Vibrant Communities CO5 Sustainable Infrastructure CO10	Provision of effective and reliable sewerage systems and service to the community.	Number of dry weather sewage overflows from the Council's sewerage system in a financial year.	Total complaints per 1,000 connections ≤ 5 / Not achieved (16)	Total complaints per 1,000 connections ≤ 5	Total complaints per 1,000 connections ≤ 15	Total complaints per 1,000 connections ≤ 15	Total complaints per 1,000 connections ≤ 10	Total complaints per 1,000 connections ≤ 10

Figure 1.5: Performance Measures

1.5.2 Resident Satisfaction Surveys

The 2017 Resident satisfaction Survey identified that, overall, 94% of respondents connected to a community wastewater scheme were satisfied (compared with 96% in 2016). Reasons for dissatisfaction related to overflows, blockages, odours and smells.

1.6 FUTURE DEMAND

The main drivers of demand in wastewater are:

- Land use activities (e.g. industrial trade wastes, tourism and coastal settlements)
- Population growth
- 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.

The impacts of climate change may influence demand for wastewater services due to the frequency of intensive rainfall conditions. This may impact on the capacity of the reticulation networks and treatment plants due to the high levels of inflow from urban areas not serviced with stormwater, and infiltration levels over winter months.

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 wastewater assets at Waitomo Village are privately owned and operated, and do not form part of this AMP. The option of the Village wastewater (and 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 wastewater services over the next 30 years will be:

- Future maintenance and renewals costs associated with the wastewater 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 discharge consents will increase service costs.

- Modest provision has been made over the term of this AMP for additional wastewater infrastructure at the Te Kuiti WWTP and Te Waitere soakage field to support future growth planning.
- Investigation of options for a proposed Mokau and Awakino wastewater scheme has been provided.
- Potential demand for WDC ownership/management of the Waitomo Village wastewater (and water supply) scheme (but not forming part of this AMP).

1.7 LIFE CYCLE ASSET MANAGEMENT

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

Apart from the current issues listed earlier in this document, the following asset management planning approaches are noted for each scheme:

1.7.1 Te Kuiti

- Te Kuiti has a totally pumped wastewater system therefore energy is a significant cost component.
- 77% of the reticulation has a remaining design life in excess of 20 years, with 68% having a remaining life of less than 60 years.
- The age and high proportions of AC and GEW pipe material types will impact on renewal programmes during the 2018 – 2028 and subsequent planning periods.
- The reticulation has a high inflow/infiltration issue which causes occasional problems
- In extreme rain fall events inflow/infiltration can strain the treatment process and may cause breaches of the consented discharge volumes.
- The cost of reducing inflow and infiltration to manageable levels is estimated to be significant and a set amount of $100,000 annually is allocated to progressively solve this problem.
- A new discharge consent was issued in early 2015 for a term of 25 years.
- The upgrade to the treatment plant included improvements to operating systems, a stormwater inflow bypass pipeline and treatment/storage, plus reconfiguration of the aerobic/anaerobic treatment ponds and provision for tertiary treatment and sludge. management at a cost of $9.3m, including design costs was completed by June 2013.
- The upgrade provides a flexible operating environment that meets the agreed new consent conditions.
- Sewers due for renewal during the next 10 years have been programmed to smooth expenditure.
- The estimated cost of the required reticulation renewals for the Te Kuiti scheme over the next ten years (2018 – 2028) is about $1.2M

1.7.2 Benneydale

- The existing wastewater treatment plant was rehabilitated in 2009-10 which improved the quality of the discharge effluent significantly.
- A seasonal (summer) land disposal system was constructed in 2011 to bring the water quality of the Mangapehi Stream to recreational use standard during summer.
- The old reticulation of 1894m has been extended by 265m and all the properties that could be economically serviced are connected to the waste water system.
- The optimised replacement cost of the reticulation in Benneydale is $418,000. The remaining useful life of the old reticulation according to asset information held is 2 years. Investigation was completed in mid-2011 and it was concluded that some repair work is required over the next 3 years which would allow the life of the old reticulation to be extended to by about 20 years.

1.7.3 Te Waitere

- Reticulation is only available to a limited number of properties.
- A new discharge consent was obtained for the scheme in 2017, expiring 2042
- The perception is that extension of the system will require additional land to extend the land disposal area.
- Such work would require new, probably modified discharge consent with more stringent discharge conditions, land use activities as well as other components of the basic system.
- Initial investigation showed that the surface layer of the land on some parts of the peninsula is moving.
- Further expansion/development was put on hold until a full geotechnical investigation to establish land stability had been done. This will probably only happen in the period beyond 2018-2028
- Expansion of the network may require secondary and probably tertiary treatment capacity to be introduced. The new consent contains a trigger at which point a review of disposal options is to be carried out when scheme demand exceeds the equivalent of 20 residential properties.

1.7.4 Piopio

- The Piopio waste water system was fully commissioned by end 2012.
- Future development in excess of the spare capacity of about 32 equivalent units will necessitate expansion of the whole system at Piopio.
- Alternatively, a more feasible option might be to construct an additional new plant on a separate or adjacent site to a design capacity of 180 additional residential equivalent units.

1.7.5 Other Areas

- There is a possibility of implementing future schemes at other townships within Waitomo District, particularly in the coastal communities where growth is partly impeded by the lack of appropriate wastewater infrastructure.

- Mokau, Awakino and Marokopa do not have public sewerage schemes. It is proposed that a scheme be investigated for Mokau - Awakino to a concept stage. The projected timetable for this work would commence with a concept design in 2030-32 followed by detailed design and construction in the following years subject to budget approval. The preliminary estimated cost of the proposed scheme is around $17 million.

- The wastewater scheme at Waitomo village is privately owned and operated, and does not form part of this AMP.

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 wastewater activity, e.g. power supply failures, material supply failures.
- Physical failure risks, where condition, performance of the asset or third party 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.

1.9 FINANCIAL SUMMARY

The provisional 2018-48 AMP financial forecast for the wastewater activity was determined by identifying new works, and the continuation/revision of current maintenance and renewal strategies for each of the components, i.e. reticulation networks, pump stations, treatment plants, based on current levels of service. The expenditure forecast for first 10 years of the AMP, corresponding to the 2018-28 LTP, is summarised in the following tables:

Trend	Project	Key Service Criteria	Forecasted Total Cost	Confidence Level in Projections	Estimated Timeline for Project Completion
Maintenance	Treatment Plant	Legislative Health & Safety	$13,000 18/19 $13,325 19/20 $13,624 20/21 $13,949 21/22 $14,287 22/23 $14,651 23/24 $15,051 24/25 $15,418 25/26 $15,847 26/27 $16,289 27/28	C	2018-2028

Figure 1.7: Key Programmes to Maintain and Achieve Levels of Service

Key Strategies Impacting on Future Levels of Service

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

Figure 1.8: 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
Maintenance	WWTP Aeration System	Legislative Health & Safety	$60,000 18/19 $25,625 19/20 $26,200 20/21 $64,380 21/22	C	2018-2022
Maintenance	River Crossing Augmentation	Legislative Health & Safety	$125,760 20/21	C	2020-2021
Maintenance	Investigation, Design & Specification	Legislative Health & Safety	$9,000 18/19 $3,588 19/20	C	2018-2020

Future Demand

The key issues impacting on demand forecasts for Wastewater 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

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

Figure 1.9: Capital Programmes to Meet Growth and Demand

Trend	Project	Key Service Criteria	Forecasted Total Cost	Confidence Level In Projections	Estimated Timeline for Project Completion
Maintenance	Piopio SCADA Improvements	Health and Safety	$10,250 19/20 $10,480 20/21 $10,730 21/22 $10,990 22/23 $11,270 23/24	C	2019-2024
Maintenance	WWTP Bulk Lime Silo	Legislative Health & Safety	$105,000 18/19	C	2018-2019

Figure 1.10: Renewal Programmes

Project	Key Service Criteria	Forecasted Total Cost	Confidence Level In Projections	Estimated Timeline for Project Completion
RC Vegatation	Environmental Legislation	$15,000 18/19 $15,375 19/20	C	2018-2020
Bennydale Sewerage Renewals	Environmental Legislation	$39,800 18/19 $40,795 19/20	C	2018-2020
Reticulation Renewal – Minor	Health & Safety Environment Legislation	$41,000 18/19 $42,025 19/20 $42,968 20/21 $43,993 21/22 $45,059 22/23 $46,207 23/24 $47,355 24/25 $48,626 25/26 $49,979 26/27 $51,373 27/28	C	2018-2028
Treatment Plant Renewal – Minor (Te Kuiti)	Health & Safety Environment Legislation	$45,000 18/19 $46,125 19/20 $47,160 20/21 $48,285 21/22 $49,445 22/23 $50,715 23/24	C	2018-2024
Te Kuiti Sewer Renewals	Health & Safety Environment Legislation	$280,000 18/19 $293,440 19/20 $300,440 20/21 $307,720 21/22 $315,560 22/23 $184,800 23/24 $189,760 24/25 $195,040 25/26 $200,480 26/27	C	2018-2028
Unplanned Pump Renewals	Health & Safety Environment Legislation	$6,400 18/19 $6,560 19/20 $6,707 20/21 $6,867 21/22 $7,034 22/23 $7,213 23/24 $7,392 24/25 $7,590 25/26 $7,802 26/27 $8,019 27/28	C	2018/2028
Pump Station Renewals	Health & Safety Environment Legislation	$17,000 18/19 $17,425 19/20 $17,816 20/21 $18,241 21/22 $18,683 22/23 $19,159 23/24	C	2018-2028

Project	Key Service Criteria	Forecasted Total Cost	Confidence Level In Projections	Estimated Timeline for Project Completion
		$19,635 24/25 $20,162 25/26 $20,723 26/27 $21,301 27/28		
Renew and Extend Soakage Field	Environment Health & Safety Legislation	$15,375 19/20 $26,200 20/21	C	2019-2021
Treatment Plant Renewal Minor (Bennydale)	Health & Safety Environment Legislation	$12,500 18/19 $12,813 19/20 $13,100 20/21 $13,413 21/22 $13,738 22/23 $14,088 23/24 $14,438 24/25 $14,825 25/26 $15,238 26/27 $15,663 27/28	C	2018-2028

Wastewater operational, renewal and capital costs for the 10 year LTP period 2018-28

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											
Waitomo Sewerage	0	0	0	0	0	0	0	0	0	0	0
Te Kuiti Sewerage	(860,000)	(850,000)	(871,250)	(864,600)	(858,400)	(879,200)	(901,600)	(924,000)	(948,800)	(975,200)	(1,002,400)
Te Waitere Sewerage	0	0	0	0	0	0	0	0	0	0	0
Benneydale Sewerage	(1,200)	(1,000)	(1,025)	(1,048)	(1,073)	(1,099)	(1,127)	(1,155)	(1,186)	(1,219)	(1,253)
Piopio Sewerage	(1,600)	(8,800)	(9,020)	(9,222)	(9,442)	(9,671)	(9,918)	(10,164)	(10,437)	(10,727)	(11,026)
	(862,800)	**(859,800)**	**(881,295)**	**(874,870)**	**(868,915)**	**(889,970)**	**(912,645)**	**(935,319)**	**(960,423)**	**(987,146)**	**(1,014,679)**
Direct Expenditure											
Waitomo Sewerage	0	5,000	5,125	5,240	0	0	0	0	0	0	0
Te Kuiti Sewerage	1,548,905	1,460,044	1,488,247	1,553,322	1,573,203	1,632,791	1,651,322	1,679,786	1,725,812	1,828,562	1,843,685
Te Waitere Sewerage	39,665	40,508	41,708	42,869	43,323	44,641	46,432	47,266	48,625	49,907	50,680
Benneydale Sewerage	118,272	107,736	110,751	113,620	115,359	118,612	122,751	125,255	128,771	132,234	134,864
Piopio Sewerage	159,978	147,484	151,579	155,468	157,942	162,351	167,909	154,061	158,393	162,646	165,838
	1,866,820	**1,760,772**	**1,797,409**	**1,870,519**	**1,889,827**	**1,958,395**	**1,988,414**	**2,006,367**	**2,061,601**	**2,173,349**	**2,195,067**
Indirect Expenditure											
Allocated Costs	237,506	212,149	219,129	222,388	227,272	234,165	244,118	251,702	258,310	261,174	267,478
Depreciation	780,795	777,842	795,696	810,205	824,575	839,845	850,088	861,615	869,251	876,141	883,222
Interest	524,739	480,588	498,917	504,538	510,657	545,449	534,337	512,751	475,602	434,598	390,084
	1,543,040	**1,470,579**	**1,513,742**	**1,537,130**	**1,562,503**	**1,619,459**	**1,628,543**	**1,626,068**	**1,603,163**	**1,571,913**	**1,540,784**
Net Cost of Service	**2,547,060**	**2,371,551**	**2,429,856**	**2,532,778**	**2,583,415**	**2,687,884**	**2,704,313**	**2,697,116**	**2,704,342**	**2,758,115**	**2,721,172**
Capital Expenditure											
Waitomo Sewerage	0	0	0	0	0	0	0	0	0	0	0
Te Kuiti	535,857	622,121	488,034	605,308	528,475	475,276	487,303	308,775	316,986	325,733	334,729

Sewerage											
Te Waitere Sewerage	0	0	15,375	26,200	0	0	0	0	0	0	0
Benneydale Sewerage	52,312	52,300	53,608	13,100	13,413	13,738	14,088	37,538	14,825	15,238	15,663
Piopio Sewerage	30,928	19,400	30,135	30,811	31,546	32,311	33,134	22,407	23,008	23,649	49,368
	619,097	**693,821**	**587,151**	**675,419**	**573,434**	**521,324**	**534,524**	**368,719**	**354,819**	**364,620**	**399,760**
Net Expenditure	**3,166,157**	**3,065,372**	**3,017,008**	**3,208,198**	**3,156,849**	**3,209,208**	**3,238,837**	**3,065,836**	**3,059,161**	**3,122,735**	**3,120,932**
Funded By											
Reserves	(541,007)	62,300	20,758	2,649	130,041	(31,048)	(32,221)	(41,944)	(9,833)	1,114	(14,031)
Internal Loans	(210,517)	(622,121)	(488,034)	(605,308)	(528,475)	(475,276)	(487,303)	(308,775)	(316,986)	(325,733)	(334,729)
Total Rates	(2,414,633)	(2,505,551)	(2,549,731)	(2,605,538)	(2,758,415)	(2,702,884)	(2,719,313)	(2,715,116)	(2,732,342)	(2,798,115)	(2,772,172)
	(3,166,157)	**(3,065,372)**	**(3,017,008)**	**(3,208,198)**	**(3,156,849)**	**(3,209,208)**	**(3,238,837)**	**(3,065,836)**	**(3,059,161)**	**(3,122,735)**	**(3,120,932)**

Figure 1.11: Wastewater operational, renewal and capital costs for the 10 year LTP period 2018-28 (inflated figures)

The strategy for this forecast was to:

- Assign realistic timing to projects given the resources available under Council'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
- Reduce the backlog of currently approved but uncompleted works.

In summary, the overall wastewater forecast for the next 10 years proposes:

- Operational and maintenance costs increase steadily across all schemes in line with inflation adjustments.
- Renewal costs fluctuate between schemes with non–operational expenditure smoothing applied in all cases to avoid major spikes in overall expenditure for each scheme from one year to the next.
- Major renewals expenditure in Te Kuiti due to poor pipe condition leading to high inflow/infiltration may be required. The work planned for detailed surveys of the reticulation will confirm the scope and cost estimate of the work required.
- No other capital works expenditure is included in the programme.

1.10 ASSUMPTIONS

The following basic assumptions have been made in preparing 30 year funding requirement forecasts:

- All expenditure is stated in dollar values as at 30 June 2018 with no allowance made for inflation over each subsequent year of the 30 year planning period
- Operational cost will increase with upgraded plants due to higher levels of final effluent quality required
- It is anticipated that there will be a gradual increase in operation and maintenance expenditure in real terms over the planned period due to more stringent consent compliance requirements and the continued ageing of the asset. A small part may be offset by improved asset management decision making, made possible by enhanced information used in asset management systems.
- Programmed renewal works are expected to result in a delayed increase in cost of maintenance over time. As this possible reduction is difficult to quantify it has not been allowed for in the financial forecasts.
- Maintenance allocations are largely based on maintaining current levels of service including compliance with current resource consents.
- Significant increases in renewal funding may result from more detailed evaluation of asset condition. No allowance for that gas been made in the expenditure forecast

These projections 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.

1.11 FUNDING OF ACTIVITY

The current funding options available for the Wastewater Activity include:

- Rates
- Fees and trade wastes charges
- Development contributions (currently WDC does not have a development contributions policy)
- Financial contributions
- Capital contributions (e.g. from past subdivisions pre LGA 2002)
- Special funds – reserves, investment funds, etc
- Loan finance

Tourism related demand expenditure on wastewater infrastructure is potentially eligible for capital funding assistance from Central Government's Tourism Infrastructure Fund (2017).

1.12 AMP IMPROVEMENT PROGRAMME

An improvement plan that outlines steps required to improve the quality of both the content and presentation of this AMP document is included as Section 0 (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.
- Ensure the right level of funding is being allocated to maintain the asset service potential.
- Formalise asset data collection and recording procedures and focus on improved assessment of asset condition and remaining useful lives
- Improve contractor maintenance reporting
- Continue the long term infiltration and inflow investigation and reduction programme, initially for Te Kuiti.
- Improve accuracy and completeness of assets registers for each scheme.
- Develop a greater focus on risk identification and management, obtaining more detailed information on critical assets and prioritise identified risk mitigation works.
- Monitor and enforce agreements made under the Trade Waste Bylaw for the Te Kuiti scheme

SECTION 2 - INTRODUCTION

2.1 WAITOMO DISTRICT

The 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 3,363.57 km^2 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. Major industrial users of wastewater infrastructure include two abattoirs based in Te Kuiti, and a local hospital.

2.2 PURPOSE OF AM PLANNING

Council is responsible for the management of three urban wastewater schemes which have an optimised replacement value of approximately $37.4M (30 June 2015).

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

This Asset Management Plan (AMP) combines 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 plan is intended to demonstrate to the district's ratepayers that Council is managing their assets responsibly and to an optimised price/quality trade-off from alternative levels of service.

2.3 BENEFITS OF ASSET 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 ASSET MANAGEMENT PLAN

AM plans are a key component of the Council's planning process, 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.

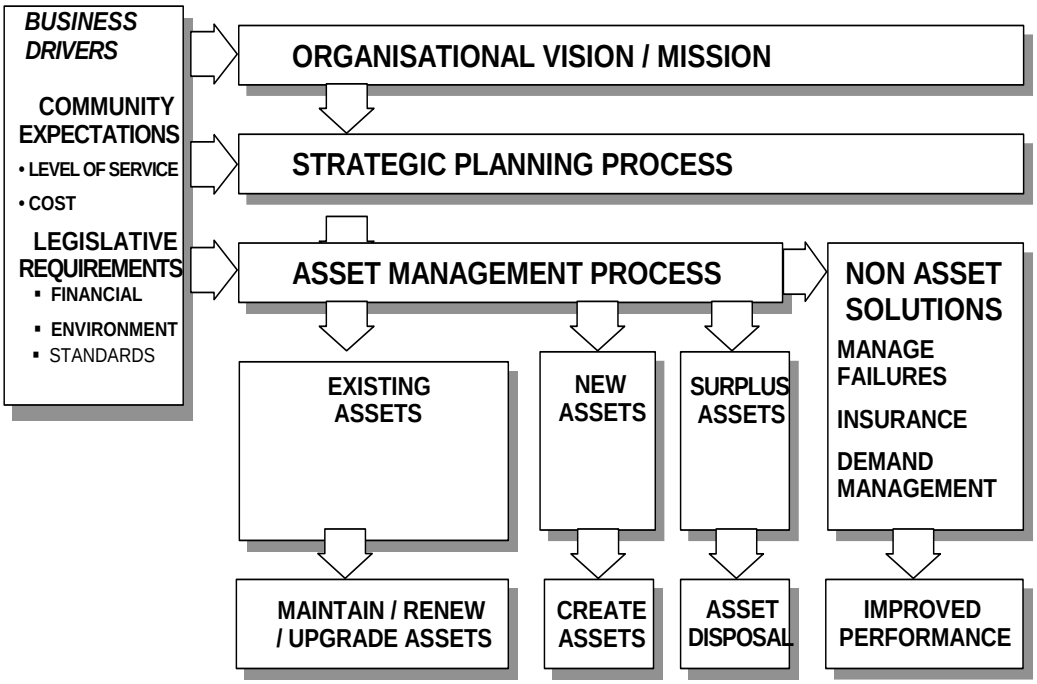


Figure 2.1: Asset Management Plan Process

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

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

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. The project was coordinated and quality managed internally and 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 sustainable and met in the most effective and timely manner. A program of AM improvement (see Section 0) 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 AMP in a logical manner as follows:

Section Number	Section Title	Description
1	Executive 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 stormwater 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 roads and footpaths 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 WASTEWATER ACTIVITY

This AMP applies to the following four community wastewater schemes:

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

3.2 SCOPE OF ASSETS

The wastewater asset components include the reticulation network, pumping stations, treatment plants and effluent disposal systems, summarised as follows:

Asset Type	Quantity
Sewage treatment plants	4
Wastewater reticulation	65,017m
No. of manholes	771
Pumping stations	7 (including Te Kuiti main Pump Station)

Figure 3.1: Asset Type

The combined optimised replacement costs of the four schemes is $37,406,732.

Taharoa 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.

3.3 MANAGEMENT STRUCTURE

The WDC Assets Group manages the water supply activity. The organisational structure is illustrated in APPENDIX **Error! Reference source not found.**.

3.4 PHYSICAL WORKS & PROFESSIONAL SERVICES DELIVERY

WDC contracts out all non-routine maintenance, renewal and new wastewater 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 ENVIRONMENTAL RESPONSIBILITY

Council is required under the provisions of the Resource Management Act to provide wastewater services in an environmentally responsible manner. This AM plan demonstrates how Council is addressing sustainable management of its physical resources and environmental protection issues associated with the maintenance and development of its wastewater assets.

3.6 SAFETY

Asset management planning addresses Council's Health and Safety at Work obligations through the:

- Adoption of a Health and Safety policy

- Identification of work place hazards at each site
- Adoption of appropriate safety standards for the creation, maintenance and renewal of SW assets.
- Specification of works to maintain assets in a safe condition.
- Enforcement of safe operating and work practices.
- Compliance with industry standards and health and safety codes of practice.

3.7 ECONOMIC EFFICIENCY

Council manages the urban stormwater infrastructure on behalf of the affected district ratepayers.

The techniques of asset management support economic efficiency by:

- Providing a basis for monitoring asset performance and utilisation
- Enabling asset managers to anticipate, plan and prioritise asset maintenance and renewal works
- Identifying under funding of asset maintenance and replacement
- Quantifying risk, minimising high impact (financial and service level) failures and environmental effects, resulting in savings where asset renovation is less than for replacement
- Extending the life of an asset by optimising maintenance and refurbishment treatment selection.

3.8 CORPORATE PROFILE

Council aims to be a customer focused organisation and a good corporate citizen. Effective stormwater asset management planning reflects this corporate aim.

3.9 SIGNIFICANT NEGATIVE EFFECTS OF PROVIDING THE WASTEWATER ACTIVITY

Wellbeing	Positive Effects	Negative Effects
Social	Maintaining / improving health and wellbeing through the provision of an effective wastewater collection, treatment and disposal system	Malodour from pumping stations and treatment plants can impact on quality of life and amenity.
Environmental	Robust wastewater planning, design and operation avoids adverse effects on the environment and efficient recycling of natural resources	Sewage overflows from pumping stations or blocked sewers and impacts of the final effluent quality at the point of discharge have the potential for negative impact on the environment
Economic	Provides means for the disposal of trade wastes	Cost of compliance with applicable standards. Cost of sewerage rates and fees can be a significant burden for local industry
Cultural	An effective wastewater system helps to facilitate traditional community gatherings and events	Discharges from wastewater treatment plants can have a damaging effect on both the physical and cultural attributes of the receiving environment

Figure 3.2 Effects of Wastewater Activity

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 Wastewater Activity supports this vision by:

a. Maintaining and improving the wastewater reticulation collection system to maintain a healthy living environment
b. Operating the treatment plants in accordance with discharge consent requirements to help preserve the natural environment for future generations

4.2 COMMUNITY OUTCOMES

The Wastewater 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.

4.3 STRATEGIC GOALS FOR THE GROUP

- Wastewater is managed to preserve and protect the natural environment
- To meet the Community's needs by ensuring public health, social well-being and providing for economic growth

4.4 RATIONALE FOR COUNCIL INVOLVEMENT

This Activity exists to ensure that the natural environment is protected from detrimental effects of sewage, and that the wastewater management needs of the District community are met.

The rationale for Council's involvement stems in part from statutory requirements. The legal authority for Council to be involved in the provision of wastewater 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 wastewater 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 wastewater activity, and this AMP has been developed on this basis. The vision that Council is working to achieve is set out in the community outcomes adopted for the District. The wastewater activity is generally regarded as an essential activity associated with protecting public health and the environment.

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 wastewater activity. Political decisions on these strategic issues involve the scope, standard, cost, delivery and funding of services.

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

- Core Business - Council accepts responsibility for providing essential services. These services include wastewater
- Natural monopoly - Council is empowered by the LG Act 2002 to provide wastewater 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
- 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 community wastewater services 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

WDC is the primary service provider for the construction, maintenance and repair of the community wastewater systems within Waitomo District and may maintain the District's wastewater systems as it sees fit, subject to decisions on appropriate levels of service, central government and regional council requirements, and ratepayer willingness to fund the activity costs.

The Activity comprises a number of elements including pipes, pumping stations and treatment plants. Council oversees this responsibility by managing, coordinating and contracting physical works to internal and external organisations.

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 wastewater 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 wastewater operations.

4.8 COUNCIL BYLAWS

WDC operates a 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, storm water 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 storm water 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 storm water drainage assets and the health and safety of employees
- Set out acceptable types of connection to public water services, sewerage and storm water 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 WDC's wastewater 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 wastewater maintenance contractor
- Waikato Regional Council
- Ministry of Health
- Ministry for the Environment
- Fish and Game
- Ngati Maniapoto
- Residential, commercial and industrial ratepayers

Internal

- Councilors

- Chief Executive
- General Manager - Infrastructure Services
- Manager – Water Services
- Wastewater treatment plant operators
- Finance Manager
- Group Manager – Corporate Services
- Group Manager - Compliance
- Information Services 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 wastewater 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 boundaries for utility services. It establishes standards for the construction and protection of the wastewater 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 have therefore been added to include indicative values for a 30-year term in keeping with the statutory term of the Infrastructure Strategy. The Wastewater AMP informs the content of WDC's Infrastructure Strategy by considering levels of service, future demand, life cycle asset management programs 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 Wastewater AMP has synergies with a number of other Council AMPs. For example, the water supply activity is pivotal in providing the liquid medium for conveying sewage through the wastewater network following human and industrial water consumption. Similarly, the roading network provides a corridor for hosting many underground infrastructural services such as the wastewater reticulation, and the storm water network helps to prevent surface water entering the wastewater network.

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 discharge 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 wastewater services.

The operative District Plan establishes zones for residential (and other) development. The minimum lot size for a residential property connected to a reticulated sewerage scheme is defined by minimum yard separation distances and maximum building site coverage of 35%. Without sewerage, a larger minimum lot size of 2500m2 is required. With reticulated sewerage, the minimum lot size reduces to 600m2 in a greenfield development, or 300m2 in an infill development. No similar limitation on lot size is specified where reticulated stormwater drainage is not available.

4.11 ASSET MANAGEMENT POLICY & STRATEGY

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

- Optimise 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	REFERENCES	PROGRAMME IMPLICATIONS	COMMUNITY OUTCOME LINKAGE
Te Kuiti	Resource consent expiry date within term of AMP.	Consent expires 30 Jan 2040	Clause 0	The next consent application will need to be lodged with Waikato regional Council no later than 1 July 2039. Additional operating budget for technical advice and consultation in support of the application will be required over 2038 – 39. Budget estimate $500,000.	Vibrant communities.
	Capacity limits	Avg. 4,000 m3/d. Peak 7,000 m3/d.	Clause 0	Upgraded power supply capacity required to increase plant clarifier and reactor capacity.	Sustainable infrastructure
	Treatment plant O & M costs	Sludge processing, chemical dosing and mechanical and electrical maintenance require higher levels of expenditure	Clause 0	Additional $30,000 p.a. O & M budgets for chemical dosing, from 2018/19	Sustainable infrastructure.
	High inflow and infiltration	Significant inflow and infiltration during wet conditions (approx. 5,000 m^3 per day), on top of the average dry-weather flow of approx. 2,850 m^3 per day, points to deterioration of reticulation condition within the network.	Clause 0 Clause 0	On-going maintenance and renewal budgets will be required to repair/replace ageing mains, in accordance with the AMP renewal strategy.	Sustainable infrastructure.
Benneydale	Resource consent expiry date within term of 2018-28 LTP.	Consent expires 1 May 2025.	Clause 5.2.5. Clause 0.	Budget provision of $20,000 in 2024/25 for consent renewal.	Vibrant communities.
	Future renewal costs	A recent asset condition assessment has identified, however, that there is a least 15	Clause 0	Renewal strategy reflects remaining life of network – no replacements expected before 2035.	Sustainable infrastructure

SCHEME	ISSUE	EVIDENCE	REFERENCES	PROGRAMME IMPLICATIONS	COMMUNITY OUTCOME LINKAGE
		years of remaining life available.			
Te Waitere	Resource consent expiry date within term of AMP	Consent expires 31 July 2042.	Clause 5.2.5.	The next consent application will need to be lodged with Waikato regional Council no later than 31 January 2042. Additional operating budget for technical advice and consultation in support of the application will be required in 2041/42. Budget estimate $20,000.	Vibrant communities.
	Capacity limitation	Current capacity is limited to the design flow from the equivalent of 12 dwellings. Currently there are 11 dwellings connected, with discharge volumes well below this level, mainly because of the high incidence of absentee owners.	Clause 0	Provision is recommended for investigation of alternative or enhanced effluent disposal capacity. Budget estimate $15,000 in 2019/20 for investigations, plus $25,000 in 2020/21 for new construction/rehabilitation of soakage field on existing site.	Sustainable infrastructure.
	Renewals	Most of the reticulation has been replaced over the past three years, including the rising main. Replacement of the soakage field with an expanded facility is likely over the next few years.	Clause 0.	See investigations proposed above.	Sustainable infrastructure.
Piopio	Resource consent expiry date within term of 2018-28 LTP.	Consent expires 30 June 2028.	Clause 5.2.5 Clause 0	$20,000 in 2027/28	Vibrant communities.
	Capacity limits	Capacity: Avg. 135.4 m^3/d.	Clause 0 Clause 0	An increase in the frequency of pumping of private septic tanks, and	Sustainable infrastructure.

SCHEME	ISSUE	EVIDENCE	REFERENCES	PROGRAMME IMPLICATIONS	COMMUNITY OUTCOME LINKAGE
		Peak 6 L/s (1,050 m^3/d). Current maximum discharge (2017): Avg. 86.2 m^3/d. Peak. 305 m^3/d. Spare capacity for an additional 23 residential units.		increased tank sizes, as a result of actual operating experience since implementation. An increase in preventative maintenance to avoid pipe blockages is required. Future development in excess of the spare capacity will necessitate expansion of the whole system at Piopio. The options include extending the capacity of the existing site by adding the maximum number of treatment modules to give capacity for 50 more dwellings. A rough order of cost of this option is $2.7M plus GST. It includes provision for a consent variation to increase the discharge volume, and allowance for possible land disposal, given the small but determined level of opposition to the current riverine discharge consent. An alternative and perhaps more feasible option might be to construct an additional new plant on a separate or adjacent site to a design capacity of 180 additional residential equivalent units. The land and treatment plant would be sized for a combined capacity of 500 residential equivalent units (persons). The estimated cost of this option, including land disposal ($2M), is $5M plus GST.	
	Additional routine maintenance costs.	High incidence of system blockages, in part due to inappropriate waste types (e.g. fat and grease) entering reticulation	Clause 0	Maintenance budget of $12K pa proposed for full routine maintenance programme.	Vibrant communities.

SCHEME	ISSUE	EVIDENCE	REFERENCES	PROGRAMME IMPLICATIONS	COMMUNITY OUTCOME LINKAGE
	Easements	Sections of reticulation are located on private land and will require easements to formalise access requirements	Clause 0	$105,000 provided over seven years to address easement documentation.	Sustainable infrastructure
	SCADA	WWTP is not fitted with SCADA for remote monitoring and control of system.	Clause 0	Budget proposed for $50K spread over 5 years.	Vibrant communities.

Figure 4.1: Strategic Assessment

SECTION 5 - LEVELS OF SERVICE

5.1 INTRODUCTION TO LEVELS OF SERVICE

The statutory background against which wastewater services are delivered goes beyond simply enabling the Council to provide and maintain those services. Either directly (e.g. the Resource Management Act) or indirectly (e.g. through consultation required with key organisations under the Resource Management Act 2001), statutory processes can impose minimum levels of service beyond those identified by the community. The ensuing cost of compliance with statute and regulation (e.g. Health and Safety at Work Act requirements) is transferred back to the ratepayer through contract payments at the time of wastewater infrastructure construction and maintenance.

Levels of service are defined in the NAM's International Infrastructure Management Manual as the identified service quality for a particular activity or service area (e.g. treatment) against which service performance may be measured. Service levels usually relate to quality, quantity, reliability, responsiveness, environmental, acceptability and cost.

An objective of AM planning is to match the level of service provided by the asset with the expectations of customers. AM planning will enable the relationship between level of service and cost of service (the price/quality relationship) to be determined. This relationship can then be evaluated in consultation with customers to determine the optimum level of service they are prepared to pay for.

Defined levels of service can then be used to:

- Inform customers of the proposed type and level of service to be offered.
- Develop AM strategies to deliver the required level of service.
- Measure performance against these defined levels of service.
- Identify the costs and benefits of the services offered.
- Enable customers to assess suitability, affordability and equity of the services offered.

5.2 LEVELS OF SERVICE DRIVERS

The following LoS drivers define the need for, and scope of, all services provided by the activity:

5.2.1 Statutory and Regulatory Requirements

Statutory requirements set the minimum standards of service which the wastewater activity has to meet and are generally not negotiable. The relevant legal requirements include:

- Local Government Act 2002
- Resource Management Act 1991
- Health Act 1956
- Health and Safety at Work Act 2015
- Building Act 2004
- Council Bylaws and Policies

<u>Local Government Act 2002</u>

- The Act empowers Council with a 'general power of competence" which encompasses the power to create, operate and maintain assets for the purpose of (inter alia) wastewater supply. The following sections further specify the powers and responsibilities of Council with respect to wastewater services:
- Section 125 requires that Council undertake an assessment from time to time of water and other sanitary services within its district. This AMP is consistent with the findings of that assessment – no additional urban SW drainage is proposed beyond maintaining current levels of service, in real terms (e.g. as a result of the imp[act of climate change on current system capacity). Given the projection of static to declining population in the district over the next 30-years, the next assessment is scheduled for 2020.
- Section 130 establishes the obligation for Council to continue to maintain wastewater services
- Sections 131-135 provide for the closure or transfer of small wastewater services

- Section 136 provides for the contracting out of wastewater services
- Section 137 provides for joint local government arrangements and joint arrangements with other parties for the delivery of wastewater services
- Section 181 empowers Council to construct work on private land that it considers necessary for (inter alia) reticulated sewerage.
- 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'.

Resource Management Act 1991
The Act requires Council to manage the use, development and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural well-being and for their health and safety while:

- Sustaining the potential of natural and physical resources to meet the reasonable foreseeable needs of future generations.
- Avoiding, remedying or mitigating any adverse effect of activities on the environment.
- Safeguarding the life-supporting capacity of air, water, soil and ecosystems.

In managing the use, development, and protection of natural and physical resources Council must:

- recognise the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu and other taonga and comply with.
- take into account the principles of the Treaty of Waitangi in exercising functions and powers under the Act relating to the use, development, and protection of natural and physical resources.
- comply with planning documents prepared under the Resource Management Act that impact on the management of wastewater assets, which include the Regional Plan prepared by the Waikato Regional Council (refer to Appendices 6,7 and 8) and Council's District Plan and Water Bylaw.
- comply with discharge consents issued by the Waikato Regional Council for disposal of treated effluent, disposal of bio solids and sludges to land, and discharge to air.

Health Act 1956
The Act requires:

- Local Authorities to provide 'sanitary works', the definition of which includes waterworks, drainage works, wastewater works, works for collection and disposal of refuse, cemeteries and crematoria and includes all lands, buildings, machinery, reservoirs, dams, tanks, pipes and appliances used in connection with any such works.
- Empowers the Minister to require local authorities to undertake works necessary to protect public health.
- Requires provision in any dwelling house of suitable appliances for the disposal of refuse water and sufficient sanitary conveniences.
- Empowers councils to make bylaws covering conditions to be observed in the construction and approval of drains.

Health & Safety at Work Act 2015
Council must ensure the safety of the public and all workers (including contractors) when carrying out, inter alia, sewerage works.

Building Act 2004
Requires Council to ensure all buildings and facilities constructed comply with this Act, including the provision of wastewater services and fittings.

5.2.2 Council Policies and Bylaws

Policies
Council's current policies applicable to its community wastewater services include:

- Meet resource consent requirements for treatment process discharges
- Protect the environment and public health where existing systems are failing
- Minimise wastewater overflows due to blockages or pump failures
- Cost effectively operate and maintain wastewater and sewerage networks

- Provide wastewater systems to communities of more than two hundred people or where public health is at risk.
- Accept and treat trade waste discharge from industries, subject to discharge consents or bylaw
- Disposal of storm water to Council's wastewater schemes is not permitted
- Trade Waste Bylaw - Connection for discharge of non-hazardous waste water into community wastewater schemes may be permitted but a particular charge may be made in accordance with the provisions of the Council's trade waste by-law.

Council Bylaws

WDC administers its Trade Waste Bylaw (TWB) which was last reviewed in 2016. The bylaw provides regulations to support the effective management, use and protection of WDC's wastewater activities. The stated purpose of the TWB is to:

a) protect sewer pipes, pumping stations, storage tanks, biological and biochemical treatment processes, wastewater treatment plants and other related wastewater system structures, electrics and controls from damage by applying standards and loading/concentration limits for trade waste discharges prior to discharge to WDC's wastewater systems

b) protect the health and safety of any person working on WDC wastewater systems by applying standards for trade waste discharges

c) protect public health and the environment from the effect of trade waste discharges by ensuring all necessary resource consents are met

d) encourage waste minimisation, cleaner production and reduced water consumption

e) allow the Council to recover fair and reasonable costs of managing trade wastes from trade premises that discharge into the Council system by ensuring that the costs of conveying, treatment and disposal are shared fairly between trade waste and domestic dischargers proportional to volume and load.

f) assist the Council to meet relevant environmental standards

g) comply with the objectives of the New Zealand Waste Strategy.

5.2.3 Customer service

Customers require that agreed levels of wastewater maintenance, management and construction services be delivered reliably, efficiently and economically. The use of AM techniques provides the following benefits in satisfying these demands:

- Focuses on identifying and satisfying customer requirements.
- Provides the basis for customer consultation for determining level of service preferences by identifying the range and cost of service level and service delivery options
- Improves reliability of asset performance and availability of consequent services to the customer
- Enhances customer confidence that funding is being allocated in an equitable and cost effective manner and that assets are being well managed
- Improves understanding of service level options and requirements.

5.2.4 Financial Responsibility

The Local Government Act 2002 places an emphasis on the preparation of long term strategic financial planning. The Act requires Local Authorities to:

- prepare and adopt, every three years, a long term (10 years plus) financial strategy which takes into account asset creation, realisation, and loss of asset service potential
- in determining their long term financial strategy, consider all relevant information and assess the cost/benefit of options
- adopt a financial system consistent with generally accepted accounting practices.

The implementation of the optimised work programs and resulting long term financial forecasts in this AMP for the management of WDC's sewerage infrastructure is the means of complying with the above requirements.

The AMP provides justification for forward work programs and provides the ability to even out peak funding demands and account for changes in asset service potential.

5.2.5 Environmental Responsibility

Council is required under the provisions of the Resource Management Act to provide wastewater services in an environmentally responsible manner. This AMP demonstrates how Council is addressing sustainable management of its physical resources and environmental protection issues associated with the maintenance and development of wastewater assets.

The operation of each wastewater disposal scheme is formally mandated by discharge and land use consents and designations, the former summarised as follows:

Scheme	Resource consent expiry date(s)
Te Kuiti	30 Jan. 2040
Benneydale	1 May 2025
Te Waitere	31 July 2042
Piopio	30 June 2028

Figure 5.1: Resource Consent Expiry

5.2.6 Assessment of Water and Sanitary Services

Section 125 of the LGA requires all territorial authorities to undertake, from time to time, an assessment of water and sanitary services available to communities in the district. Water services include storm water drainage. 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 storm water and sewage discharges within the district. The most recent assessment was completed in 2014. This AMP is consistent with the findings of that assessment – no additional urban SW drainage is proposed beyond maintaining current levels of service, in real terms (e.g. as a result of the imp[act of climate change on current system capacity). Given the projection of static to declining population in the district over the next 30-years, the next assessment is scheduled for 2020/21.

5.2.7 Safety

Asset management planning addresses Council's safety obligations through the:

- adoption of appropriate safety standards for the creation of new assets.
- specification of works to maintain assets in a safe condition.
- enforcement of safe operating and work practices.
- compliance with industry standards and codes of practice.

5.2.8 Efficiency and Effectiveness

WDC manages community wastewater infrastructure on behalf of the affected district ratepayers. Delivery of agreed LoS needs to be carried out in a manner that can be shown to be both effective and efficient.

The techniques of asset management support economic efficiency by;

- providing a basis for monitoring asset performance and utilisation
- enabling asset managers to anticipate, plan and prioritise asset maintenance and renewal works
- identifying under-funding of asset maintenance and replacement
- quantifying risk, allowing the minimisation of high impact (financial and service level) failures and environmental effects and resulting in savings where asset renovation is less than for replacement
- extending the life of an asset by optimising maintenance and refurbishment cycles.

5.2.9 Corporate Profile

Council aims to be a customer focused organisation and a good corporate citizen. AM planning is consistent with this corporate aim.

5.3 METHODOLOGY

The first step is to identify the key service criteria for each activity from the customers perspective (the objectives of the services provided) and identify the corresponding levels of performance for key service criteria.

Asset managers then plan, implement and control both the technical or outcome related dimensions and the functional or process related dimensions of service levels. These technical and functional dimensions are not always independent of each other. In some cases high technical quality may contribute to high functional quality or vice versa.

Recognition of the differences and relationships between the technical and functional levels of service is an important part of understanding levels of service.

Typical Technical Levels of Service	Typical Customer Levels of Service
Process related – measures define how the customer receives the service	Outcome related - measures define what the customer receives in an interaction with WDC
Quality – bacteriological, nutrient levels	Intangibles
Quantity	Responsiveness
Availability	Courtesy
Legislative requirements	Assurance (knowledge, trust, confidence)
Maintainability	Empathy (understanding, individual attention)
Capacity	Cost
Reliability and performance	Safety
Environmental impacts	Comfort
Cost / affordability	Cost/affordability
Comfort	Availability
Safety	Safety
Reliability and performance	Reliability

Figure 5.2 Levels of Service

5.4 STATEMENT OF SERVICE PERFORMANCE

The following levels of service, performance measures and targets correspond to the DIA mandatory measures for the wastewater activity:

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	Sewerage System is adequate and is sufficiently maintained.	Number of complaints received in a financial year about ; • sewage odour; • sewage system faults; • sewage system blockages, and • Council's response to issues with the sewage system.	Total complaints per 1,000 connections ≤20 / Not achieved (47.5)	Total complaints per 1,000 connections ≤20	Total complaints per 1,000 connections ≤35	Total complaints per 1,000 connections ≤35	Total complaints per 1,000 connections ≤35	Total complaints per 1,000 connections ≤35
Vibrant Communities CO5 Effective Leadership CO5 Sustainable Infrastructure CO10	Environmental impacts of Sewerage systems will be managed effectively.	Compliance with the Council's resource consents for discharge from its sewerage system, measured by the number of the following: *(received by Council in a financial year)*						
		• abatement notices	Nil / Achieved (Nil)	Nil	0	0	0	0
		• infringement notices	Nil / Achieved (Nil)	Nil	0	0	0	0
		• enforcement orders	Nil / Achieved (Nil)	Nil	0	0	0	0
		• convictions received	Nil / Achieved (Nil)	Nil	0	0	0	0
Vibrant Communities CO5 Sustainable Infrastructure	Timely response and resolution for sewage overflows.	The median response times for attendance, in a year, measured from the time that the Council receives notification to the time that	≤180 minutes (3hrs) / Achieved (<2 hours)	≤180 minutes (3hrs)	≤180 minutes (3hrs)	≤180 minutes (3hrs)	≤180 minutes (3hrs)	≤180 minutes (3hrs)

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		service personnel reach the site.						
		The median response times for resolution, in a year, measured from the time that the Council receives notification to the time that service personnel confirm resolution of the blockage or other fault	≤ 540 minutes (9hrs) / Achieved (<6 hours)	≤ 540 minutes (9hrs)	≤ 540 minutes (9hrs)	≤ 540 minutes (9hrs)	≤ 540 minutes (9hrs)	≤ 540 minutes (9hrs)
Vibrant Communities CO5 Sustainable Infrastructure CO10	Provision of effective and reliable sewerage systems and service to the community.	Number of dry weather sewage overflows from the Council's sewerage system in a financial year.	Total complaints per 1,000 connections ≤ 5 / Not achieved (16)	Total complaints per 1,000 connections ≤ 5	Total complaints per 1,000 connections ≤ 15	Total complaints per 1,000 connections ≤ 15	Total complaints per 1,000 connections ≤ 10	Total complaints per 1,000 connections ≤ 10

Figure 5.3: Statement of Service Performance

5.5 TARGET LEVELS OF SERVICE

Target levels of service proposed by Council are communicated to the public and key stakeholders via its draft LTP. The formal consultation process ultimately leads to these documents being finalised and adopted, after taking account of public submissions. They are reviewed on a three yearly basis and monitored six-monthly.

The service level targets selected in the tables above are based on Council's statutory obligations, corporate goals, currently accepted industry standards and the customer expectations of levels of service as assessed from survey responses from key users and stakeholders, plus interpretation of verbal and written comments received from customers over time.

Ongoing monitoring of customer expectations will be required to ensure levels of service and the AMP remain valid.

5.6 CUSTOMER RESEARCH AND EXPECTATIONS

The key to excellence in AM planning is to clearly understand customers' needs and expectations. The methods for satisfying functional levels of service have been devised and measured using previous customer satisfaction surveys.

To date customer contact has been limited to:

- occasional public meetings
- newsletters and pamphlets
- answering customer enquiries and complaints
- an annual customer satisfaction survey

5.6.1 Residents Satisfaction Survey 2017

Responses to the 2016/17 Residents Satisfaction Survey showed that overall, 94% of respondents connected to a WDC wastewater scheme were satisfied, compared with 96% in 2016. The main reasons given for dissatisfaction related to overflows, blockages and odours.

The overall findings in relation to the wastewater service levels were generally positive with responsiveness, sufficiency of current schemes and impacts on the environment the key areas for improvement, as summarised below:

5.6.2 Gaps in levels of service

Looking to the future, the main gaps identified in the current levels of service of the wastewater schemes include the need for improved responsiveness, increased renewals of aging components, with odour control, overflow capacity and concerns about the impacts of trade wastes more distant priorities.

5.6.3 Process for addressing gaps

Identified areas for improvement can by and large be dealt with through current programs. More attention to the way services are provided (i.e. qualitative rather than quantitative improvement) appears to be the major gap in current levels of service. This includes improved responsiveness to complaints and more effective maintenance strategies once the decades of neglect has been caught up with.

It has been found that complaints about WDC's service were more often than not directly related to poor maintenance or outright neglect of the complainant's private waste water disposal system (e.g. septic tank maintenance). Considerable resource goes into identifying these private issues and solutions for them.

The relationship between agreed levels of service and customer expectations and willingness to pay are becoming extremely important to the management of the assets.

A full service delivery review would be desirable in future years across the full range of Council activities to provide a basis for comparing the relative acceptance of different levels of service with cost. It could include:

- The aspects of wastewater services most valued by customers
- The level of service appropriate for these services
- How well customers perceive Council's performance in delivering these services
- How much customers are prepared to pay for enhanced services
- The relative importance of wastewater compared with other Council services.

SECTION 6 - FUTURE DEMAND

The main drivers of demand for wastewater services are:

- Population growth
- Land use activities (e.g. industrial development, tourism and coastal settlements)
- Urban infill and expansion
- Global warming
- Community expectations e.g. environmental impacts

6.1 POPULATION GROWTH

The pattern of modest land subdivision and new dwellings in the district is reflective of a slight decline in the normally resident population of the district, across both the rural and urban areas, over the past 7 years of the 2006 – 2013 inter-census period. The exceptions are the Taharoa and Waipa Valley (east of Te Kuiti) area units where slight population gains were recorded in 2013 – both consistent with the new dwelling and subdivisional activities identified above. Of interest was nine new houses recorded at Taharoa during 2013. These were all relocated dwellings for the NZ Steel Mining company, potentially indicating an increased scale of operation at that location.

Waitomo District	Census usually resident population count			Population Change		
Area Units	2001	2006	2013	2001-2006	2006-2013	2001-2013
531500 Piopio	468	468	393	0	-75	-75
531600 Taharoa	246	216	231	-30	15	-15
531710 Mahoenui	528	480	399	-48	-81	-129
531720 Marokopa	1,569	1,572	1,536	3	-36	-33
531731 Waipa Valley	960	984	1,050	24	66	90
531732 Tiroa	72	81	51	9	-30	-21
531800 Mokauiti	1,218	1,182	1,029	-36	-153	-189
532000 Te Kuiti	4,392	4,455	4,218	63	-237	-174
619201 Inlet-Waitomo District	-	-	-			
Total Waitomo District	9,453	9,438	8,910	-15	-528	-543

Figure 6.1: WDC Population Statistics

The 2013 census, usually resident population of the district was ranked 58th out of 67 districts in New Zealand. This compares with Otorohanga District at 56th place, Ruapehu District at 52nd, and Waipa District at 21st.

The usually resident population of Waitomo District at the time of the 2013 census was 8,907.[1] This is down from the 2006 usually resident 2006 census population of 9,441.

The medium projection for New Zealand has previously indicated that the national population will rise from 4,509,700 in 2014 to 5,761,100 in 2043. All regions were projected to have more people in 2043 than in 2013, although 26 territorial authority areas were projected to have less. Waitomo District was one of those projected to have less.[2]

More recently (Dec 2016), the estimated population for the district has shown an upward trend since the 2013 census population, as illustrated in the figure below:

[1] *Statistics NZ, Census 2013*
[2] *Statistics NZ, Census 2013*

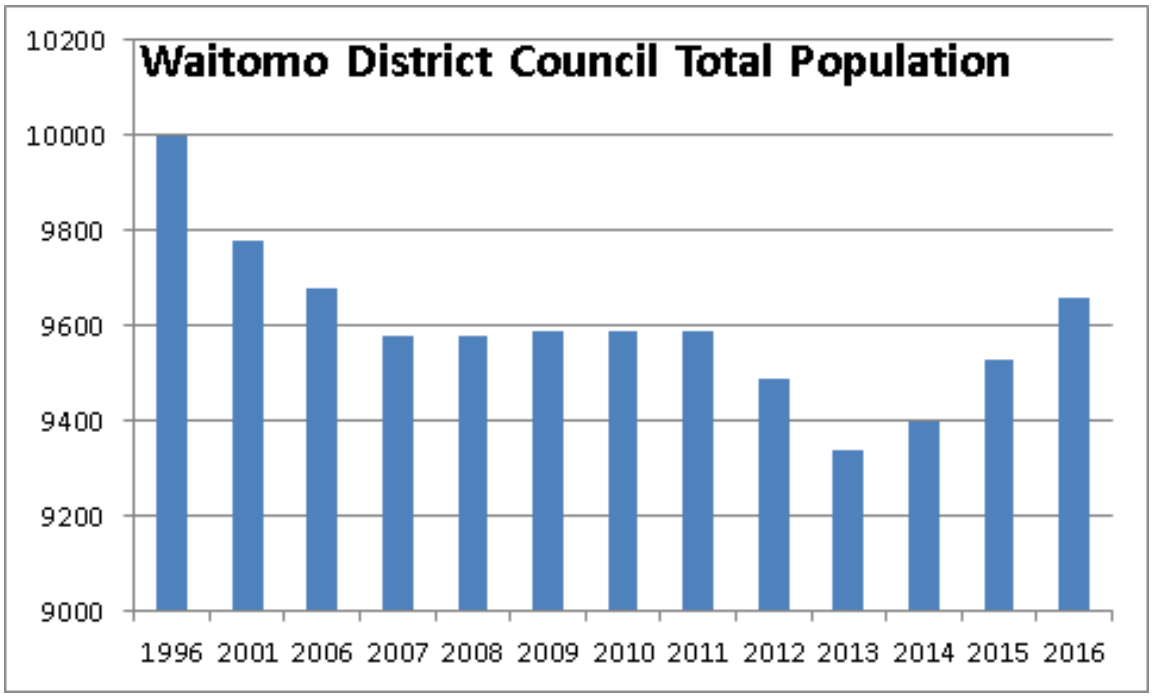
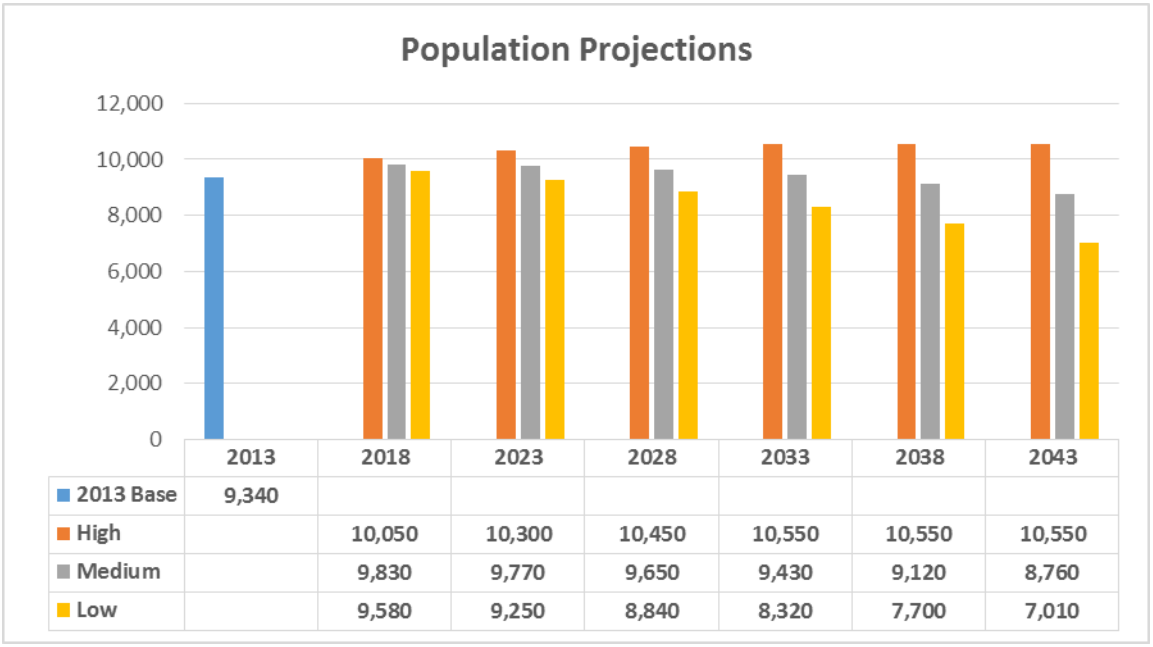


Figure 6.2: WDC Population

Further, population projections for the district over the period 2013-2043, released by Statistics New Zealand on 14 Dec 2016, mirrored the above trend. They showed positive growth in population for all scenarios over the 2013-2018 period, continuing through to 2033 then stabilising after that in the High Projection scenario, but declining after 2018 in the Medium and Low projection scenarios.



	2013	2018	2023	2028	2033	2038	2043
2013 Base	9,340						
High		10,050	10,300	10,450	10,550	10,550	10,550
Medium		9,830	9,770	9,650	9,430	9,120	8,760
Low		9,580	9,250	8,840	8,320	7,700	7,010

Figure 6.3: Population Projections

With regard to the population structure, the district has a similar age profile to the rest of New Zealand. In 2013 the proportion of people aged 20 to 44 was lower than the rest of New Zealand however the proportion of people aged below 15 was higher. The proportion of people aged over 65 is projected to increase from 13% in 2013 to over 25% in 2048 and the number of people aged between 15 and 64 years of age is projected to decrease. This will require an increasing proportion of mobility options, compounded by an increasing proportion of fixed incomes and an overall modest total

population of less than 10,000 people (medium growth scenario), resulting in significant affordability challenges for maintaining and renewing the network.

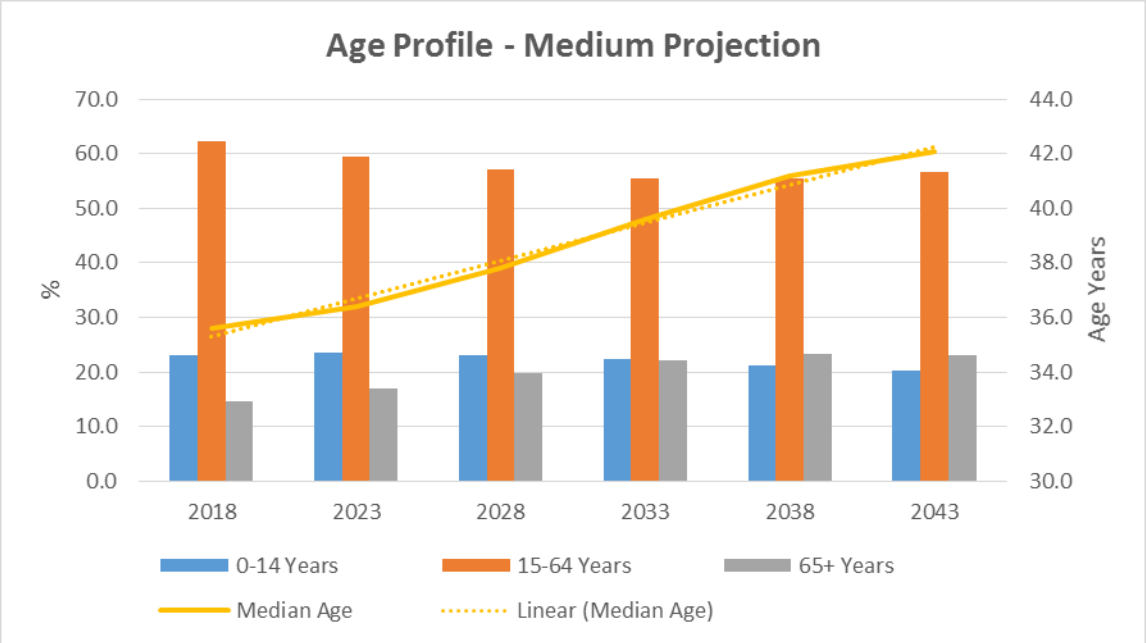


Figure 6.4: Age Profile – Projection

Three growth scenarios were developed by *Rationale* in 2017 from three baseline resident population growth rates considered appropriate for the 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 6.5: Recommended medium growth scenario

6.2 LAND USE ACTIVITIES

Urban land development and associated building construction and industrial activities, together with population change will have greatest impact on demand for reticulated wastewater services.

The growth in the number of new dwellings is underpinned by subdivisional activity. There is often a delay between new lot creation and building consents, partly due to the time involved in processing resource consents, and other external factors such as the economy and the market for new dwellings.

Further land development is to be monitored during the term of the 2018-2028 LTP in conjunction with the staged review of Council's District Plan.

The current pastoral based economy is expected to remain the economic base for the district, with growth very dependent on economic conditions and export opportunities. Industrial growth, which may impact on wastewater demand, is partly dependent on attracting new industries. At this point, there are no known new industrial developments expected to occur in urban areas during the planning period.

Tourism is a major economic activity in the district, with Waitomo Village being a tourism site of national and international repute. Scope exists for developing further opportunities for adventure tourism, building on Waitomo Village as the major tourism hub. The water and wastewater infrastructure at the Village is held in private ownership, with the water treatment plants and reservoirs located on private or leased land.

6.3 URBAN INFILL AND RESIDENTIAL EXPANSION

In so far as wastewater capacity is concerned, increased demand due to the additional number and distribution of dwellings has a much greater impact than population change.

The District Plan (currently under review beginning 2017) allows for smaller lot sizes in the residential zone where sewerage services are available, defined by minimum yard separation distances and maximum building site coverage of 35%, without resource consent. Otherwise, a minimum lot size of 2,500m^2 is required.

With reticulated sewerage in place, infill development can occur in residential areas as a permitted activity, with minimum lot sizes reducing to 300m^2. In a "Greenfield" residential development with reticulated sewerage, the minimum lot size is 600m^2. No similar restriction applies in the case of water supply availability, although the absence of a reticulated water supply at towns such as Awakino, Te Waitere and Marokopa is possibly inhibiting the rate of development at these locations.

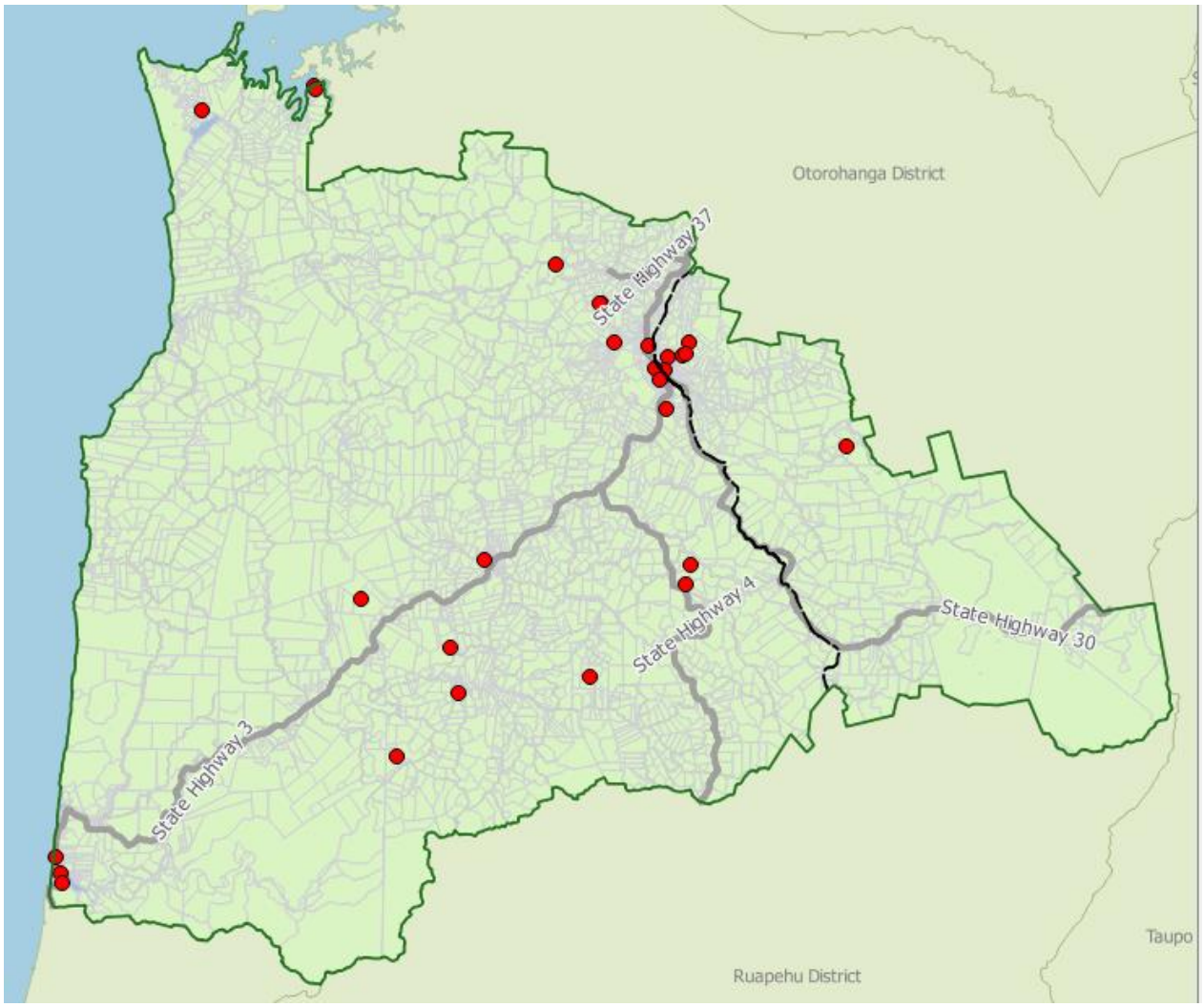
The absence of reticulated sewerage services in the coastal settlements of Mokau and Awakino will ultimately restrict residential development in these locations. The minimum lot size in these residential areas is currently 2,500m^2 due to the absence of reticulated sewerage services

Completion of the Piopio sewerage scheme in 2012 has enabled further residential infill development down to minimum lot sizes of 300m^2. The rate of development, though, is minor partly because of the high connection costs of the scheme, the decline in normally resident population in the district, and the slow economic recovery.

Historic trends of pockets of sub divisional and building activity in the form of modest lifestyle development around Te Kuiti, Waitomo Village, Mokau, and Awakino has slowed. The subdivisional activity that was occurring in and around the Te Waitere area has slowed in recent years.

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 growth is unlikely to place pressure on the provision of Council services. Indications are the recent trends of relatively slow development are likely to continue into the foreseeable future.

An indication of that is the modest number of building consents issued for new dwellings in the district over the past 3 years (i.e. 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 figure below illustrates this.



The "rural" entry comprises mostly new dwellings located immediately adjacent to urban areas, reflecting demand for lifestyle sized units. Of these, Te Kuiti and the beach settlement areas remain the preferred locations for new dwellings, typically on rural lifestyle properties.

For the past few years, WDC has been working on improving the condition of its core infrastructural assets, particularly in the water supply and sewerage activity areas, in order to support public health outcomes and to meet its new resource consents and other legislative requirements. The modest growth and development trends support this approach, which continues to maintain existing assets as opposed to the development of new infrastructure capacity. There is currently enough capacity in the wastewater infrastructure network to allow for modest growth should it occur.

It is expected that any increase in demand from residential development over the term of this AMP will be minor and readily accommodated within the existing capacity of WDC's wastewater schemes.

6.4 GLOBAL WARMING

Current predictions of the effects of global warming on the west coast of New Zealand could mean increasing frequency and duration of high intensity rainfall events, with longer drought periods during summer months more likely to occur on the east coast. These are long run predictions, with localised variations on the overall trend expected to continue at least over the term of the current planning period.

For WDC's wastewater services, increased frequency of heavy rain during winter months could eventually impact on the amount of inflow and infiltration entering the respective sewerage networks

and overloading pump stations and treatment plants. This is an existing problem in Te Kuiti, with CCTV inspection and replacement and /or rehabilitation work continued to be provided for in the 2018 – 28 LTP.

6.5 COMMUNITY EXPECTATIONS

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

- Increasing public awareness of environmental issues and intolerance of pollution.
- Increasingly stringent discharge consents imposed for the quality of effluent from the wastewater system
- Very high cost of health and safety legislation compliance.
- Increased expectation for access to a reticulated wastewater scheme at the coastal communities in particular, and other townships
- Increased consultation required for adoption of levels of service (time and cost thereof).

The implications of these trends on existing wastewater services over the next 30 years will be:

- Modest increased demands on the capacity of utility networks can be accommodated without substantial upgrading.
- Future maintenance and upgrades associated with the growth of the networks will be minor within the planning period.
- Most of the wastewater schemes are small with small ratepayer bases but the base requirements and therefore cost are the same. This make any of the wastewater services very expensive. Even the largest of the schemes, at Te Kuiti, is of average size in a national context.
- Possible Changes to LoS could have substantial impacts on costs to consumers (e.g. resource consent conditions)
- Demand for installation of public wastewater services at Mokau - Awakino and possibly Marokopa and Te Waitere
- Potential transfer of ownership and management responsibility for the Waitomo wastewater system.

6.6 IMPACT ON CURRENT CAPACITY

The following tables provide a preliminary, indicative analysis of the impact of the above development pattern on wastewater scheme capacity at Te Kuiti, Piopio, Benneydale and Te Waitere:

WASTEWATER	Te Kuiti	Piopio (Design parameters)	Benneydale	Te Waitere
Current population served	4,218 plus wet industry	500	240	11 residential connections (30-40 people)
Current discharge volume	Average 2,850m^3/d. Peak 8500 m^3/d.	Average 86 m^3/d. Peak 305 m^3/d.	Average 53m^3/day. Peak 70m^3/d	90%ile 3.34 m^3/d.
Treatment plant capacity	Average 4,000 m^3/d. Peak 7,000 m^3/d	Spare capacity (2017) for an additional 23 residential connections.	85 m^3/d. Spare capacity (2017) for an additional 27 residential connections.	NIL
Consented effluent discharge volume	7,000 m^3/d	135 m^3/d. Peak 6 L/s.	85 m^3/d	10.3m^3/d (19 residential connections)

Figure 6.6 Impact on currency

6.7 DEMAND MANAGEMENT STRATEGY

Council is desirous of managing this growth to avoid the current ad-hoc pattern of development continuing with its cumulative impact on the local natural landscape and an inevitable liability in years to come, involving replacement of the existing privately owned water supply and wastewater disposal arrangements with public services at the expense of Council's ratepayers.

Development, especially residential style development around the beach communities and at Waitomo Village needs to be managed to avoid over-subscription of the existing scheme capacities. Structure plans, which will feed into a future review or change to the District Plan, are needed to provide guidance for developers and to inform the design capacity of the respective sewerage schemes in existence at present. The strategy is to avoid ad-hoc connection that may lead to exceedance of downstream scheme capacity, with attendant risk of additional expense for the ratepayers who funded the original capital cost of the sewerage schemes. Planning and quantifying all future development, consistent with a development strategy that facilitates implementation of the future vision and form of the district, is necessary.

6.7.1 Mokau

A preliminary high level development strategy (December 2008) was prepared for the possible growth areas identified above. Preliminary planning maps have been prepared identifying where officers believe or understand development is most likely to occur, starting with the coastal strip bordered by the Awakino River to the north and the Mokau River to the south and including the land affected by the above sub divisional consent applications. Reticulated waste water services may be required in future in place of private soakage fields. Introduction of reticulated sewerage to service the combined area would open the door for infill subdivision to occur down to a minimum lot size of 300m^2, or 600m^2 for a greenfield development. Without reticulated sewerage, the minimum lot size is 2500m^2. A project to investigate wastewater services for this settlement has been planned for 2030-32 at a budget cost of $110,000 over the two years. A high level concept design identified 386 potential sections for inclusion in a scheme. Based on a small-bore reticulation system similar to Piopio and land disposal, the indicative cost is $23.6 million. Funding of additional network capacity associated with the concept design could possibly be met from development contributions at the time of building consent application in the case of the approved sub divisional consent applications, and at the time of sub divisional consent application for future development or a targeted wastewater development rate.

6.7.2 Te Waitere

At Te Waitere, a similar high level development strategy has been considered involving provision of water and upgraded sewerage services. A staged sewerage scheme with initial capacity for an additional 50 dwellings in the future at the apex end of the peninsular, would facilitate infill development as for Mokau – Awakino. The investigation and design is however on hold until a full geotechnical investigation of the area had been completed and included in the future structure or district plan. There is no provision in the 2018-28 LTP for any geotechnical work or investigation and design.

6.7.3 Te Kuiti

In Te Kuiti, a 37 lot residential subdivision at the north-west end (circa 2007/08) of Te Kuiti helped to fill the gap in the housing market created by a predominantly ageing housing stock. The rate of take–up of these new sections will not impact on the existing wastewater scheme within the planning period. The current modest rate of residential growth in and around Te Kuiti, projected to decline in the medium term, is not expected to impact on the capacity of the existing wastewater scheme.

6.8 ADDITIONAL ASSET CAPACITY REQUIRED

(New assets and asset improvements due to growth)

No additional asset capacity is expected in the next 30 years and there is no plan for additional capacity in this AMP.

If any additional wastewater capacity becomes necessary, it is expected that improved operations will cope with the extra capacity.

Overall, while the predicted demand for additional sewerage capacity is relatively low, there remains a need to manage the existing asset capacity effectively.

6.9 OTHER SCHEME PROPOSALS

Other areas currently not serviced with a public waste water service but which may demand a service in the future, are summarised below:

6.9.1 Waitomo Village

The expected growth at Waitomo Village was first investigated in 2008-9 and has been revisited annually since. The current water and wastewater infrastructure is held in private ownership and is therefore not part of Council's asset management responsibilities. An alternative option being a "greenfields" concept to avoid uncertainties and hence financial risks associated with the location, age, condition and performance of the existing wastewater (and water) services has been considered at a very high level but is not financially viable without significant external funding. Discussions with the owners has been intermittent and no tangible progress has been made regarding security of tenure over the land, transfer of asset ownership, or funding. Therefore, the prospect of Waitomo Village wastewater services transferring to WDC's ownership and management does not form part of this AMP.

6.9.2 Taharoa

The Taharoa scheme is privately owned and operated by BHP Steel Mining Ltd. There is no provision in this AMP for Council assuming responsibility for this scheme

6.9.3 Marokopa

The Marokopa community relies on private septic tanks. There is a risk of contamination between private water supply bores and septic tank contamination of groundwater. It is unlikely that Council will initiate a community scheme in the short term, although this may be introduced in the next planning period. There is no provision for this in the 2018 – 2028 LTP.

6.9.4 Aria

The Aria community relies on private septic tanks, perceived to have minimal risk. There is a risk of contamination between private water supply bores and septic tank contamination of groundwater. It is unlikely that Council will initiate a community scheme in the short term, although this may be introduced in the next planning period. There is no provision for in the 2018 – 2028 LTP.

6.10 HOW ADDITIONAL ASSET CAPACITY WILL BE PROVIDED

Local infrastructure as result of new sub divisional development, such as new sewerage pipes, is installed by developers at the time of subdivision development and then vested in Council's ownership for ongoing management and maintenance.

Council has a financial contributions policy but has rarely been applied. The growth related component of the capital cost of providing additional assets or increasing the capacity of existing WDC infrastructure is expected to be low for a long time and the benefits of growth are regarded to outweigh financial or development contributions at this time.

SECTION 7 - RISK MANAGEMENT

7.1 RISK MANAGEMENT CONTEXT

Risk identification and management for the Wastewater Activity has been modelled on AS/NZS 4360. A pragmatic approach has been taken to risk management. In identifying risk events they have been 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 interdependencies, where other services impact on the organisation or individuals, e.g. power supply failures, material supply failures.
- Physical failure risks, where condition or performance of the asset could lead to failure.
- Operational risks, where management of the asset or asset management activities may impact adversely on the asset. This includes unsustainable funding deficiencies

The legal liability for nuisance, negligence and third party damage needs to be recognised.
Consequences of failure are linked to the asset types and include:

- Repair costs
- Loss of income
- Loss of service
- Loss of life, or injury
- Health impacts
- Environmental impacts
- Damage to property
- Failure to meet statutory requirements
- Third party loss
- Loss of image

The probability of physical failure of an asset is directly related to the current condition of the asset, hence the importance of realistic and accurate condition assessment.

The effort put into assessing and managing risk needs to be proportional to the risk exposure.

Risk management flow chart (Refer AS / NZS 4360)

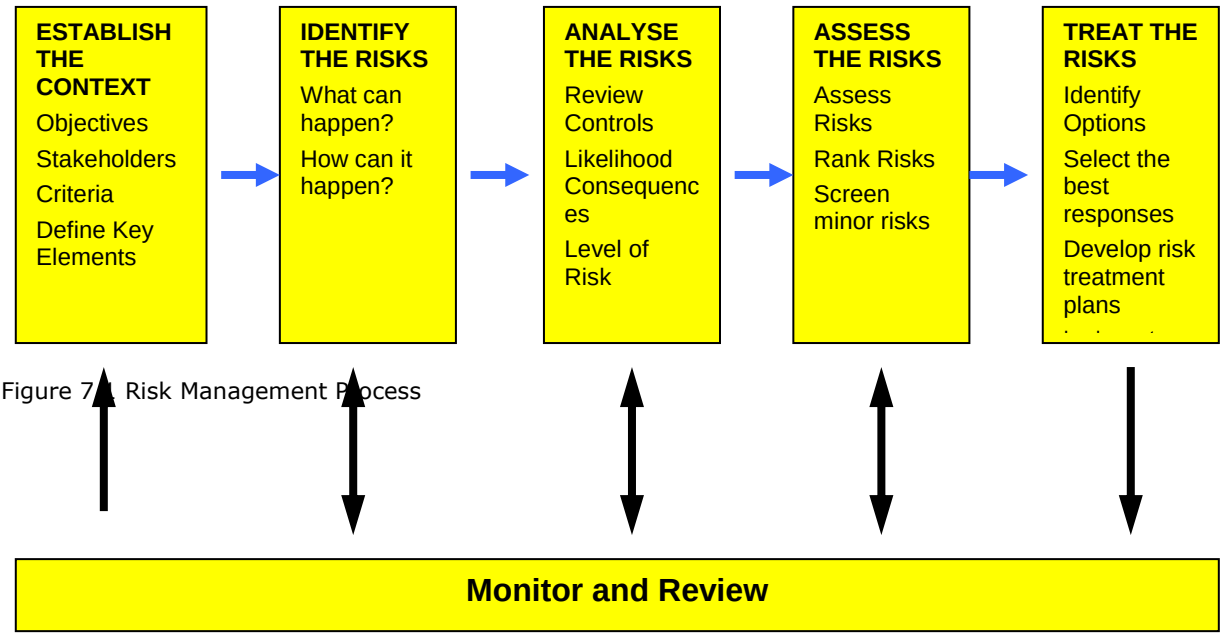


Figure 7.1 Risk Management Process

7.2 RISKS TABULATION

The following table lists the risks rating matrix:

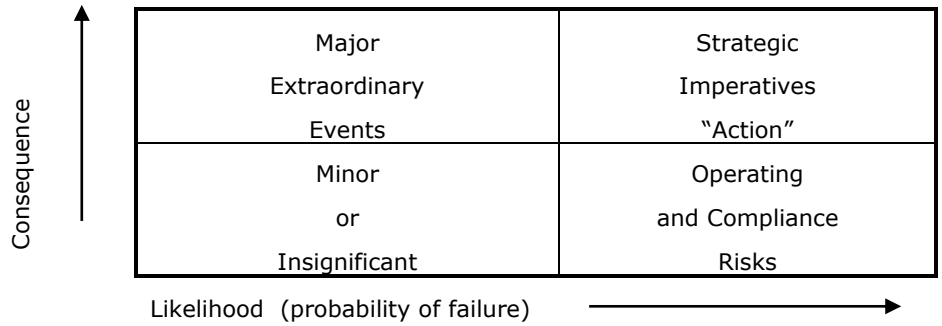


Figure 7.2: Risk Matrix

Risks are aligned to: Public Health; Environment; Security of Service; Quality; Asset Protection and Capacity.

The following table explains the risk rating matrix used to assess the risks tabulated below for the water supply activity assets. Risk is assessed as the product of Consequence and Probability, thus a high likelihood of the event occurring with a major consequence leads to an extreme risk that requires immediate action.

EVENT	Consequence				
Likelihood Rating	E Negligible	D Minor	C Moderate	B Major	A Catastrophic
9 - 10 Almost Certain	Moderate	High	High	Extreme	Extreme
7 - 8 Likely	Moderate	Moderate	High	Extreme	Extreme
5 - 6 Moderate	Low	Moderate	Moderate	High	Extreme
3 - 4 Unlikely	Low	Low	Moderate	High	Extreme
0 - 2 Rare	Low	Low	Moderate	High	High

Figure 7.3: Risk Rating

Measures of likelihood or probability are explained in the table below:

Likelihood	Descriptor	Description	100% Probability of Failure	Probability
9 – 10	Almost Certain	The event is expected to occur in most circumstances	Within 1 year	0.9
7 – 8	Likely	The event will probably occur in most circumstances	Within 2 years	0.5
5 – 6	Possible	The event should occur at some time	Within 3 – 10 years	0.15
3 – 4	Unlikely	The event could occur at some times	Within 11 – 20 years	0.07
1 – 2	Rare	The event may occur but only in exceptional circumstances	After more than 20 years	0.02

Figure 7.4: Probability Table

Measures of consequence or impact are explained in the table below:

Consequence	Descriptor	Financial	Technical	Personnel Incident or Accident	Social	Political	Commercial
1	Negligible	< $10,000	Minimal impact to production	First Aid Treatment. Limited lost time	Minimal impact or disruption	Minimal Interest	Minimal Impact
2	Minor	> $10,000 < $50,000	Limited disruption & some loss of production	Medical treatment required. Lost time injury	Some disruption to normal access or community systems	Minor Impact or interest. Questions raised in local Forums. Local media reports	Claims from business or repairs to other services. Customers inconvenienced.
3	Moderate	> $50,000 < $500,000	Significant impact, production reduced or stopped for up to two weeks	Serious injury. Extended medical treatment required	Disruption to public access and other systems. Increased potential for incidents.	Community discussion. Broad media cover. Questions raised in parliament.	Significant claims. Customers forced to other options. Questions from regulator.
4	Major	> $500,000	Disruption and damage to system or incident involving other structure	Serious Injury or loss of life	Extensive disruption. Incidents / accidents involving the public	Loss of confidence in facility management. Corporate credibility affected.	Loss of substantial business opportunity. Rebuke or threat from regulator
5	Catastrophic	Very high. Extensive losses within & beyond the system	Extensive disruption and damage with broad impact on other infrastructure	Loss of more than one life and or extensive injuries	Broad impact on community health or the environment	Public furore and investigations. Management changes demanded	Loss of substantial part of business. Loss of licence for large area or region

Figure 7.5: Measures of Consequence or Impact

7.3 MITIGATION MEASURES

Mitigation measures typically include design and engineering measures to strengthen the ability of the asset to withstand the hazard event and or prevent public access.

When an asset has failed or is expected to fail in the future, strategies are developed to avoid or react to the failure. If the failure mode of an asset is critical to the organisation, failure avoidance is likely to be more effective than reactive activities.

Depending on the failure mode, the strategies may include: changed maintenance activities, rehabilitation works, replacement works, back-up systems or abandonment of the asset.

These Strategies can provide a list of works, which may be further broken down into:

'Should Do" - complete within 5 years
'Could Do' – works which may possibly be deferred for 5 years
'Defer' – works which can be deferred for 5 years based on the risk rating matrix above.

The table below gives guidance on mitigation measures:

Risk Category	Action
Extreme	Immediate Action Required to reduce risk
High Risk	Treatment options must be reviewed and action taken to manage risk
Significant Risk	Treatment options reviewed and action taken dependent on treatment cost
Low Risk	Manage by routine procedures

Figure 7.6: Risk vs Action

7.4 CRITICAL ASSETS

The critical urban wastewater assets have been defined as those which would have the greatest consequences, including major impact on environmental and public health service levels, in the event of failure. Critical assets for the Wastewater Activity are those assets in the risk assessment table below rated as having highest criticality.

Failure of other components of individual wastewater schemes would result in localised adverse effects, but are not of the same scale or intensity as the critical asset components. System failure could include capacity overload due to high inflow/infiltration of sewers, leading to upstream overflow of raw sewage at manholes and low lying residential gully traps.

Asset criticality within the wastewater network is summarised as follows:

Criticality	Asset Type
1 (Most Critical)	• Terminal and other pump stations located on trunk main • All trunk main sewers to treatment plants • Effluent transfer pump and pipelines
2	• Treatment plant screens • Pump stations other than those located on trunk main • Any pipe with diameter > 250mm diameter other than trunk mains • Sludge dewatering and handling systems
3 (Least Critical)	• Treatment aeration systems • Anaerobic digesters • Activated sludge processes • All other pipes with diameter <= 250mm diameter

Figure 7.7: Asset Criticality

All assets in the Risk Assessment shown with a high risk or above should also be also be considered – refer to APPENDIX C: WASTEWATER RISK ASSESSMEMT.

7.5 NATURAL HAZARDS

The natural hazard events considered relevant to this AMP are those most likely to impact on lifelines as defined in the Civil Defence and Emergency Management Act 2002.

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.

7.6 RESILIENCE TO NATURAL HAZARDS

The main risks to the critical wastewater assets resulting from natural hazards relates to a significant earthquake, or flooding.

7.7 IMPACT OF RISKS ON PROGRAMME FUNDING

The funding of measures to protect wastewater assets from high risks would impact on current budget provisions. That in itself introduces a further risk; that asset condition may decline in the short term because of the diversion of funding away from core maintenance and renewal programs in the absence of additional funding.

Further analysis of risk criticality and mitigation measures will be carried out over the next three years as part of the AMP Improvement Plan to quantify and prioritise mitigation measures within available budgets.

7.8 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.

SECTION 8 - LIFECYCLE MANAGEMENT

8.1 INTRODUCTION

This section outlines the management strategies for operating, maintaining, replacing and developing wastewater assets to provide the agreed levels of service (as defined in SECTION 5 - LEVELS OF SERVICE) while optimising lifecycle costs.

The strategies cover all asset life cycle work activity:

- Operation
- Maintenance
- Renewal
- Development/augmentation
- Disposal

The strategies are translated into detailed work programmes and budget projections for each wastewater scheme summarised in the Financial Summary (**Error! Reference source not found.**).

8.2 ASSET OPERATIONS

8.2.1 Background

Asset operational activity is work or expenditure which has no effect on asset condition but which is necessary to keep the asset functioning, such as the provision of staff, consumable materials, resource consent applications and compliance, monitoring, and investigations. Asset operational activities exclude maintenance work.

Operational requirements, procedures and activities are documented and supplemented by local knowledge and judgement of experienced staff.

8.2.2 Operational Strategies

- Prepare quality AMP based on a sound knowledge of infrastructure, customer needs and preferences
- Optimise asset management practices and decision-making:
    - Continue to collect asset management data (physical attributes, asset performance/condition, and costs) and use data to inform optimised decision making on maintenance, renewal or development options
    - Determine the condition and decay rates of the networks by analysing condition reports provided by contractors and/or works staff during the day to day operation of wastewater assets and, as necessary, carrying out material testing.
- Operate wastewater assets in compliance with current resource consents.
- Minimise asset ownership costs by:
    - considering all life cycle costs, including operational costs, when evaluating asset renewal/acquisition decisions
    - identify, evaluate and introduce new technologies that may improve operational and management efficiency and modify standards as appropriate
    - continue to observe competitive tendering procedures for asset maintenance, renewal, and construction works.
- Resource Consents:
    - Discharge consent applications will propose standards for effluent quality, disposal method and operation, which reflect community wishes with respect to environmental protection, public nuisance and affordability.

8.2.3 Operational Standards and Specifications

Operate assets in compliance with:

- this AMP
- defined processes, procedures and recognised trade practice
- resource consents

- statutory requirements.

8.3 ASSET MAINTENANCE

8.3.1 Background

Maintenance can be defined as the regular work and immediate repairs necessary to preserve an asset in a condition, which allows it to perform its required function. The ongoing efficiency of routine maintenance is critical to achieve optimum asset life cycle costs that best suit the desired levels of service.

Maintenance falls into two categories, planned and unplanned, each having quite different triggering mechanisms and objectives

Unplanned maintenance:	• Corrective work carried out in response to reported problems or defects with the wastewater system (e.g., collapsed or blocked pipes, etc.).
Planned maintenance:	• Preventative maintenance carried out to a predetermined schedule with the aim of ensuring continuity of service, preserving asset design life and, if economic, extending asset life (e.g. annual pump servicing programmes) • On-condition maintenance carried out as a result of condition or performance evaluations of assets and asset components (e.g., sewer mains flushing, manhole cleaning etc.).

Figure 8.1: Planned and Unplanned maintenance definition

8.3.2 Deferred Maintenance

Deferred maintenance refers to maintenance works that have not been completed on a timely basis and are overdue for attention, potentially leading to a decline in levels of service. Future maintenance budgets may need to be increased to catch-up with accumulated deferred maintenance items.

8.3.3 Funding of Operating and Maintenance Costs

The funding of operating and maintenance costs is from targeted rates and user charges (e.g. trade wastes charges).

8.3.4 Mode of Service Delivery

Reticulation maintenance works are undertaken by external contractors in accordance with Council procurement procedures. The contract specifies the standards of materials, workmanship and response times, to be met.

Treatment plant operations are currently undertaken by WDC staff in accordance with an internal service agreement. The agreement specifies the effluent quality standards to be achieved, workmanship and response times to be met.

8.3.5 O and M Expenditure Projections

The Financial Summary in Section 10 includes anticipated O and M work needs and costs over the next 30 years for:

- operational activity (monitoring, inspections, testing, meter reading, etc.)
- expected maintenance work requirements

The operating and maintenance costs exclude adjustments for inflation. These estimates will be reviewed annually in parallel with WDC's annual plan preparation.

8.4 ASSET RENEWALS OR REPLACEMENTS

8.4.1 Background

Asset renewal is capital work, which does not increase the assets design capacity but restores, rehabilitates, replaces or renews an existing asset to extend its economic life and/or restores the service potential. Work that increases the design capacity of assets is defined as upgrading/development work.

8.4.2 Renewal Strategies

The general renewal tactic is to rehabilitate or replace assets when justified by:

Asset performance: Renewal of an asset where it fails to meet the required level of service. Non-performing assets are identified by the monitoring of asset reliability, capacity, and efficiency during planned maintenance inspections and operational activity. Indicators of non-performing assets include:

- structural failure
- repeated asset failure (sewer blockages, surcharging etc), repeated sewer overflows
- ineffective wastewater treatment

Economics: Renewals are programmed with the objective of achieving;

- the lowest life cycle cost for the asset (the point at which it is uneconomic to continue repairing the asset), and
- a sustainable long term cash flow by smoothing spikes and troughs in renewals programmes based on the estimated economic lives of asset groups, and
- savings by coordinating renewal works with other planned works in the area.

Risk: The risk of failure and associated financial and social impact justifies action (e.g. probable extent of property damage, safety risk).

Renewal works are assessed and prioritised in accordance with the following priority ranking table, the cost/ benefit of each project, Council's objectives and strategies, and available funds.

Priority	Renewal Criteria
1 (High)	▪ Asset failure has occurred and renewal is the most cost effective option. ▪ Asset failure is imminent and failure is likely to have major impact on the environment, public safety or property ▪ Condition and performance ratings of asset is 4 - 5 (poor or very poor) ▪ Asset performance is non-compliant with resource consent requirements ▪ The asset is a critical asset or has a criticality rating of 1
2	▪ Asset failure is imminent, but failure is likely to have only a moderate impact on the environment, public safety or property. ▪ Asset failure is imminent and proactive renovation is justified economically ▪ Condition and performance ratings of asset is 3 (moderate/average) ▪ System upgrading scheduled within five financial years as asset is nearing end of economic life. ▪ Asset renewal is justified on the basis of benefit cost ratio and deferment would result in significant additional costs ▪ The asset has a criticality rating of 2
3	▪ Asset failure is imminent, but failure is likely to have a minor impact on the environment, public safety or property ▪ Condition and performance ratings of asset is 4 - 5 (poor or very poor) ▪ Condition and performance ratings of asset is 2 (good) ▪ Asset renewal is justified on the basis of life cycle costs, but deferment would result in minimal additional cost ▪ The asset has a criticality rating of 3

Priority	Renewal Criteria
4	▪ Existing assets have a low level of flexibility and efficiency compared with replacement alternative ▪ Condition and performance ratings of asset is 1 - 2 (good to excellent)
5 (Low)	▪ Existing asset materials or types are such that known problems will develop in time. ▪ Condition and performance ratings of asset is 1 (excellent)

Figure 8.2: Selection Criteria for Asset Renewal

The renewal programme will be reviewed at least annually and any deferred work will be re-prioritised, based on the best available information of asset condition and performance, life cycle costs and benefits, with all replacement work and a revised programme established. Integral with the replacement strategy will be a funding strategy. Essentially, cash flow smoothing will be applied to balance income with expenditure through either raising loans, reprioritising work based on monitoring of actual asset condition and performance.

8.4.3 Renewal Standards and Specifications

The standards and specifications for renewal works are generally the same as for new works. Material selection is made based on operating conditions, levels of service, capacity requirements and cost evaluation. Materials are installed in accordance with the relevant standard specification and manufacturers instructions and to recognised good trade practice.

8.4.4 Deferred Renewals

Renewal works identified in terms of the renewal strategies may be deferred if the cost is beyond the community's immediate ability to fund it and the priority for the work is not high. This could occur when higher priority works are required on other infrastructural assets (e.g. water supply), or there are short term peaks in expenditure.

When renewal work is deferred, the impact of the deferral on economic inefficiencies and the system's ability to achieve the required service standards will be assessed. Although the deferral of some renewal works may not impact significantly on the operation of assets, repeated deferral will create a liability in the longer term. A register of all deferred works will be maintained, the total value of which will be recognised in WDC's financial reporting.

8.4.5 Funding of Renewal or Replacements

The funding of renewals/replacements is from the depreciation fund.

8.4.6 Mode of Service Delivery

Replacement and renewal works are undertaken by external contractors in accordance with Council procurement procedures.

8.5 ASSET DEVELOPMENT/AUGMENTATION

8.5.1 Background

Development/augmentation works are those works that create a new asset that did not exist in any shape or form or works which upgrade or improve an existing asset beyond its existing design capacity.

Assets are acquired as a result of:

- taking over new infrastructure constructed as part of sub divisional development (constructed at the developer's expense and to Council specifications).
- extensions constructed by Council to service new areas
  - asset upgrading constructed by Council to provide;

- additional system capacity to overcome inadequacies or provide for growth or solve problem areas (e.g. larger sewer mains, increased pump capacity, additional treatment plant capacity)
- improved levels of service e.g. treatment plant upgrades necessary for compliance with new resource consent standards

8.5.2 Development/Augmentation Strategies

Wastewater schemes will be developed to meet community expectations and growth projections over the next 30 years, and technical and environmental standards.

A 30 year programme is essential to obtain the long term vision for the network and to confirm compliance with regional policy statements and the strategic goals for growth and development of the district. This programme can be debated and amended to accommodate changing needs of the community.

New works are identified on the following basis

- Growth - ability to meet the most likely demand projections
- Regulatory - anticipated expenditure needed to meet resource consents required under the Resource Management Act
- Operational efficiency - to reduce costs and improve efficiency

The selection criteria for the prioritising and programming of asset development projects is a function of Council preference, consideration of risk, costs and benefits, affordability and ranking with other projects

Priority	Selection Criteria for New Capital Works
1 (High)	▪ Proposed work is consistent with relevant community outcomes and is driven by sustainable demand or required to augment existing capacity ▪ Work will provide long term environmental and public health benefits to community ▪ Work is required for compliance with statutory obligations ▪ Work involves completion of an earlier stage of the project ▪ Environmental and/or public health safety represents a high proportion of work benefits
2	▪ Proposed work is consistent with relevant community outcomes ▪ Work required for medium term environmental benefits ▪ Environmental/public health safety considerations represent a medium proportion of work benefits ▪ Upgrading of infrastructure scheduled within five financial years as asset is nearing end of economic life. ▪ Work is strongly supported by affected community through a process of public consultation
3	▪ Proposed work is consistent with relevant community outcomes ▪ Work is strongly supported by local sector of community through a process of public consultation ▪ Capital work is justified on the basis of economic evaluation, but deferment would result in minimal loss of opportunity or additional cost.
4	▪ Work is supported by interest group or small part of local community through a process of public consultation
5 (Low)	▪ Project is discretionary and can be deferred with minimal loss of benefit to the community

Figure 8.3: Selection criteria for new wastewater works

Project approvals will be supported by an economic appraisal technique which takes into account:

- capital costs
- any change in net annual operating costs
- any change in annual maintenance requirements
- any salvage value of existing assets or components.

All options are examined when evaluating upgrading options, including:

- repair
- renovation techniques
- replacement
- augmentation.

The risk, cost and benefits of accepting new privately funded assets, constructed in association with property development or as a result of an agreed ownership transfer (e.g. Waitomo Village infrastructure) will be reviewed and a decision to approve made on a case by case basis following evaluation by Council staff. Such assets will be accepted into public ownership by Council when satisfactorily completed in accordance with the acceptance criteria given. Council will not contribute to the cost of such works unless there are exceptional levels of service or equity issues.

8.5.3 New Works Standards and Specifications

Material selection is made based on operating conditions, required levels of service, capacity requirements and cost evaluation. Materials are installed in accordance with the relevant standard specification and manufacturers' instructions and to recognised good trade practice.

8.5.4 Funding of Additional Capacity

Growth-related work will be funded initially from loan finance with Council maximising the use of external subsidies and financial or development contributions where possible. Other works will be funded from loans and rates. Refer to Council's Revenue and Financing Policy in its Long Term Plan (LTP) for further details.

8.5.5 Mode of Service Delivery

Development/augmentation works involving the construction of new wastewater assets will be undertaken through external, arms-length contracts, on a case by case basis in accordance with Council's procurement policy.

8.6 ASSET DISPOSAL

8.6.1 Background

Assets may become surplus to requirements for any of the following reasons:

- under utilisation
- obsolescence
- provision exceeds required level of service
- uneconomic to upgrade or operate
- policy change
- service provided by other means (e.g. private sector involvement)
- potential risk to continued ownership (financial, environmental, legal, social, vandalism).

Disposal activity for wastewater assets typically relates to the sale of surplus land and the demolition of obsolete structures and abandonment of replaced reticulation. There are presently no Council wastewater assets listed or planned for disposal.

8.6.2 Asset Disposal Strategies

- Develop AM systems and asset condition / performance data to allow better planning for the disposal of assets through rationalisation of the asset stock or when assets become uneconomic to own and operate.
- When considering disposal options, all relevant costs of disposal will be considered, including;

- evaluation of options
- consultation/ advertising
- obtaining Resource Consents
- professional services, including engineering, planning, legal, survey
- demolition / make safe
- site clearing, decontamination, and beautification.

The use of revenue arising from the sale of any assets shall be decided by Council at the time of its consideration of the asset's disposal.

8.7 SCHEME SPECIFIC LIFECYCLE MANAGEMENT PLANS

This section details the management philosophy for each WDC wastewater scheme, describing:

- The scope and nature of the assets
- The current condition of assets
- The current capacity and performance of asset relative to the levels of service defined in SECTION 5 - LEVELS OF SERVICEand demand projections of SECTION 6 - FUTURE DEMAND
- The needs, timing and costs of operational, maintenance, renewal, acquisition and disposal works required to action the life cycle asset management strategies developed in Section 8.

Detailed financial forecasts are shown for the planning (30 year) period in the Financial Summary (Section 10). Financial estimates beyond the first three years are of modest accuracy at this stage because of the lack of detailed information relating to condition data and rate of asset decay.

8.7.1 TE KUITI WASTEWATER SCHEME

Asset Information

The original Te Kuiti wastewater scheme was installed during 1910 - 1916. The discharges led to a septic tank. In 1960, following the installation of the water treatment plant (1957), a drainage improvement programme and installation of a septic tank near the Te Kuiti Primary school was constructed. A pump station at Tawhana Street was constructed prior to 1967 along with extensions to the reticulation. During the late 1960's a further eight kilometres of reticulation was installed together with major drainage works at the north end of town. During 1968 investigation of an oxidation pond was carried out, and further mains were installed at Hill, Lawlor, Queen, King, and Hetet Streets. In 1972 construction of an oxidation pond at its present site and terminal pumping station at Te Kuiti Primary School took place. A 300 diameter AC pipe connected the pump station to the oxidation pond. During the 1970's, most of the sewer reticulation extensions on the west side of the railway line were carried out. During 1985 – 97, the oxidation pond was upgraded, and in 2002 the treatment plant was significantly altered and modernised to a modified activated sludge treatment plant.

Upgrade and reconfiguration of the wastewater treatment plant, including the addition of filtration and UV disinfection, was completed at end of 2013 and reconsented in 2015 for a period of 25 years.

Asset	Asset Component	Condition Grading	Performance Grading	Condition Data Confidence	Year Installed /Refurbished	Estimated Age (years)	Expected Economic Life
Pump Station	Building	2	1	A (Refurbished)	1984	33	50
Main	Valve Chamber	1	1	A	2009	8	50
	Ventilation	1	1	A	2003	14	15
	Lighting	1	1	A	2009	8	25
	MCC	3	2	A	2009	8	25
	Pump Control	1	1	A	2009	8	15
	Flygt Submersible	1	2	A	2009	8	15
	Pumps 4 x	1	1	A	2008	9	25

Asset	Asset Component	Condition Grading	Performance Grading	Condition Data Confidence	Year Installed /Refurbished	Estimated Age (years)	Expected Economic Life
	22 kW Lifting Equipment	2	2	A	1984	33	40
	Grit Chamber	1	1	A	2009	8	50
	Valve Chamber	1	1	A	2009	8	50
	Access Lids	1	1	A	2009	8	30
	Discharge Pipes	1	1	A	2009	8	35
	Valves	1	2	A	2009	8	35
Pump Station Tammadge St	Valve Chamber	2	3	B	1989	28	50
	Wet Well	2	3	A	1989	28	50
	Access Lids	2	3	A	1989	28	25
	MCC	3	3	A	1989	28	25
	Pump Control	2	3	A	1989	28	25
	Flygt Submersible Pumps 2 x 2.4 kW	2	3	A	1989	28	30
	Discharge Pipes	4	3	A	1989	28	50
	Guide Rails	2	3	A	1989	28	35
	Lifting Equipment	3	3	A	1989	28	35
	Valves	2	3	B	1989	28	50
Pump Station Waitete Road	Valve Chamber	2	2	B	1984	33	50
	Wet Well	2	3	A	1984	33	50
	Access Lids	1	1	A	2010	7	30
	MCC	1	1	A	2010	7	25
	Pump Control	1	1	A	2010	7	25
	Flygt Submersible Pumps 2 x 3.1 kW	1	1	A	2013	4	30
	Discharge Pipes	4	3	A	1984	33	50
	Guide Rails	2	3	A	1994	23	35
Pump Station Esplanade	Valve Chamber	1	1	A	1979	38	50
	Wet Well	2	2	A	1979	38	50
	Access Lids	1	1	A	2010	7	30
	MCC	1	1	A	2010	7	25
	Pump Control	1	1	A	2009	8	15
	Flygt Submersible Pumps 2 x 3.1 kW	1	1	A	2013	4	30
	Discharge Pipes	2	3	A	1979	38	50
	Guide Rails	4	4	A	1979	38	45
	Lifting Equipment	3	3	A	1979	38	45
	Valves	1	1	A	2003	14	50

Asset	Asset Component	Condition Grading	Performance Grading	Condition Data Confidence	Year Installed /Refurbished	Estimated Age (years)	Expected Economic Life
Pump Station Tawhana Street	Valve Chamber	3	3	B	1974	43	55
	Wet Well	3	3	A	1974	43	55
	Access Lids	1	1	A	1999	18	20
	MCC	3	3	A	1999	18	20
	Pump Control	3	3	A	1999	18	10
	Flygt Submersible Pumps 2 x 22 kW	3	3	B	1989	28	25
	Discharge Pipes	2	3	B	1974	43	50
	Guide Rails	3	3	A	1974	43	45
	Lifting Equipment	3	3	A	1974	43	45
	Valves	3	3	B	1974	43	50
Treatment	Oxidation Ponds	1	1	A	2012	5	100
	Aeration Pond Aerators	1	1	A	2012	5	100
	- Slasher (2 off)	1	1	A	2012	5	15
	- Other (11 off)	1	1	A	2012	5	15
	- Paddle (3 off)	1	1	A	2002	5	15
	Step Screen	1	1	A	2012	5	15
	Clarifier	1	1	A	2002	15	50
	Treatment structures	2	2	A	2002	15	50
	Filters	1	1	A	2012	5	30
	Ultra Violet	1	1	A	2012	5	25
	Sludge Management	1	1	A	2012	5	25

Figure 8.4: Asset Performance and Condition Grading – Te Kuiti

***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 due within next 10 year planning period
23 = indicative replacement date overdue

Reticulation

Records available on the scheme reticulation are sketchy, with quantities and details taken compiled from existing plans, local knowledge and investigation to arrive at lengths and sizes of sewer pipes. The bulk of the reticulation was installed between 1916 and 1970. This age data is considered reasonably accurate and from this it has been estimated that 95% of today's reticulation was constructed during that period. The reticulation material type has been estimated as shown in the figure below:

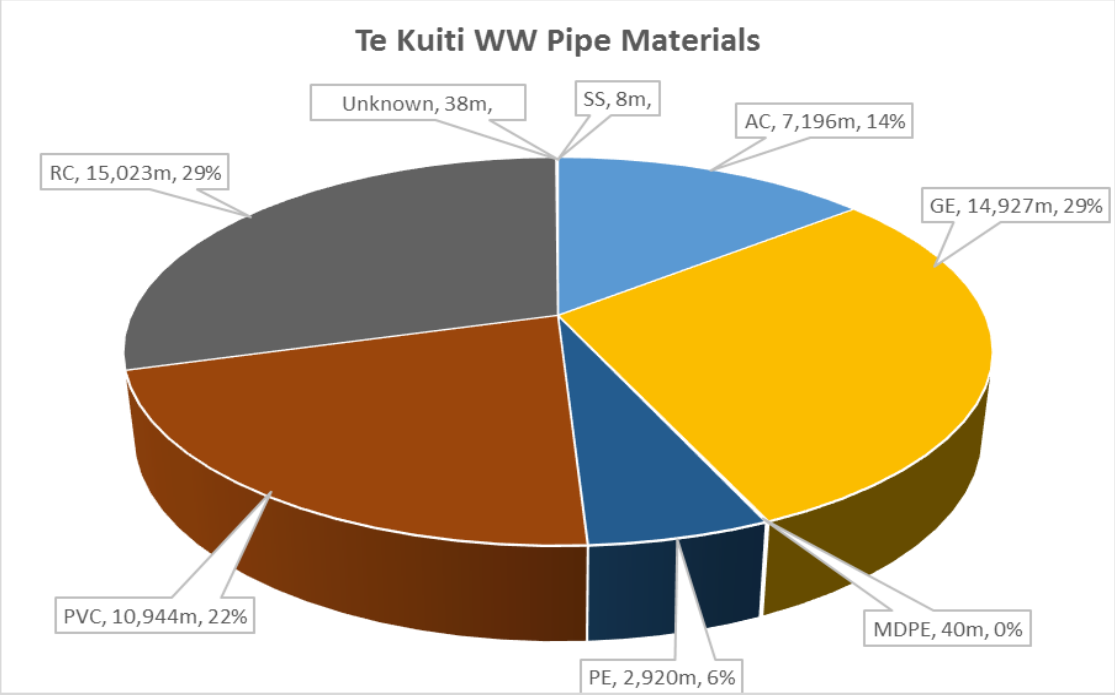


Figure 8.5: Pipe Materials

There are 735 sewer manholes in the Te Kuiti sewer reticulation and 51,096 m of pipe. The dominant pipe size is 150 mm diameter.

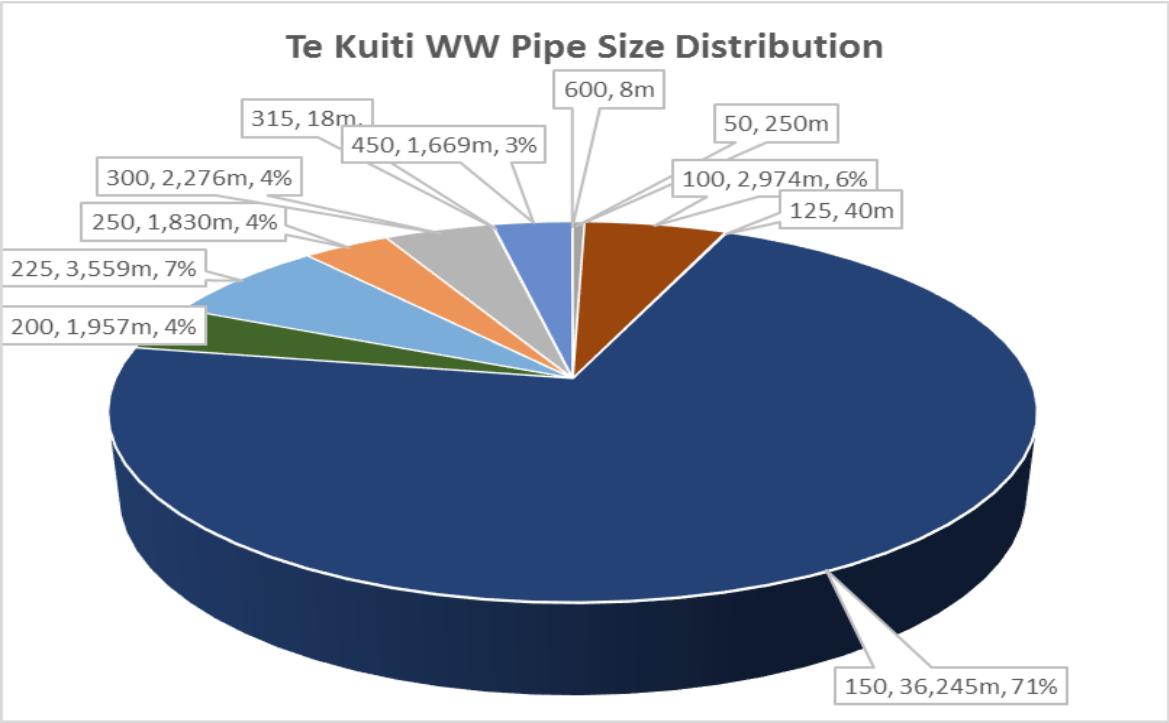


Figure 8.6: Pipes

Inflow/infiltration enter the reticulation system. A CCTV programme has been initiated beginning in 2009 and provision of funding to continue over the next 10 years is in this AMP. Work done to date showed that inflow of surface water directed into the sewer is the biggest problem significant remedial is work required and a lot has been done. Inflow and infiltration reduced markedly during the 2012 -2015 years. Investigation will continue from which decisions will be made regarding the appropriate mix of a rolling rehabilitation/replacement programme.

It is not known if there are any undersized assets within the reticulation and none are apparent however this will not be known with certainty until the asset register is fully developed and hydraulically assessed.

Pump Stations

The system contains four secondary pump stations and a terminal pump station.

Two of the pump stations have overflow pipes that can discharge into the Mangaokewa Stream during extreme rainfall events.

Terminal wastewater pump station
The main wastewater pump station is located beside the Mangaokewa Stream and immediately to the east of Te Kuiti Primary School grounds. The pump station is accessed off Hinerangi Street.

The pump station pumps from the buffer tanks at the end of the main gravity sewer into a PE rising main to the wastewater treatment plant. The current rising main crosses under the Mangaokewa Stream. The pump station was constructed in the 1970's and consists of reinforced concrete and masonry block construction building. The below ground, floor slab and roof slabs are reinforced concrete whilst the above ground walls are masonry block construction.

The lower section of the pump station was a rectangular reinforced concrete wet well with 3 submersible Flygt pumps and a valve chamber. In 2008-2009 this pump station was refurbished and the wet well turned into drywell pump station buffer storage was raised from about 20m^3 to 90 m^3. The same pumps were used but two old ones had been refurbished. A temporary pump station was installed ahead of the main station for the construction period, constructed such that it becomes the grit removal chamber after end of construction. Pipe work was installed such that it can be used as the main pump station for short period (weeks) should an event disable the main pump station. The drywell is accessed from an internal stairwell within the pump station building. The ground floor level has steel chequer plate lids for access to each pump. A 2 tonne capacity electric hoist and overhead monorail were installed when pump replacement of refurbishment is needed.

The motor control unit (MCC) and the electrical controls have been replaced and are compatible with a control system monitored through SCADA and telemetry. All pumps are on VSD's to provide a continuous flow of effluent to the treatment plant instead of the previous stop start operation. This has the added advantage that it maintain the level in the buffer tanks at a 30% which removed the cause of a number of upstream overflow events that occurred in earlier times when the sewage backed up in the reticulation and spilled out at low points.

The biofilter which was in poor repair was removed and subsequent to completion of the pumps station there had been no odour complaints from the school.

Te Kumi Road wastewater pump station
The pump station is located on the western bank of the Mangaokewa Stream of the northern approach to Te Kuiti. The pump station is accessed via a grassed access track off Te Kumi Road (SH3). Access into the pump station is by way of stairs & steps.

The pump station comprises a circular pre-cast wet well equipped with two Flygt submersible pumps. The top of the pump station has 1.4m raised reinforced concrete parapet walls to prevent high stream water levels entering the pump station.

The valve chamber is located adjacent to the wet well; the pre-cast wet well lid has been removed and replaced with a temporary mesh screen. The chamber fills with water during periods of high stream levels and consequently the valve chamber pipe work is subject to corrosion and the chamber fills with silt and debris.

The MCC is located in a weatherproof cabinet located at the top of the stream bank and accessed via steel steps.

Tammadge Street wastewater pump station
The pump station is located on the eastern side of the Mangaokewa Stream in the road berm between the railway line and Tammadge Street. The pump station is accessed directly from Tammadge Street.

The pump station has a circular pre-cast wet well and a separate valve chamber with pre-cast concrete slabs.

Hot dipped galvanised chequer plate lids give access to the two Flygt submersible pumps. The MCC is in a weatherproof cabinet beside the wet well, and as with the Te Kumi Road pump station the electrical controls require periodic inspection as it is not connected to the SCADA and telemetry system as yet. A timber barrier fence surrounds the pump station and a steel post and lifting arm are fitted for removal of the pumps.

Waitete Road wastewater pump station
The pump station is located on the western side of the Mangaokewa Stream at the southern approach to Te Kuiti. The pump station is accessed from Waitete Road.

The pump station is within the predominantly industrial area to the south of Te Kuiti and handles the effluent from the UBP Meat processing plant. As with Tammadge Street pump station, this pump station consists of a circular pre-cast wet well and adjoining valve chamber with pre-cast concrete slabs. The weight of these prevented removal.

The MCC is adjacent to the wet well and is contained within a weather proof enclosure on a raised concrete plinth. The electrical equipment has been upgraded and is in good condition and has been connected to the SCADA and telemetry system.

Redwood Gardens (Esplanade) wastewater pump station
The pump station is located on the eastern side of the Mangaokewa Stream and is accessed off the southern end of the Esplanade.

The pump station consists of a circular pre-cast wet well with two Flygt pumps and an adjoining valve chamber. The top discharge bends have been replaced with fabricated stainless steel bends. The wet-well chequer plate lids are in good condition apart from a rectangular section that has been cut out. The valve chamber has a chequer plate lid and the pipe work has been replaced with fabricated stainless steel and check valves installed.

Electrical cabinet and switches as well as the pumps were last replaced in 2010.

Tawhana Street wastewater pump station
The pump station is located in the berm of Tawhana Street and is accessed directly from the road.

This pump station differs from the other wastewater pump stations in Te Kuiti in that it is a much older station that has been renovated. The wet well appears to be circular and constructed of in-situ reinforced concrete.

There is a reinforced concrete housing over the top of the wet well with powder coated aluminium doors. The wet well access lids are newly constructed aluminium chequer plates and the wet well cover is a 6mm steel plate. The pumps are two Flygt submersible pumps mounted on guide rails. A monorail is attached to the concrete roof above the wet well. The valve chamber is not visible and is either under the footpath or the check valves are located in an inaccessible section of the wet well.

The MCC is located on the side of the building in a weatherproof cabinet. This is fitted with modern electrical equipment. It is not connected to the SCADA and telemetry system as yet

Rising Main

The Te Kuiti 300mm diameter AC rising main, having reached the end of its useful life, was replaced in 2005/06 with a 350mm diameter PE pipe.

Treatment Plant

Upgrade, including improvements to operating systems, a high rainfall inflow bypass pipeline and treatment/storage, plus reconfiguration of the reactor and provision for tertiary treatment in the form of sand filtration and Ultra violet disinfection as well as a sludge management at a cost of $9.4 million was completed in 2013.

Fig 8.7 New Reactor April 2013

Asset Performance

Environmental Standards

The final effluent consistently meets the quality and volume standards proposed in the new discharge consent. The new consent was issued in late January 2015 with a 25 year term expiring 30 January 2040.

Flow monitoring at the ponds indicates high infiltration/inflow during winter months. This has reduced significantly over the period 2012-2015 as neglected reticulation maintenance is addressed.

The cleaning and rehabilitation of the reticulation continue and with it the inflow and infiltration reduction programme.

Low areas of the reticulation used to overflow periodically during high rainfall events due to surcharge of the system. This has been resolved for all but very high rainfall events by cleaning the reticulation of grit and other heavy rubbish which accumulated over years of poor maintenance and the refurbishment of the main pump station through controlled pumping of the inflow instead of the earlier stop start operation which caused backup in the reticulation resulting in overflows.

Reliability
The trunk rising main theoretical capacity had been checked and it was tested empirically and found to be able to deal with all but extreme rainfall events estimated around 1:50 + year events.

Three of the six pump stations have overflow pipes which divert to the river avoiding surface health hazards. To mitigate this, an alarm system has been installed to alert operators of a high level position in any one of the three stations which is then attended and where possible the issue is rectified to prevent an overflow. Following various upgrades and improvements this occurs very seldom.

Treatment Capacity
The clarifier was modified and with coagulation assistance its operating capacity was increased from the 4,000m3/day design capacity to 6,900m3/day operating capacity to take care of peak flows. The average annual daily discharge volume is 3,360m3/day including significant trade waste discharge volume from two meat works plants.

The treatment plant used to operate outside its design capacity during high rainfall events due to inflow/infiltration into the reticulation system. Bypass facility and buffer capacity had been constructed to deal with the highly variable sewage generated in Te Kuiti. The refurbished and where applicable enhanced reactor configuration, aeration and sterilisation equipment mean it now consistently meet the final discharge quality set down in the proposed discharge consent.

Safety
There are no safety concerns with the scheme other than those addressed during routine maintenance.

Operational & Maintenance Programme

A by-product of the higher quality effluent now produced by the upgraded treatment plant is increased volumes of sludge production. The WWTP upgrade has been designed to deal with that (by a dewatering process etc.) but the operation requires careful operational management. Additional budget has been proposed ($55,000 p.a.) for the 2018 – 28 LTP to properly address sludge processing and disposal.

The treatment plant upgrade included the design and installation of additional mechanical and electrical equipment – mechanical aeration etc. Corresponding to that are additional operating and maintenance costs. An increase in the current frequency of routine mechanical and electrical servicing is required to avoid the risk of plant breakdown and the potential for consent non-compliance. For instance, aerator supplier maintenance specifications recommend routine inspection of aerators every 10 days. Crane hireage costs etc. to achieve that are simply unrealistic. An optimised, annual maintenance strategy has therefore been devised involving annual servicing of plant and equipment to achieve a balance between serviceability and affordability

Similarly, integral to effective treatment plant performance is the chemical dosing processes - lime and alum in particular. There are higher operating costs attributable to the use of these chemicals, together with associated safe handling and storage components that need to be factored into the budget. An additional $30,000 pa has been proposed for these additional costs for inclusion in the 2018 - 28 LTP.

See Financial Summary in Section 10.

Renewal Programme

The reticulation comprises of about 50km of sewer pipe of varying age, type, size and condition. Significant inflow and infiltration during wet conditions (approx. 5,000 m^3 per day), on top of the average dry-weather flow of approx. 2,850 m^3 per day, points to deterioration of reticulation condition within the network.

The inflow component of the high inflow will be partly attributable to the limited stormwater coverage in parts of Te Kuiti. Roof water connections and gully trap entry will sometimes be used as a default drainage system to relieve localised ponding.

The reticulation repair and renewal programme is preceded by a significant CCTV investigation programme to establish actual condition and at the same time to target the areas of highest inflow/infiltration (I/I). For 2018-2028 AMP purposes, it has been assumed that 33% of the network will need detailed investigation over the next ten years.

Following consideration of affordability, and because of the lack of information, this was set at $60,000 per year for investigation and $68,000 for rehabilitation which is inflation adjusted.

Using local contractors, approximately two and a half sub-catchments have been investigated and rehabilitation of one has been completed.

The investigation process also identified that maintenance had been very poor over a long time and merely cleaning the reticulation by removing silt, grit and rubble removed several overflow issues that had been around for more than 15 years.

The inflow and infiltration work will continue on this low key on a more or less sub-catchment by sub-catchment basis as originally envisaged. Other issues that arise quite often mean that work action has to be diverted and therefore actual programming is rather difficult because issues are resolve as they are found and often solving one problem can soak up the budget for the whole year.

SS Inflow & Infiltration Catchment Areas in Te Kuiti

Catchment	Total length of pipe (m)	Total length of pipe (m)	Pipe to be rehabilitated estimate in (m)	Comments
1	8,685	4,342	2,655	Cleaned and CCTV
2	2,495	2,495	832	Cleaned and CCTV done rehabilitation work nearly complete
3	3,630	3,630	1,210	
4	9,257		3,085	
4A		3,085		
4B		3,085		
5		5,599	1,866	Mostly cleaned and CCTV
6		4,453	1,484	
7		4,285	1,428	
8		7,428	2,476	

Figure 8.8: Te Kuiti Wastewater Reticulation –CCTV Investigation and Rehabilitation Progress 2012

The estimated cost of the required reticulation renewals for the Te Kuiti scheme over the next ten years (2018 – 2028) as determined from the available asset data available is $1.252 million, on top of the rehabilitation work estimated at $1.28 million for the same period. Sewers due for renewal during the next 10 years have been programmed to smooth expenditure. Also an amount of $150,000 over the 10 years of the LTP is estimated for minor reticulation renewal works that are required as asset investigation progresses mostly manhole replacement and or new manholes on sharp bends that are buried.

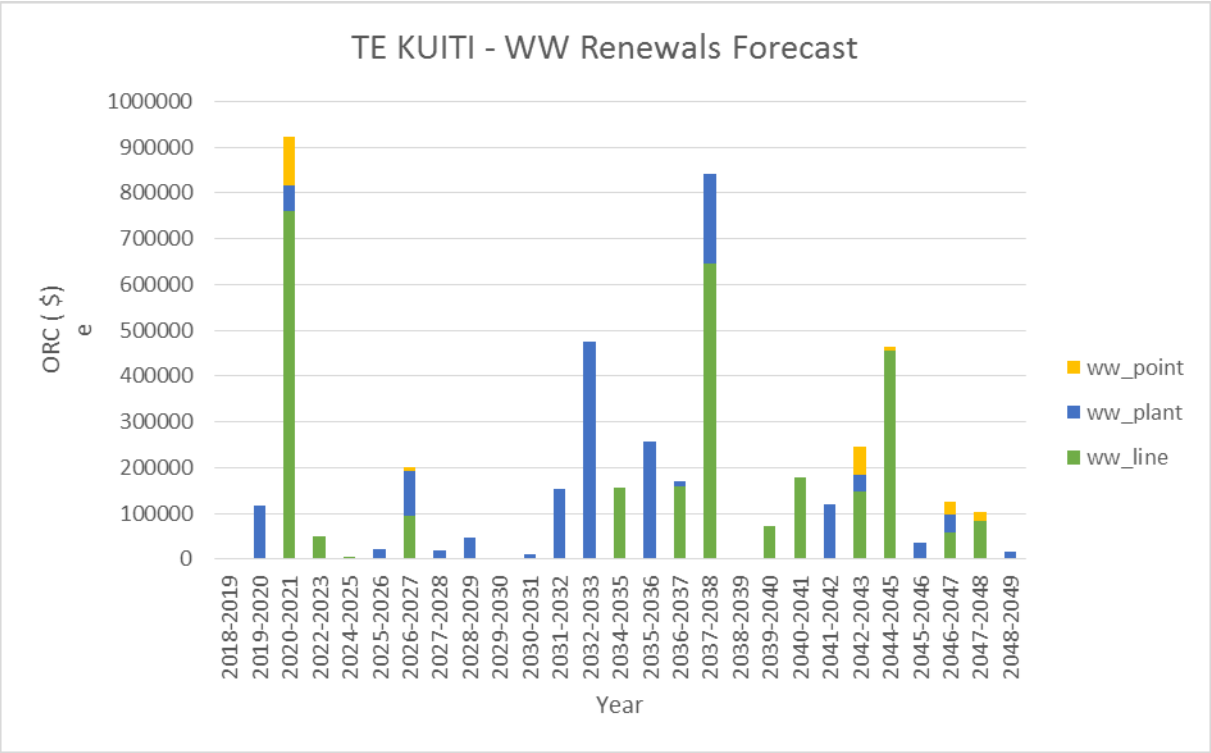


Figure 8.9: Renewals Forecast

Two of the small pump stations had been renewed. The other three are scheduled for renewal during the life of the 2018-28 LTP.

Deferred Maintenance

There are no specific works that are deferred but programmes had been slowed for affordability reasons like the Inflow and Infiltration project.

Development Programme

The upgrade of the Te Kuiti Wastewater Treatment Plant (WWTP) was completed in 2013/14 following a major process of design, Ministry of Health funding approval and consent renewal. The upgraded WWTP has since achieved higher effluent quality standards under challenging operating conditions.

The upgraded treatment plant was reconsented in 2015, with the current consent expiring 30 January 2040. The consented discharge volume is 7,000m^3 per day

The upgraded treatment plant capacity is limited by the design flow of the reactor and clarifier of 4,000 and 4,500 m3 per day respectively. Flows of up to 7,000 m3 per day can be handled for short periods during winter months, to the required consent standards.

Current average dry-weather inflow is 2,850 m^3 per day. Peak inflow is 8,500m^3 per day due to high inflow and infiltration (I/I).

Additional treatment plant capacity is dependent on the electrical supply. A higher rated transformer would be required before capacity could be increased beyond the above figures.

Given the low/declining population growth projections for Te Kuiti, there are no new development works planned over the duration of this AMP.

Disposal Programme

There are no Te Kuiti wastewater assets requiring disposal during the planning period.

8.7.2 BENNEYDALE WASTEWATER SCHEME

Asset Information

The Benneydale wastewater scheme was installed in 1942 by State Coal Mining. The wastewater treatment plant was constructed during the 1940's and at the time comprised a two stage treatment process consisting a septic tank primary treatment followed by a trickling filter tower as secondary treatment and discharged to a unnamed tributary of the Mangapehi Stream. This has since been upgraded and now discharges to the Mangapehi Stream via a small wetland. A new discharge consent was obtained in 2010 and includes the requirement for summer land disposal to protect water quality downstream of the point of discharge to Mangapehi Stream for recreational purposes. The land disposal area was constructed and has been in full use since the summer of 2011.

The septic tank is a three compartment reinforced concrete structure which is partially buried. It has several cast iron access covers for removing settled sludge as required.

Wastewater is pumped from the septic tank to the top of the trickling filter. The trickling filter is a 5m high by 3m diameter reinforced concrete tower filled with rounded stone media. The effluent is distributed over the media by a rotating distribution head. The treated effluent discharges via a number of holes at the base of the trickling filter from where it flows through a small wetland to the Mangapehi Stream during the winter. In the summer it discharges into a pump station and is pumped to a soakage field.

Following an extension of the reticulation in first half of 2011 about 90% of the community is now serviced, including a small business area. That includes all properties that could be reticulated on a reasonably economic basis.

The old scheme mainly consists of 150mm diameter asbestos cement pipes. There are 37 manholes in the old reticulation and three cast iron pipe bridges.

The recent extension was constructed using 150 mm diamtere PVC pipes only. The as-built plans for the new reticulation are have been prepared and are recorded in GIS.

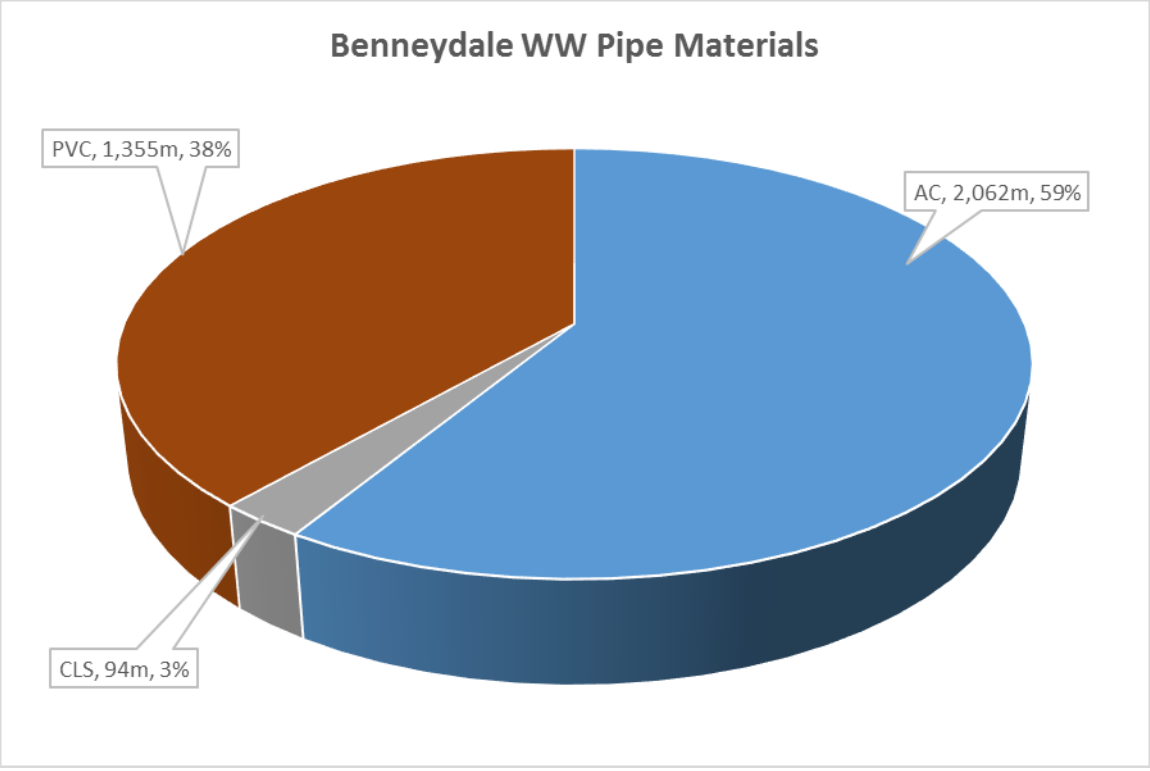


Figure 8.10: Pipe materials

The scheme has the following operational characteristics:

a.	Population served	240
b.	Peak daily flow	70 m^3/day
c.	Average daily flow	53 m^3/day
d.	Peak instantaneous flow	4.5 l/s
e.	Average $CBOD_5$	6 g/m^3
f.	Suspended solids average	10 g/m^3
g.	Enterococci count	300 /100ml
h.	Dissolved reactive phosphorus	5.5 g/m^3

The table below schedules the component assets of the Benneydale wastewater scheme.

Benneydale Wastewater Scheme	
Asset Type	**Asset Parameters**
Reticulation	Old section Pipelines: 2.2 km of predominantly AC pipes. Manholes: 37 concrete. New section Pipelines: 1.36 km of PVC pipes Manholes: 21 Manholes

Figure 8.11: Waste Water Scheme – Benneydale

Pump Stations	One pump station. This station is made up of the following components: • Electrical/control equipment • Structure • Pipe work/fittings • Dry well Pump
	Soakage field wet well pump station This station is made up of the following components: • Electrical/control equipment • Structure • Pipe work/fittings • Pump
Treatment	Concrete Imhoff Tank (3) 22m^3 each Trickling Filter 5m high x 3m diameter filled with rounded stone media Treatment Structures (Rotating Distribution head) 85m2 artificial wetlands
Ancillary	Flow meter on discharge structure
Soakage Field	4 – 20 x 30 m beds with feeder pump station
Discharge Consent Expiry Date	1 May 2025

Figure 8.12: Waste water Scheme

Benneydale Wastewater Treatment Plant

Asset Condition and Performance

The table below contains an assessment of the current condition and performance of the Benneydale wastewater assets using the grading standards adopted by the NZ Water Managers Group.

Asset	Asset Component	Condition Grading	Performance Grading	Condition Data Confidence	Year Installed	Estimated Age (years)	Expected Economic Life
Reticulation	Pipelines AC	4	3	D	1944	73	80
	Pipelines PVC	1	1	A	2011	6	120
	Old Service connections	3	3	D		Varies	80
	New Service Connections	1	1	A	2011	6	120
Pump Station	Electrical/control	2	3	A	2011	6	15
	Structure	3	3	A	1944	73	80
	- Ventilation	4	3	A	1944	73	80
	- Access	4	3	A	1994	23	80
	- Lighting	1	1	A	2008	9	20
	Pipe work/fittings	2	2	A	1944	73	80
	Pump	1	1	A	2008	9	20
	Pump	1	1	A	2011	6	20
Treatment	Imhoff Tank	3	1	D	1944	73	80
	Rotating Effluent Channel Renewed	3	3	A	2009	8	30
	Drive mechanism renewed	1	2	A	2009	8	15
	Treatment structures	3	2	A	1944	73	100

Figure 8.13: 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

23 = indicative replacement due within the next 10-year planning period

Reticulation
Inflow and infiltration is modest but needs to be addressed. The risk of pollution due to reticulation overflow is low although is does occur for short periods during very high rainfall events. If such overflow occurs it is directed through the wetland first.

Remaining Life	AC	CLS	PVC	TOTAL
0-10yrs	2157	0	0	2157
10-20yrs	0	94	0	94
>100 yrs	0	0	1,290	**1,290**
Total	**1,905**	**94**	**1,290**	**3,541**

Figure 8.14: Benneydale sewerage reticulation – age and material

Treatment
The Imhoff Tank and low rate biological (rock) filter are in reasonable condition for their age.

The plant has been restored to its original design with a small wetland added as agreed with local Iwi.

A soakage field had been added as required by new consent

The plant operation has been monitored using SCADA and telemetry since early October 2008.

Asset Performance
Environmental Standards
The risk of pollution events due to reticulation overflow is minimal.
Pipe bridges need attention due to deferred maintenance to avoid the risk of rupture and spillage into water courses and contamination a nearby stream.

Reliability
Pipe bridges need maintenance and some may need renewal.

CCTV inspection showed some repairs are needed which will maintain economic life for at least the 7 years remaining as shown in the asset data.

Treatment Capacity
The plant was originally designed for a flow of 165m^3/day for the then mining town.

The estimated discharge volume for the present town, if it was fully reticulated, is 85m^3/day.

With the decline in population of Benneydale the treatment plant is presently considered to be oversized for the community and this provides an extra level of security for possible growth. At the present time (2017) it is considered that there are no undersized assets in this scheme.

A small part of the Benneydale drainage area is not serviced by the current wastewater scheme because it is not economical. Those houses will remain on septic tanks. The sections are large and no issues are foreseen with grey water disposal.

Safety
The treatment plant is routinely assessed by the operations contractor for Health & Safety compliance.

Operations & Maintenance Programme

See Financial Summary (Section 10).

Provision for consent renewal is necessary in 2024/25. The operative consent expires 1 May 2025, with consent renewal application needing to be made by 1 November 2024.

Deferred Maintenance

Nil

Renewal Programme

CCTV inspection of old reticulation showed some repairs are needed which will maintain useful life for at least 15 years as shown in the asset data. On completion there will be no pipeline renewal requirement before 2025.

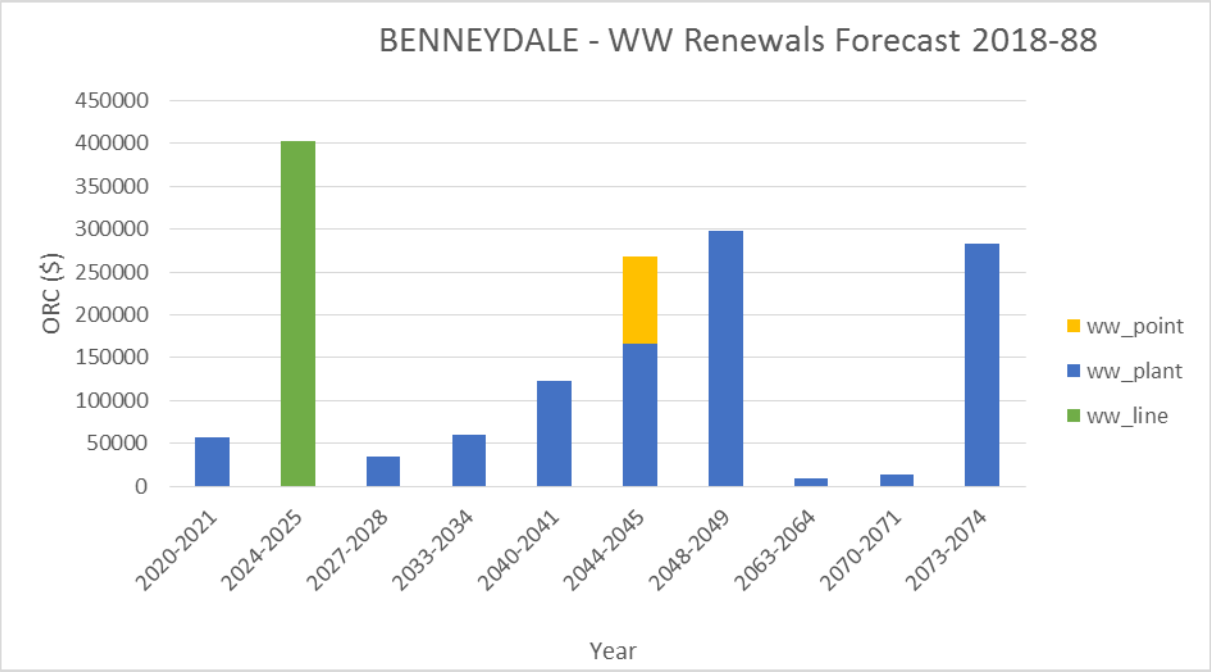


Figure 8.15 – Renewals Forecast

Development Programme

The wastewater system of Benneydale is in good condition and there is no development programme required for at least the next 10 years.

The next trigger for possible development (for higher LoS), if any, will be the at the renewal of the discharge consent in 2025

Disposal Programme

There are currently no assets targeted for disposal in the Benneydale scheme.

8.7.3 TE WAITERE SEWERAGE SCHEME

Asset Information

The Te Waitere wastewater scheme was installed in 1976. This scheme primarily consists of a sewerage network connected to septic tank outlets from a limited number of properties, with the reticulation taking it to a pump station from where it is pumped to a 20 x 28 m soakage field.

The operative resource consent expired in 2017 but was renewed for a 25-year period, expiring 31 July 2042

The operational parameters of the scheme are:

Te Waitere Wastewater Scheme	
Asset Type	**Asset Parameters**
Reticulation	Pipelines: Total length: 0.535km of 50 mm uPVC pipes.
Pump Station	One main pump station and an auxiliary pump station
Treatment	Individual septic tanks and community Soakage field 20 x 28m
Discharge Consent Expiry Date	31 July 2042

Figure 8.16: Asset Parameters - Te Waitere Wastewater Scheme

Asset Condition

The Table below contains an assessment of the current condition and performance of the Te Waitere wastewater assets using the grading standards adopted by the NZ Water Managers Group (Appendix B).

Asset Type	Asset Component	Condition Grading	Performance Grading	Condition Data Confidence	Date installed	Estimated Age (years)	Expected Economic Life
Reticulation	Pipelines (uPVC)	3	3	C	1979	38	80
	Pipelines (Steel)	4	3	C	1979	38	80
	Service connections	3	3	C	1979	38	80
Pump Station	Wet-well	2	3	A	1994	23	50
	Access Lid	4	4	A	1994	23	50
	MCC	3	3	B	1994	23	25
	Pump Control	2	2	B	1994	23	15
	Pump	2	3	A	1994	23	25
	Discharge Pipe	4	3	A	1994	23	25
	Guide Rails	2	3	A	1994	23	25
	Valve	4	3	A	1994	23	25
Treatment	Soakage field	5	5	B	1979	38	50

Figure 8.17: Asset Performance and Condition Grading – Te Waitere

Note: Condition & Performance 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 due within the next 10-year planning period
23 = indicative replacement date overdue

Provide for under Pump station renewals in indicative funding

Reticulation

The condition of the reticulation is assumed to be good due to the pipe material used, the low level of problems encountered in Te Waitere, and recent replacement programme.

The reticulation is of predominantly 63 OD mm polyethylene (PE) pipe, with some PVC and alkathene pipe. Further work is needed to update the age and condition data of the wastewater reticulation.

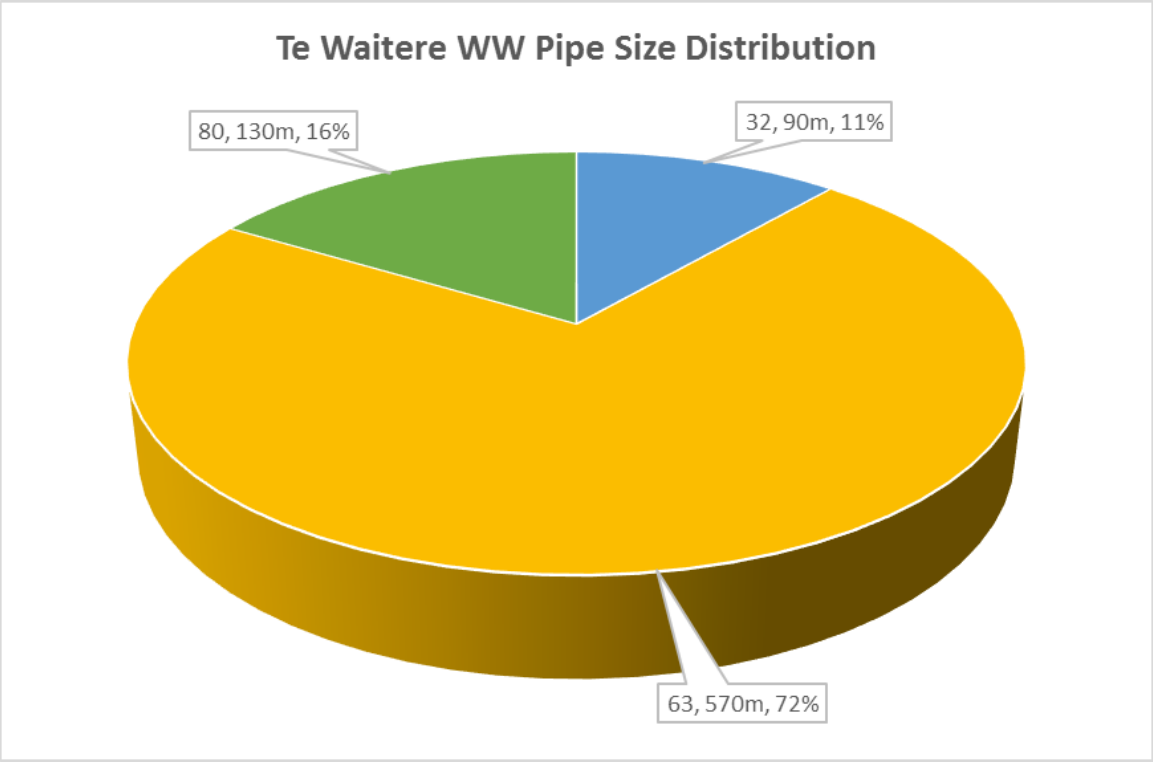


Figure 8.18: Pipe Size Distribution

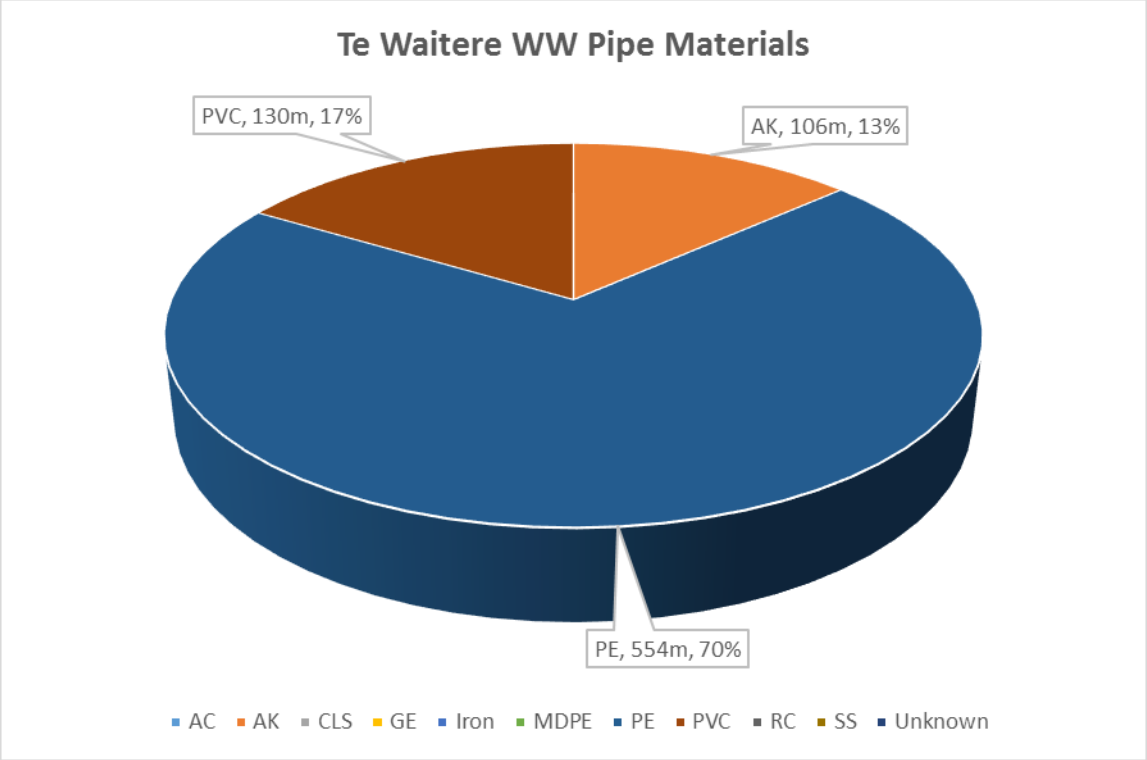


Figure 8.19: Pipe Materials

The grey-water pump station is programmed for refurbishment in 2017/18.

Treatment

Primary treatment takes place within private septic tanks on individual properties, from where the effluent is pumped to a soakage field located in private property. WDC access to the soakage field is protected by easement.

Asset Performance

There have been no recorded pollution events at this facility, though anecdotally overflows into the harbour do occur, due to power failure.

There are no records of reticulation failures, excluding the rising main.

Records show that the pump line to the soakage field has failed 4 times, twice in the 2007-2008 period due to ground movement. The worst affected section (about 100m) was replaced in 2009 with the balance completed since.

Environmental Standards
Discharge is to land. The Consent for 10.3 m^3/day expires in 2042. Discharge is an average of 1.6m3/day. However, the soakage field is perceived to be under stress and a detailed investigation is needed. It is expected that it will need to be reconstructed and expanded to work effectively and additional land will probably be required. This may require a new/varied discharge consent.

Reliability
There have been no recorded reticulation failures in the last 2 years since records have been kept. The septic tank has only caused problems when sludge levels have been allowed to build. This can be prevented by regular cleaning by the owners.

Capacity
The system has no capacity for increased demand without reconstructing/expanding the soakage field.

Safety

There are no safety concerns with this scheme other than what is identified and addressed during routine inspections.

Operations & Maintenance Programme

See Financial Summary (Section 10).

The introduction of new processes (see Section 9 - AM Improvement Programme) to record work tasks and costs will improve knowledge of operations and maintenance needs, and enhance the quality of decision-making.

A management plan for the scheme was prepared and submitted to Waikato Regional Council in 2017 in accordance with the new resource consent.

Deferred Maintenance

Nil

Deferred Renewals

Replacement of the rising main has been completed and refurbishment of the pump station was programmed for 2017/18. Investigation of options for rehabilitation/expansion of the existing soakage field has been programmed for 2019/20

Renewal Programme

Expenditure for Te Waitere wastewater scheme renewals over the next ten years is subject to the outcome of a geotechnical investigation into potential land surface instability. Apart from modest replacement programmes for pumpstation and electrical components, there is no reticulation replacement forecast before 2062.

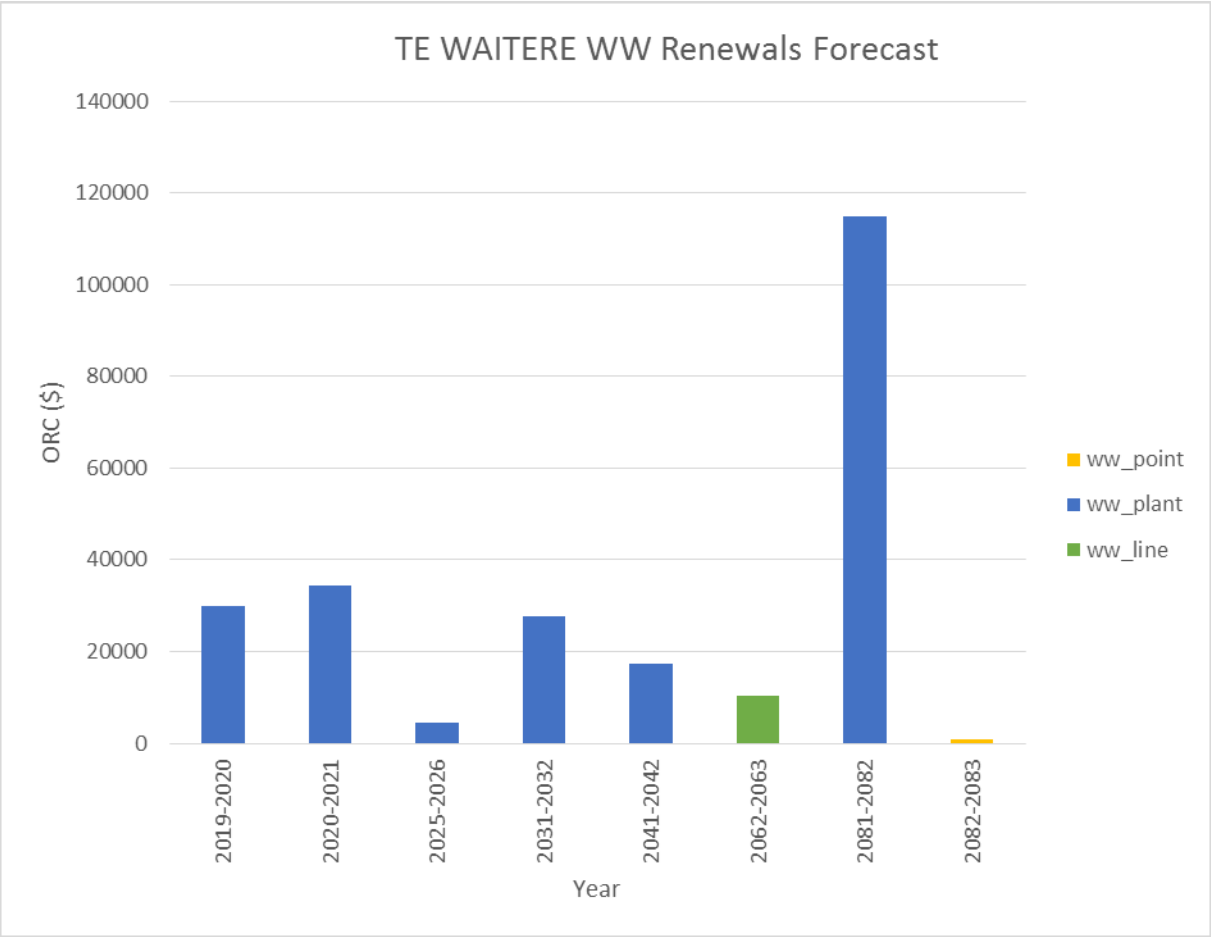


Figure 8.20 – Renewals Forecast

Development Programme

Te Waitere has previously been identified as a potential growth area in the district, subject to effective wastewater treatment and disposal. A number of subdivisions have taken place in recent years which will eventually impose increased pressure on the existing system.

Council has previously discussed (December 2008) a proposal to introduce a managed development plan for the Te Waitere area involving expansion of the existing scheme in two stages. The first stage could provide treatment and discharge capacity for an additional 50 dwellings, or equivalent, at the head of the peninsula. The second stage could provide for development of the inland portion of the peninsula.

Reticulation is currently, however, available to only a limited number of properties. Extending the scheme to connect with just the currently unserved properties will require additional land for extending the treatment bed area. New and/or modified discharge consents may be required for the additional discharge. The capacity of the grey-water collection tank may need to be expanded consistent with the above development proposal. It is expected that at least the pump unit and possibly its electrical supply would have to be upgraded. Funding has not been proposed for this. If the current demand increases, this could be addressed in the 2021 review of the 2018-28 LTP.

The operative consent contains a trigger mechanism for initiating investigations and development of a disposal strategy when and if the discharge volume exceeds the equivalent of 12 dwellings. There are currently (2017) 11 dwellings connected. Current discharge volumes are well below the trigger level, mainly because of the high incidence of absentee owners. The consent provides two years for implementation of the strategy from the trigger date. Provision for investigations in 2019/20, followed by redevelopment or upgrading of the current effluent disposal bed in 2021/22, has been proposed in the 2018 – 28 LTP.

Disposal Programme

There are currently no assets targeted for disposal in the Te Waitere scheme.

8.7.4 PIOPIO WASTEWATER SCHEME

Asset Information

A reticulated wastewater scheme for Piopio was constructed in 2012 following resolution of the necessary resource consent application to discharge treated effluent to a nearby stream (Mokau River). The new system replaced the privately owned and operated septic tank disposal areas within the community that were causing pollution problems due to overflows during high ground water levels, especially in winter. The reticulated sewerage system collects effluent from the septic tanks of individual properties. It comprises a small diameter pumped reticulation, modular treatment plant, and associated pump stations. The asset components of the planned scheme are summarised below:

Piopio Wastewater Scheme	
Asset Type	**Asset Parameters**
Reticulation	Various lengths of 25, 40, 50 90, ID MDPE
Pump Stations	207 domestic. 1 community.
Treatment	Packed bed reactor
Capacity	250 residential units. Remaining capacity (2017) for 23 additional residential properties.
Current discharge volume	Average: 86.2m3/d Peak: 305 m^3/d.
Consented discharge volume	Average: 135 m^3/d. Peak: 6 L/s.
Discharge Consent Expiry Date	Consent obtained December 2010. Expires 30 June 2028.

Figure 8.21: Asset Parameters- Piopio Wastewater Scheme

Fig. Piopio effluent outfall

Pipe diameter is predominantly 63 mm OD due to the nature of the small-bore, pressurised, septic tank effluent collection system.

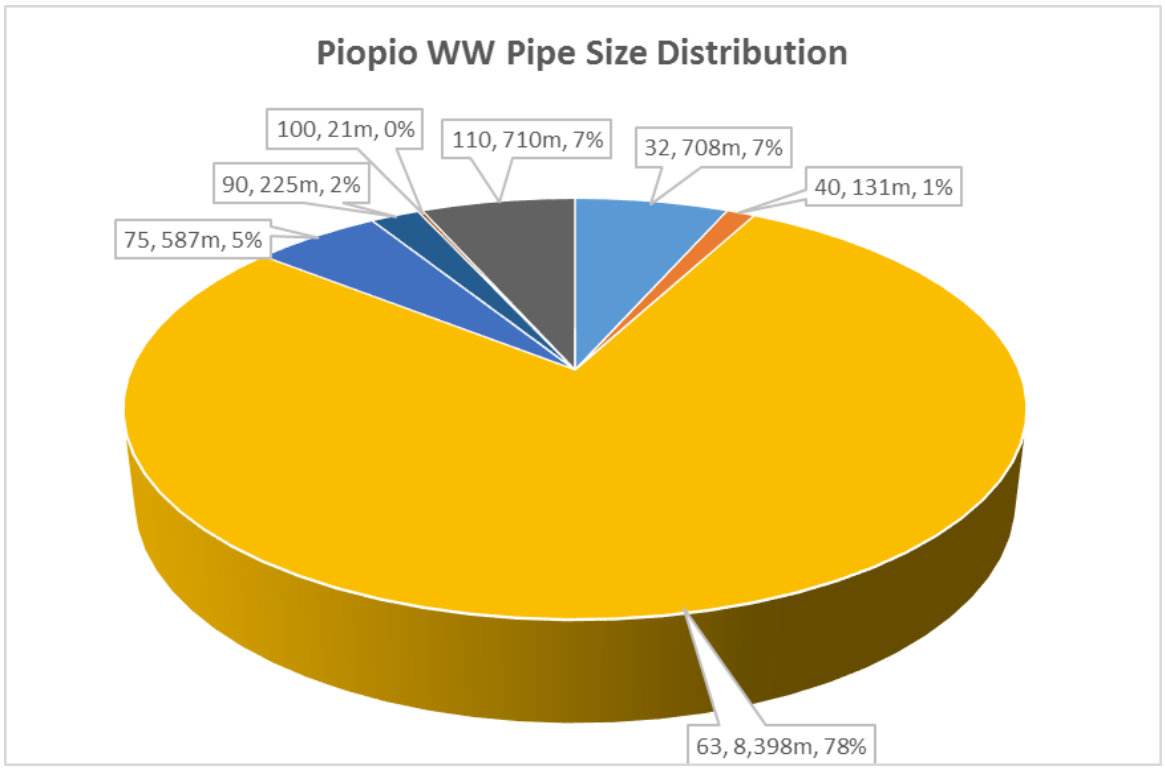


Figure 8.22: Pipe Size Distribution

Material type is almost completely medium density polyethylene (MDPE) pipe, corresponding to the small diameter bore.

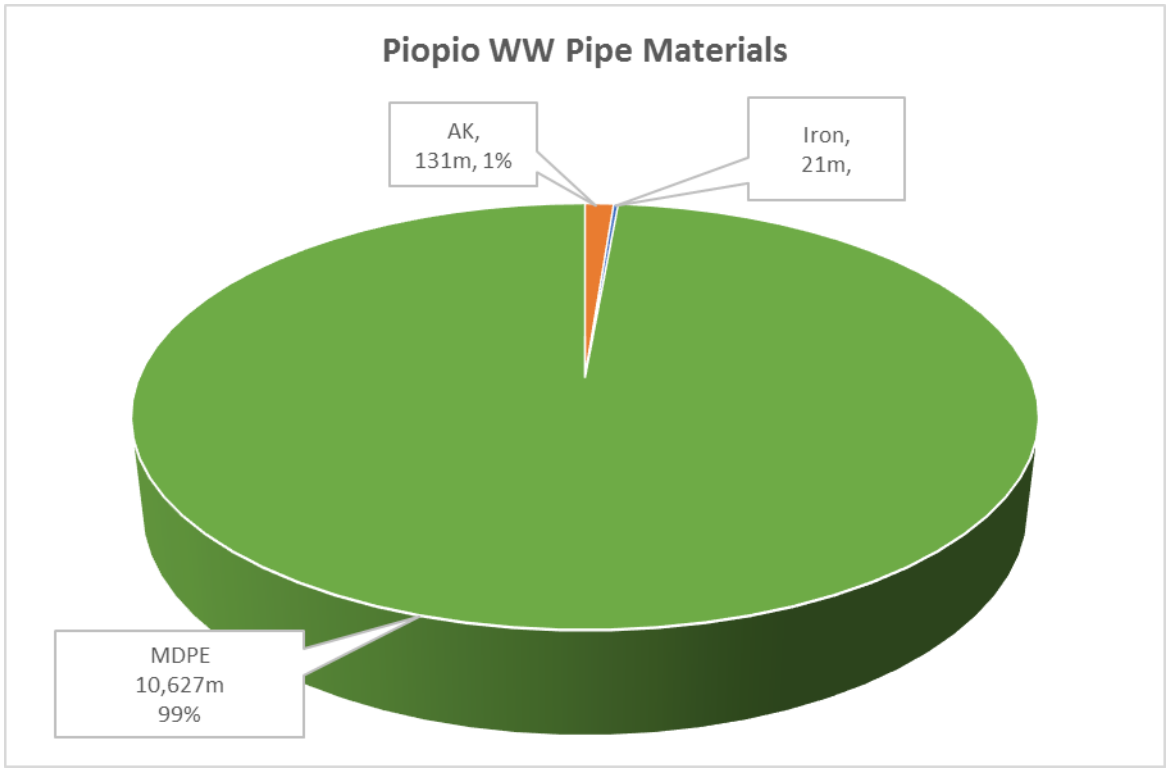


Figure 8.23: Pipe Materials

Operations & Maintenance Programme

The system was expected to have very little maintenance requirements as the pumping systems are automated. A six monthly inspection programme and annual maintenance programme was put

in place. However, additional routine maintenance involving regular cleaning of septic tanks has been necessary to avoid the incidence of blockages that was occurring, partly due to incorrect use of the system by property owners (discharge of fats etc.). An additional maintenance budget has been necessary to achieve the required levels of service.

Consent renewal occurs within the 2018-28 LTP period, with the operative consent expiring 30 June 2028. Monitoring and compliance reporting over the term of the current consent will be fundamental to the consent outcome, by demonstrating actual performance of the current operation against consent conditions. The latter are designed to mitigate any adverse effects of the discharge on the receiving environment, in this case Mokau River.

A number of sections of the reticulation are located on private land. It will be necessary to identify the affected properties and arrange the necessary easements to protect Council access requirements. Budget provision of $107,000 has been proposed over Years 1-7 of the 2018-28 LTP to give effect to the legal processes.

The Piopio WWTP is not fitted with SCADA, necessitating additional labour costs to manually inspect the WWTP. An automated SCADA system to enable distance monitoring and control of the site has been proposed ($10K pa over 5 years) for inclusion in the 2018-28 LTP.

Consent renewal falls due on June 2028, with application needing to be submitted by 30 December 2027.

Deferred Maintenance

Not applicable.

Renewal Programme

The renewal programme is limited to plant and equipment components of the scheme, having relatively short asset lives compared to the pipeline. Pipeline replacements are not applicable in the medium term due to the recent (2012) installation of the scheme.

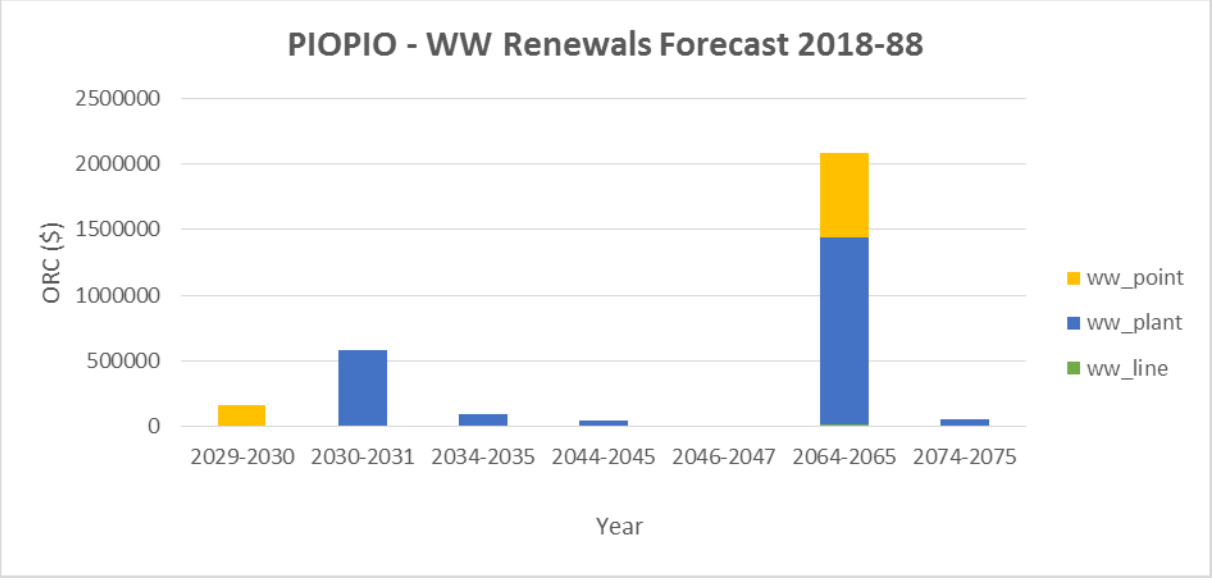


Figure 8.24: Renewals Forecast

Deferred Renewals

Not applicable.

Development Programme

There is no immediate development programme in place. The future residential population projection is forecast to increase by 20 over the 2018-48 planning period to a total population of

460. Dwellings are projected to increase to 239 – an increase of 44. The following scenario may develop and provides a concept for future action in the event that it does.

The wastewater system is designed for 250 residential unit's equivalent. There are an immediate 227 equivalent units connected, leaving spare capacity for 23 additional houses. There are 16 properties that contributed for several years to the original investigations and design but fell outside of the service area that was finally developed to reduce project cost. Assuming that in time these properties are also connected, that will leave a spare capacity of 7 residential or equivalent connections.

Future development in excess of the spare seven equivalent units will necessitate expansion of the whole system at Piopio. The options include extending the capacity of the existing site by adding the maximum number of treatment modules to give capacity for 50 more dwellings. A rough order of cost of this option is $2.7M plus GST. It includes provision for a consent variation to increase the discharge volume, and allowance for possible land disposal, given the small but determined level of opposition to the current riverine discharge consent.

An alternative and perhaps more feasible option might be to construct an additional new plant on a separate or adjacent site to a design capacity of 180 additional residential equivalent units. The land and treatment plant would be sized for a combined capacity of 500 residential equivalent units (persons). The estimated cost of this option, including land disposal ($2M), is $5M plus GST.

Given the newness of the scheme, future costs within the planning period are confined to operating and maintenance activities, as summarised in the Financial Summary (Section 10).

8.7.5 OTHER AREAS

Mokau- Awakino

Asset Information
The community of Mokau - Awakino currently has no community owned wastewater scheme and it is known that the existing septic tanks within the community are causing pollution problems in some areas due to inadequate soakage available for septic tank effluent due to property density.

Properties adjacent to coastal waterways require an on-site treatment system.

Mokau – Awakino has been identified as a growth area in the district with a managed development plan concept to be developed. A reticulated wastewater (and upgraded water supply) scheme should form part of this concept.

Provision has been made to investigate and report on design options over 2030-32 at a budgeted cost pf $110,000. The preliminary estimated cost if the scheme is $23,600 plus GST.

Kiritehere wastewater

Asset Information
The community of Kiritehere currently has no community owned wastewater scheme. Properties adjacent to coastal waterways require an on-site treatment system.

Minor growth has occurred at Kiritehere but is not sufficient to warrant investigation of wastewater infrastructure during the term of this AMP.

Marokopa wastewater

Asset Information
The community of Marokopa currently has no community owned wastewater scheme and it is possible that the existing septic tanks within the community may be causing pollution problems due to inadequate soakage available for septic tank effluent during the holiday season.

Properties adjacent to coastal waterways require on site treatment system.

Marokopa has been identified as a growth area in the District with a managed development plan concept to be developed. A reticulated wastewater (and upgraded water supply) scheme should form part of this concept.

There is no provision for any work on the above during the term of this AMP.

Aria Community

Asset Information
The Aria community is serviced by privately owned, individual property septic tanks. Some risk is present due to poor effluent soakage that may be affecting the environment. It is not intended to install a community scheme within the planning period.

Taharoa Community

Asset Information
The Taharoa community is serviced by individual property septic tanks, and some risk is present due to poor effluent soakage, that may be affecting the environment. It is not intended to install or assume responsibility for a community scheme within the planning period.

SECTION 9 - ASSET MANAGEMENT PRACTICES

9.1 INTRODUCTION

This section outlines the decision making systems that Council currently use to determine long term maintenance, renewal and capital expenditure requirements for wastewater assets.

This section looks at three broad areas of activity:

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

9.2 CURRENT ASSET MANAGEMENT PROCESSES

Activity	Strategy
Service Delivery	Contracts are let for the delivery of minor repair work, major repair, rehabilitation, renewal, upgrading and development work. The day to day system operation and inspection is undertaken by WDC staff. Reticulation maintenance is undertaken by contractors on an agreed rates basis. Treatment plant operations are undertaken by Council staff. Capital works are undertaken on a competitive, arm's-length basis, dependent on the value of work.
Safety Management	A formal safety management system is an integral component of effective service delivery, with the WDC Safety Management System (SMS) adopted by the Council on 31 January 2007 (Resolution No. 01/07). The resolution records an agreement between WDC and NZTA for work carried out on the road that the SMS is endorsed by both parties as being in accordance with the NZTA *Guideline for Developing and Implementing a SMS for Road Controlling Authorities.* Copy of the SMS can be found on the Council's Intranet under the page headed Operations.
Financial Control Procurement	The financial management system is used to record the cost of each work activity for comparison with budget and financial control. Payments made to contractors relate to each contract. Council's procurement policy for wastewater capital works shadows the NZTA Competitive Pricing Procedures, linked with Council's delegations manual. Physical works having a value greater than $20,000 are tendered using a range of competitive pricing options. Works valued at under $20,000 are market priced using an expedited procedure requiring a minimum of three invited quotations. Where experience over the previous 13 months indicates that 3 or more quotes cannot be obtained, quotations may be obtained from contractors able to do the work that have been identified by the advertising in the last 13 months. Wastewater works having a value less than $20,000 may be let using any procedure (including negotiation) that assures a satisfactory and competitive price. Expedited procedures may be applied to emergency works within set criteria. Professional services contracts for waste water works may follow the same tendering process as for physical works. Contracts valued less than $20,000 may follow a simplified evaluation method. Any tender procedure (including negotiation) may be followed for contracts having a value less than $10,000. Decisions on budgeted capital works can be decided by a Tenders Committee made up of senior management. Projects above the value of $100,000 are specifically reported to Council.
Performance Monitoring	Records are kept of audited activities, forward and completed maintenance program.
Condition	Preventative maintenance inspections are routinely undertaken by Council contractors and

Activity	Strategy
Monitoring	staff to monitor the condition of wastewater assets. In addition the condition of the pipe networks is measured by CCTV surveys on a programmed basis. Site inspections are undertaken to assess the condition of infrastructure where performance is outside the targeted level of service.
Quality Assurance	Audit procedures are defined for controlling the quality of data received from external contractors for condition assessments. Data from maintenance contractors is received for work activity, cost, and attribute and spatial data for physical works.
Maintenance/ operations	Data from maintenance contractors is received for work activity, cost, attribute and spatial data relating to physical works for loading into Bizeasset.
Optimised life cycle strategy	Asset maintenance and renewal decisions are based on an assessment of asset age, asset condition and performance information. Decisions are currently optimised by considering life cycle costs, latest technologies and professional judgment. Decisions are outcome focused to allow for advances in technology in design and material selection.
Risk Management	Risk management is practiced both formally and informally. Judgments are made based on the knowledge of experienced staff and AS/NZS 4360 guidelines.
Staff Development	Council is a member of SOLGM, the NZ Water and Wastes Association, IPWEA NZ and other sector groups. Industry specific training courses are occasionally attended by relevant staff to maintain continuous education.

Figure 9.1: Current Asset Management Processes

9.3 ASSET MANAGEMENT SYSTEM

Council operates a hybrid asset management tool known as 'BizeAsset' Asset Management System. 'BizeAsset' was designed for small to medium sized councils to meet the asset management requirements of local government. 'BizeAsset' uses a GIS platform with a web-front end to maximise efficiency and simplicity. The system is easy to maintain with powerful outputs such as asset valuations, maintenance history, map production, etc. Council currently uses 'BizeAsset' modules for wastewater (sewerage), water, and stormwater infrastructure. The 'BizeAsset' functionality currently utilised within these modules is asset register, accounting (asset valuation), maintenance history ('maintenance event' not 'maintenance cost') with predictive analysis mooted for the future.

9.4 ASSET MANAGEMENT DATA

9.4.1 Asset Attributes

Moderate records of the networks exist; significant service areas are identified and recorded by location and type with spatial attributes. Attribute data for wastewater assets is stored in the inventory database. The information available is known to be incomplete and of variable accuracy. A comprehensive program to address this is not affordable; asset data improvement happens as part of everyday operations and maintenance activities.

The efficient operation of waste water assets is supplemented by the knowledge and judgment of experienced staff.

9.4.2 Condition Data

Condition information available on wastewater assets is evolving with renewal decisions based on age, condition and performance assessments and the renewal selection criteria included in the lifecycle management section above.

9.5 MONITORING AND CONTROL

Following the DIA (Department of Internal Affairs) investigation of WDC's operations in 2006, it become apparent that there had been no consent reporting and very basic WINZ (Water Information NZ) data reporting and what was done for WINZ did not meet the compliance criteria most of the time. The main reasons were the data was not available or it was inaccurate.

The first step was to install flow meters at the various plants (wastewater and water supply) to get meaningful operational data (extraction, discharge volumes etc.) that required a reliable SCADA and telemetry system

Telemetry is a technology that allows remote measurement and transparent conveyance of remote information and the storage and collation to be in a format that can be used for reporting purposes to meet the various regulatory criteria.

SCADA (supervisory control and data acquisition) generally refers to industrial control systems (ICS): computer systems that monitor and control industrial, infrastructure, or facility-based processes. WDC needed such system to monitor and control its infrastructure processes water treatment and distribution, wastewater collection and treatment.

A programme to collect flow data was needed but it was recognised that it needed to be much more than just that. A system that could provide the information that is needed and allowed remote intervention in case of emergency on a district wide basis was scoped.

For such a system to work, all the parts and their functions as developed at the various plants pump stations, over time, needs to be fully integrated. If not, it will simply not work.

Experience with various systems and contractors in this field were pooled and considered and the main criteria determined were;

- Real practical understanding and experience with the control and data acquisition and transfer in the broad water industry
- Reliability of both contractor and the systems offered
- Flexibility that allows for development as infrastructure gets upgraded to meet regulatory requirement and changes in requirements over time
- Honesty and integrity in all dealings
- Support at all times

Considering all of the above a proposal from Alf Downs was considered and accepted in early 2008.

The roll out of this SCADA and telemetry scheme has proved itself and is used in some form at all the treatment plants, pump stations and reservoirs as well as collecting trade waste flow data. In the wastewater system, at its most basic is the management of secondary pump stations.

Typical controls and data collection at a secondary pump station;

- Start and stop pumps and increase or decrease pump rate based on inflow or demand
- Send out alarms when pumps fail or tanks get too low of too full (overflow prevention)
- Collect and record all of this data and store for operational and asset management and reporting

The wastewater treatment plant at Te Kuiti is a sophisticated plant of necessity because of the composition and high variability of incoming waste. The management of the treatment processes in this plant can only be done with accurate reliable data that is continuously collected and interpreted to manage the next process in the process train. That in turn is totally dependent on reliable equipment, programming and support.

As an example:

The first set of controls and data collection at the Te Kuiti WWTP manage the inflow to the plant. The Te Kuiti WWTP requires smoothed inflow to operate most effectively. It also cannot process more than 4,000m^3 per day. Therefore the main pump station must pump continuously but at the same time the flow meters on the pumps calculate in advance how much the electronic control gate at the inlet to the plant (1 kilometre away) allows through so that at the end of 24 hours no more than 4,000m^3 has gone into the plant for processing. Any excess (due to high rainfall) is bypassed which then is pumped back to the inlet of the plant when the flow into the plant is calculated to drop below 4,000m^3 for the day to create storage for the next rainfall event. This may sound simple but is in effect a highly sophisticated subsystem in the total SCADA and telemetry system and probably the least complicated compared to controlling the actual treatment processes.

SECTION 10 – FINANCIAL SUMMARY

10.1 VALUATION OF WASTEWATER ASSETS

Wastewater asset types and values are stored in BizeAsset and the values as at 30 June 2015 have been used to determine optimised replacement cost and disposal values where relevant. Infrastructural asset valuations are determined/peer reviewed every three years by an independent valuer. The next review is due in 2018. Additions to the infrastructural assets are valued at cost less accumulated depreciation.

The key components of WDC's wastewater infrastructure and their attendant values, as at 30 June 2015, are summarised in the table below:

Scheme	Asset Type	Optimised Replacement Cost	Optimised Depreciated Replacement Cost	Accumulated Depreciation	Annual Depreciation
All	Consents	1,817,922	1,644,743	173,179	71,840
Te Kuiti	Plant	15,499,159	14,659,670	839,488	423,498
	Pipes	11,468,318	6,310,551	5,157,766	121,200
	Points	2,627,371	1,536,487	1,090,884	26,285
	S/T	29,594,848	22,506,708	7,088,138	570,983
Piopio	Plant	1,649,394	1,541,792	107,602	36,061
	Pipes	1,150,467	1,119,453	31,014	9,772
	Points	819,472	746,446	73,026	24,463
	S/T	3,619,333	3,407,691	211,642	70,296
Benneydale	Plant	1,167,749	890,801	276,948	24,103
	Pipes	708,124	328,257	379,867	7,713
	Points	177,998	101,052	76,946	1,780
	S/T	2,053,871	1,320,110	733,761	33,596
Te Waitere	Plant	232,639	126,464	106,175	3,271
	Pipes	84,007	77,152	6,855	822
	Points	4,112	3,629	483	41
	S/T	320,758	207,245	113,513	4,134
TOTAL		37,406,732	29,086,497	8,320,233	750,849

Figure 10.1: Wastewater Infrastructure core components

The assets were valued using the Depreciated Replacement Cost methodology as described in the NZ Infrastructure Asset Valuation and Depreciation Guidelines. Assets were depreciated on a straight line basis to determine the Optimised Depreciated Replacement Cost – see the Valuation Certificate and schedule of the effective lives used, in the appendices.

10.2 VALUATION CONFIDENCE RATINGS

The data confidence ratings for each of the significant asset components valued is:

Data Attribute	Confidence Grade							
	All data estimated		Significant data estimated		Minor inaccuracies		Accurate	
Asset Type								
Physical Properties								
Location								
Age								
Deterioration Rate								

Figure 10.2: Valuation Confidence Ratings

10.3 STRATEGY FOR FINANCIAL FORECAST

The strategy applied to the financial forecast was to:

- Assign realistic timing to projects given the resources available under 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
- Reduce the completion backlog of works recently identified and currently approved.

The following table shows the financial projections for the wastewater activity over the ten years corresponding to the 2018-28 LTP. The following definitions apply to the respective activity classes:

Activity Class	Definition
Maintenance and Operations	All actions necessary to retain an asset as near as practicable to its original condition, but excluding renewals and rehabilitation. Includes costs such as insurances, rates, energy and consumables associated with owning and using the asset
Renewals	Works to upgrade, refurbish or replace existing assets with assets of equivalent capacity or performance capability
Improvements	Expenditure used to create new assets or to increase the capacity of existing assets beyond their original design capacity or service potential. Improvements increase the value of asset stock

Figure 10.3: Activity Class

Figure 10.4: Sewerage operational, renewal and capital costs corresponding to the 2018-28 LTP period

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											
Waitomo Sewerage	0	0	0	0	0	0	0	0	0	0	0
Te Kuiti Sewerage	(860,000)	(850,000)	(871,250)	(864,600)	(858,400)	(879,200)	(901,600)	(924,000)	(948,800)	(975,200)	(1,002,400)
Te Waitere Sewerage	0	0	0	0	0	0	0	0	0	0	0
Benneydale Sewerage	(1,200)	(1,000)	(1,025)	(1,048)	(1,073)	(1,099)	(1,127)	(1,155)	(1,186)	(1,219)	(1,253)
Piopio Sewerage	(1,600)	(8,800)	(9,020)	(9,222)	(9,442)	(9,671)	(9,918)	(10,164)	(10,437)	(10,727)	(11,026)
	(862,800)	**(859,800)**	**(881,295)**	**(874,870)**	**(868,915)**	**(889,970)**	**(912,645)**	**(935,319)**	**(960,423)**	**(987,146)**	**(1,014,679)**
Direct Expenditure											
Waitomo Sewerage	0	5,000	5,125	5,240	0	0	0	0	0	0	0
Te Kuiti Sewerage	1,548,905	1,460,044	1,488,247	1,553,322	1,573,203	1,632,791	1,651,322	1,679,786	1,725,812	1,828,562	1,843,685
Te Waitere Sewerage	39,665	40,508	41,708	42,869	43,323	44,641	46,432	47,266	48,625	49,907	50,680
Benneydale Sewerage	118,272	107,736	110,751	113,620	115,359	118,612	122,751	125,255	128,771	132,234	134,864
Piopio Sewerage	159,978	147,484	151,579	155,468	157,942	162,351	167,909	154,061	158,393	162,646	165,838
	1,866,820	**1,760,772**	**1,797,409**	**1,870,519**	**1,889,827**	**1,958,395**	**1,988,414**	**2,006,367**	**2,061,601**	**2,173,349**	**2,195,067**
Indirect Expenditure											
Allocated Costs	237,506	212,149	219,129	222,388	227,272	234,165	244,118	251,702	258,310	261,174	267,478
Depreciation	780,795	777,842	795,696	810,205	824,575	839,845	850,088	861,615	869,251	876,141	883,222
Interest	524,739	480,588	498,917	504,538	510,657	545,449	534,337	512,751	475,602	434,598	390,084
	1,543,040	**1,470,579**	**1,513,742**	**1,537,130**	**1,562,503**	**1,619,459**	**1,628,543**	**1,626,068**	**1,603,163**	**1,571,913**	**1,540,784**
Net Cost of Service	**2,547,060**	**2,371,551**	**2,429,856**	**2,532,778**	**2,583,415**	**2,687,884**	**2,704,313**	**2,697,116**	**2,704,342**	**2,758,115**	**2,721,172**
Capital Expenditure											
Waitomo Sewerage	0	0	0	0	0	0	0	0	0	0	0

Te Kuiti Sewerage	535,857	622,121	488,034	605,308	528,475	475,276	487,303	308,775	316,986	325,733	334,729
Te Waitere Sewerage	0	0	15,375	26,200	0	0	0	0	0	0	0
Benneydale Sewerage	52,312	52,300	53,608	13,100	13,413	13,738	14,088	37,538	14,825	15,238	15,663
Piopio Sewerage	30,928	19,400	30,135	30,811	31,546	32,311	33,134	22,407	23,008	23,649	49,368
	619,097	**693,821**	**587,151**	**675,419**	**573,434**	**521,324**	**534,524**	**368,719**	**354,819**	**364,620**	**399,760**
Net Expenditure	**3,166,157**	**3,065,372**	**3,017,008**	**3,208,198**	**3,156,849**	**3,209,208**	**3,238,837**	**3,065,836**	**3,059,161**	**3,122,735**	**3,120,932**
Funded By											
Reserves	(541,007)	62,300	20,758	2,649	130,041	(31,048)	(32,221)	(41,944)	(9,833)	1,114	(14,031)
Internal Loans	(210,517)	(622,121)	(488,034)	(605,308)	(528,475)	(475,276)	(487,303)	(308,775)	(316,986)	(325,733)	(334,729)
Total Rates	(2,414,633)	(2,505,551)	(2,549,731)	(2,605,538)	(2,758,415)	(2,702,884)	(2,719,313)	(2,715,116)	(2,732,342)	(2,798,115)	(2,772,172)
	(3,166,157)	**(3,065,372)**	**(3,017,008)**	**(3,208,198)**	**(3,156,849)**	**(3,209,208)**	**(3,238,837)**	**(3,065,836)**	**(3,059,161)**	**(3,122,735)**	**(3,120,932)**

Financial projections for the full 2018-48 period covered by this AMP can be found in Appendix 0.

Council funding approval is required for all work programs identified in this plan, and the timing and scope of the works may differ from that shown. Generally the initial three year period of the LTP provides reasonably robust expenditure estimates whilst the remaining seven years are considered to be more indicative due to the absence of detailed design work, price variability over time, and changes in levels of service at both a technical and customer level. The estimates and timing of projects beyond the first 10-years are indicative only.

The following notes apply to the expenditure forecasts:

- All estimated expenditure is in dollar values as at 30 June 2018 with no allowance made for inflation over each subsequent year of the 30 year planning period.
- 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 wastewater 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 wastewater schemes over the 2018-48 period
- Resource consents required for any planned wastewater 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 wastewater scheme in this AMP.

In summary, the overall wastewater forecast for the next 10 years identifies:

- Operational and maintenance costs increase steadily across all schemes in line with inflation adjustments.
- Additional O & M costs are due to increased routine servicing of mechanical and electrical plant, plus additional chemical dosing, at the Te Kuiti WWTP, and additional preventative maintenance at the Piopio scheme.
- Renewal costs fluctuate between schemes with non–operational expenditure smoothing applied in all cases to avoid major spikes in overall expenditure for each scheme from one year to the next. Major renewals expenditure in Te Kuiti due to poor pipe condition, manifesting as high inflow/infiltration may be required. The work planned for detailed surveys of the reticulation will confirm the scope and cost estimate of the work required.

10.4 FUNDING SOURCES

Current funding sources available for the wastewater activity include rates and trade waste charges:

10.4.1 Rates

Rates are charged to all properties that can connect to WDC's wastewater systems.
Trade waste charges are charge in line with WDC's Trade waste Bylaw and trade waste agreements.

10.4.2 Assistance for smaller communities

Council's Revenue and Funding policy also makes provision for assistance for smaller communities where wastewater services are an imperative because of public health, environmental or economic

factors, but the costs of providing the service is not financially viable due to the small size of the community. The trigger point for application of this policy is when the cost per connection to an existing wastewater scheme exceeds $1100 including GST.

The communities eligible for this assistance currently include.

- Te Waitere
- Benneydale
- Piopio

The assistance is in form of a targeted uniform annual charge over every rating unit within the District.

10.4.3 Trade waste charges

Trade waste charges are charged in line with Council's Trade waste Bylaw and specific trade waste discharge consents.

10.4.4 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 or additional asset capacity provision identified 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.

Council has a financial contributions policy, as included in its operative district plan but not a development contributions policy.

Financial contributions can be applied as an appealable condition on 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 contributions to be charged where necessary, but remains untested. This stance reflects an unwritten policy of encouraging economic development by not applying the financial contributions policy to new developments. Any need for growth related expenditure will be at the expense of existing ratepayers.

SECTION 11 - ASSUMPTIONS

The following 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 involves a process of continuous 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

		Relative Priority								
Ref	**Description**	**1**	**2**	**3**	**4**	**Target Completion Date**	**Resources Required**	**Additional Resources Approved**	**Actual Completion Date**	**Comment**
1	Consultation to ascertain the community's service needs and preferences and to ensure their views is considered when selecting the best level of service scenario.			x		May 2020	Survey consultant		On going	LOS resident survey completed in 2017 confirmed wastewater services meet or exceed he majority of users expectations
2	Ensure the right level of funding is being allocated to maintain the asset service potential.		x			Next review September 2020	Water Services Manager			Review frequency consistent with annual and long term planning cycle
3	Formalise asset data collection procedures for Council staff and contractors.	x				On going	Water Services Manager			
4	Investigate a design concept for a wastewater scheme to service planned development at Mokau - Awakino				x	2030-32	District Plan review consultant			Require District Plan update
5	Investigate extension of the Te Waitere scheme to facilitate further development of the area.				X	2019/20				Informed by 2017 District Plan review.
6	Develop accurate and complete asset inventory registers for each scheme.		x			On-going	Water Services Manager			

		Relative Priority								
Ref	**Description**	**1**	**2**	**3**	**4**	**Target Completion Date**	**Resources Required**	**Additional Resources Approved**	**Actual Completion Date**	**Comment**
7	Updating of asset inventory data and input to database.	x				On-going	Water Services Manager & AM Officer			
8	Prepare and refine desktop assessment of asset remaining life using CCTV and inspection records. Prepare	x								
9	Complete external audit and review process for data integrity		x			After completion of 6 and 7	Dedicated staff			Require accurate asset inventory
10	Develop a greater focus on risk identification and management, obtaining more detailed information on critical assets.		x				Dedicated staff			
11	Prioritise the mitigation works developed from risk assessment exercises.		x				Dedicated staff			
12	Develop strategies to meet the community's desire for higher environmental standards and anticipated more stringent resource consent requirements.		x			Specific to each consent renewal.	Dedicated staff			
12	Undertake a new assessment of water and sanitary services available to communities in the district			x		Dec 2020	External advice			Assessment in accordance with s.125 of the LGA 2002. The most recent assessment was completed in 2014.

		Relative Priority								
Ref	**Description**	**1**	**2**	**3**	**4**	**Target Completion Date**	**Resources Required**	**Additional Resources Approved**	**Actual Completion Date**	**Comment**
13	Arrange a routine forum of adjacent council's wastewater officers to discuss trends, concerns, future developments that may affect neighbouring authorities, cost sharing of consultants or specialist providers, spare survey or design capacity in larger councils shared by others.				x	Ongoing	Nil			Informal networking already occurs on a regular basis

Key:

1 = High importance/high urgency
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 Wastewater Asset Management Plan:

- Water Services Assessment – Opus International Consultants 2014
- Waikato Regional Plan
- Miscellaneous consultant reports
- Customer Satisfaction Surveys 2009 – 2017

SECTION 14 - APPENDICES

Appendix	Title
A	Glossary
B	Extract from LGA 2002 – s.101B Infrastructure Strategy
C	Wastewater Risk Assessment
D	Forecast Wastewater AMP Expenditure Programs 2018 – 2048
E	WW Proposed Renewal Programs
F	Effective Lives of Wastewater Assets
G	Extract from Environment Waikato Regional Plan - Discharge of biosolids and sludges or liquids from activated sludge treatment processes to land
H	Extract from Environment Waikato Regional Plan Rule 6.1 – Air discharges from solid or liquid waste management processes
I	Extract from Environment Waikato Regional Plan – Discharges to Water

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 Asset Management (AAM)	Asset Management practice that has evolved to a state that matches business needs. AAM employs predictive modeling, 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.
Asset 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.
Asset Management strategy	A strategy for Activity Management covering, the development and implementation of plans and programmes 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 Asset 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: WASTEWATER RISK ASSESSMEMT

Wastewater Risk - Reticulation

Risk Description	Consequence		Likelihood	Risk Rating	Best Management Option	Consequence when managed		Likelihood	Managed Risk Rating	Action Plan
Partial blockage of flat grade sewers	Surcharge of sewers and overflows	**3**	**8**	High	Prepare and carry out programme for routine flushing	Much reduced risk of overflows	**2**	**4**	Low	**B**
Infiltration and Inflow to sewers from residential sewer connections	Surcharge of sewers and overflows	**3**	**10**	High	Initiate a long term I/I investigation and reduction programme	long term reduction in overflows	**2**	**5**	Moderate	**B**
Blockage of river crossing siphon	Overflow to Mangaokewa River	**4**	**4**	High	Prepare and carry out programme for routine flushing	Much reduced risk of overflows	**4**	**1**	High	**B**
Failure of AC sewers from meat works plant effluent	Structural failure of specific sewers	**4**	**5**	High	Routine inspection of specific sewers and possible dedicated effluent pipeline	Much reduced risk of failure	**4**	**1**	High	**B**
Failure of main PS rising main	Overflow to Mangaokewa River	**5**	**7**	Extreme	Renew rising main	No reduced level of service	**2**	**2**	Low	**A**
Insufficient capacity of trunk sewers from meat works	Surcharge of sewers and overflows	**3**	**6**	Moderate	Investigate flow capacity and upgrade where required or construct dedicated effluent pipeline	Much reduced risk of overflows	**2**	**2**	Low	**C**
Collapse of Benneydale pipe bridge	Discharge to stream and WRC action	**3**	**7**	High	Investigate pipe bridge structure and implement a repair programme	Much reduced risk of discharge	**3**	**2**	Moderate	**B**
Collapse of Te Kuiti bridge pipe crossings	Discharge to river and WRC action	**3**	**5**	Moderate	Investigate bridge pipe supports and pipe condition structure and implement a repair programme	Much reduced risk of discharge	**3**	**2**	Moderate	**C**
Enforced restriction on meat companies discharge due to WRC abatement notice	Compensation to companies and /or reduction in company investment	**4**	**5**	High	Discussion with meat companies and WRC regarding mitigation factors and crucial issues	An awareness of the issues and specific management plans	**4**	**5**	High	**B**

Wastewater Risk – Treatment Plants

Risk Description	Consequence		Likelihood	Risk Rating	Best Management Option	Consequence when managed		Likelihood	Managed Risk Rating	Action Plan
Sabotage	Effluent quality compromised	**3**	**1**	Moderate	Ensure acceptable security fencing, locks and lighting at treatment plant	reduced opportunity	**3**	**1**	Moderate	**C**
Power supply failure	Untreated wastewater discharge to maturation pond	**2**	**4**	Low	Acceptable for short duration	Report to EW	**2**	**4**	Low	**D**
Disruption to activated sludge process	Reduced standard of treatment	**2**	**3**	Low	Prepare contingency plan	Reduced standard of treatment	**2**	**3**	Low	**D**
Structural failure of pond embankment	Major discharge of wastewater to the stream	**4**	**4**	High	Investigate and analyse stability of the embankment	Continued operation of the plant	**2**	**1**	Low	**B**
EQ damages WWTP	Pipe work and structural failure	**4**	**3**	High	Check susceptibility to EQ	Untreated wastewater discharge to maturation pond	**3**	**3**	Moderate	**B**
Inability to treat at peak inflow at Te Kuiti due to high inflow to sewers	Reduced standard of treatment	**4**	**5**	High	Install onsite storage at meat processing plants	No reduced level of treatment	**2**	**3**	Low	**B**
Greater level of treatment required at Benneydale to meet possible new resource consent conditions	Increased cost of treatment	**3**	**7**	High	Investigate low cost effluent disposal options	Affordable costs	**3**	**4**	Moderate	**B**
Te Kuiti WWTP effluent not in accordance with Resource Consent	EW action and penalties	**3**	**4**	Moderate	Install automated monitoring and SCADA equipment	Continued operation of the plant	**3**	**2**	Moderate	**B**
Increasing Te Kuiti resource consent Standards in 2011 consent renewal	Unable to meet discharge conditions	**3**	**6**	Moderate	Continuous improvement of WWTP processes including UV and sludge dewatering	Ability to meet increased requirements	**2**	**2**	Low	**B**
Enforced restriction on meat companies discharge due to WRC abatement notice	Compensation to companies and /or reduction in company investment	**4**	**5**	High	Discussion with meat companies and EW regarding mitigation factors and crucial issues	An awareness of the issues and specific management plans	**4**	**5**	High	**B**

Wastewater Risk – Pump Stations

Risk Description	Consequence		Likelihood	Risk Rating	Best Management Option	Consequence when managed		Likelihood	Managed Risk Rating	Action Plan
Mechanical failure in Main pump station	Major overflow to river	**4**	**4**	High	Review maintenance inspection of pumps and spares holdings. Investigate pump running hours	Reduced likelihood of failure	**3**	**1**	Moderate	**B**
Power failure	Major overflow to river	**4**	**5**	High	Provide connection for mobile generator at pump station and install suitable overflow storage volume capacity	Much reduced risk of discharge	**3**	**1**	Moderate	**B**
MCC failure	Major overflow to river	**4**	**4**	High	Review maintenance inspection of controls and spares holdings	Much reduced risk of discharge	**3**	**1**	Moderate	**B**
Mechanical failure in local pump station	Dependent on location of station	**2**	**4**	Low	Review maintenance inspection of pumps and spares holdings and install remote SCADA monitoring and alarm	Much reduced risk of discharge	**1**	**1**	Low	**D**
Power failure in local pump station	Dependent on location of station	**2**	**5**	Moderate	Provide connection for mobile generator at pump stations and install remote SCADA monitoring and alarm	Much reduced risk of discharge	**1**	**1**	Low	**C**
MCC failure in local pump station	Dependent on location of station	**1**	**4**	Low	Review maintenance inspection of controls and spares holding sand install remote SCADA monitoring and alarm	Much reduced risk of discharge	**1**	**1**	Low	**D**
Enforced restriction on meat companies discharge due to WRC abatement notice	Compensation to companies and /or reduction in company investment	**4**	**5**	High	Discussion with meat companies and WRC regarding mitigation factors and crucial issues	An awareness of the issues and specific management plans	**4**	**5**	High	**B**

APPENDIX D: EFFECTIVE LIVES AND UNIT COST OF WASTEWATER ASSETS

Reticulation Material	Base Life Yrs	NZ-Guidelines
Unknown	80	60-150
CONC	80	60-150
PVC	120	60-150
Corrugated Plastic	80	60-150
RC	80	60-151
RIBLOC	60	60-150
GEW	100	60-150
AC	80	60-150
Feature Type	Base Life	
Cesspit	70	60-150
Manhole	100	60-151
Open Drain	100	60-152

Pipe Size	ORC(2009)	On-Cost	Unit Cost 2009	CPI 2009-2012	Estimated Unit Cost 2012
<100	165	8%	178	4.30%	186
100	113	8%	122	4.30%	127
150	138	8%	149	4.30%	155
200	154	8%	166	4.30%	173
225	165	8%	178	4.30%	186
230	179	8%	193	4.30%	202
250	186	8%	201	4.30%	210
300	194	8%	210	4.30%	219
350	223	8%	241	4.30%	251
375	242	8%	261	4.30%	273
400	265	8%	286	4.30%	299
450	282	8%	305	4.30%	318
500	307	8%	332	4.30%	346
550	332	8%	359	4.30%	374
600	376	8%	406	4.30%	424
610	378	8%	408	4.30%	426
650	421	8%	455	4.30%	474
670	421	8%	455	4.30%	474
675	421	8%	455	4.30%	474
700	454	8%	490	4.30%	511
750	514	8%	555	4.30%	579
760	518	8%	559	4.30%	583
800	575	8%	621	4.30%	648
900	659	8%	712	4.30%	742
1000	774	8%	836	4.30%	872
1200	936	8%	1011	4.30%	1054
1350	1051	8%	1135	4.30%	1184
1500	1207	8%	1304	4.30%	1360
1600	1347	8%	1455	4.30%	1517
1800	1501	8%	1621	4.30%	1691
1830	1501	8%	1621	4.30%	1691
1	165	8%	178	4.30%	186

APPENDIX E: EXTRACT FROM WAIKATO REGIONAL PLAN – DISCHARGE OF BIOSOLIDS AND SLUDGES OR LIQUIDS FROM ACTIVATED SLUDGE TREATMENT PROCESSES TO LAND

(Operative date: 28 September 2007)

3 Water Module

3.5 Discharges*

3.5.6 Implementation Methods - Discharge of Biosolids* and Sludges or Liquids from Activated Sludge Treatment Processes to Land

3.5.6.1 Good Practice

Environment Waikato will, in conjunction with organisations, industry groups and individuals, provide guidance on good practice techniques for the reuse of biosolids and nonhazardous byproducts from industrial and trade premises as soil conditioners or fertilizer substitutes.

3.5.6.2 Permitted Activity Rule - Discharge of Sludges and Liquids from Activated Sludge Treatment Processes to Land

The discharge of sludges and liquids from activated sludge treatment processes onto or into land and any consequent discharge of contaminants to air is a **permitted activity** subject to the following conditions:

1. There shall be no direct discharge to water.
2. The material shall not enter surface water by overland flow.
3. The material shall not contain any human/animal pathogens or hazardous substances.
4. The total nitrogen loading onto grazed pasture shall not exceed the limits as specified in Table 3-7, including any loading made under Rules 3.5.5.1, 3.5.5.2, 3.5.5.3 and 3.5.6.3.
5. The discharger shall maintain daily records of the volume discharged to each paddock or relevant area and the concentration of nitrogen in the discharge in, as a minimum, monthly samples.
6. The records required under condition e) shall be made available to the Waikato Regional Council upon request.
7. The maximum loading rate of effluent onto any part of the irrigated land shall not exceed 25 millimetres depth per application.
8. The material shall either
    1. not be stored for longer than eight hours prior to application, or
    2. have been stabilised by storage and dewatering for a period of at least 6 months.
9. The discharge location should provide for the following buffer zones between the discharge area and neighbouring land uses or sensitive environments:
    1. 300 metres from any school, residential zone or rural residential zone as identified by the relevant district plan
    2. 150 metres from any residence or building of regular occupation such as community halls, Marae and public or community facilities
    3. 50 metres from any property boundary
    4. 10 metres from any surface water body
    5. 20 metres from a Significant Geothermal Feature*.
10. Any discharge to air arising from this activity shall comply with the permitted activity conditions in Section 6.1.8 of this Plan.
11. Where fertiliser is applied onto the same land on which activated biosolids have been disposed of in the preceding 12 months, the application must be in accordance with Rule 3.9.4.11.
12. The soil pH where the biosolids are discharged is not less than pH 5.5.

Advisory Notes:

- Discharges of contaminants into or onto land within 20 metres of a Significant Geothermal Feature are addressed by Rule 7.6.6.1 of this Plan. Significant Geothermal Features are defined in the Glossary, and in Development and Limited Development Geothermal Systems, identified on maps in Section 7.10 of this Plan.

3.5.6.3 Controlled Activity Rule - Discharge of Biosolids and Sludges and Liquids from Activated Sludge Treatment Processes

The discharge of biosolids or sludges and liquids from activated sludge treatment processes onto or into land, and any subsequent discharge to air, that is not permitted by Rule 3.5.6.2 is a **controlled activity** (requiring resource consent) subject to the following standards and terms:

- Concentrations of pathogens or hazardous substances in the material shall not exceed the values given in Table 3-9.
- The discharge shall not:
  - result in ponding where the contaminant remains on an area of more than 10 square metres 24 hours after being irrigated.
  - cause a direct discharge to surface water or ground water.

- The discharge shall not occur within 20 metres of a Significant Geothermal Feature*.
- Any discharge to air arising from this activity shall comply with the permitted activity conditions in Section 6.1.8 of this Plan.
- The soil pH where the biosolids are discharged is not less than pH5.5.

Waikato Regional Council reserves control over the following matters:

(a) The season during which the discharge can occur.
(b) The frequency at which the discharge can occur at the same location.
(c) The maximum annual nitrogen loading rate for the discharge site given the proposed land use.
(d) Measures to manage the effects of contaminants such as heavy metals, mineral salts or hazardous substances on the long-term health of the soil resource and on the existing and range of foreseeable uses of the soil resource.
(e) The means of controlling objectionable odour.
(f) Measures to avoid significant adverse effects of the activity on tangata whenua values of the site.
(g) Measures for managing effects of the discharge upon the soil's hydraulic loading capacity and compaction.
(h) Measures to ensure that adverse effects on nearby land uses, water bodies or areas of significant indigenous vegetation, significant habitats of indigenous fauna and significant natural features such as cave and karst systems are avoided, remedied or mitigated.
(i) The maximum level of soil contamination that is acceptable at the application site.
(j) The method of application.
(k) Separation distances from sensitive areas.
(l) Record keeping and nutrient budgeting.

Advisory Notes:

(b) Discharges of contaminants into or onto land within 20 metres of a Significant Geothermal Feature are addressed by Rules 7.6.6.1 of this Plan. Significant Geothermal Features are defined in the Glossary, and in Development and Limited Development Geothermal Systems, identified on maps in Section 7.10 of this Plan.
(c) Biosolids that carry the registered Biosolids Quality Mark (BQM) accreditation are likely to comply with this Rule.

3.5.6.4 Discretionary Activity Rule - Other Discharges of Biosolids and Sludges and Liquids from Activated Sludge Treatment Processes[1]

The discharge of biosolids into water or onto or into land that does not comply with Rules 3.5.6.2 and 3.5.6.3 is a **discretionary activity** (requiring resource consent).

Exclusion to Rule 3.5.6.4:
Discharges of contaminants within 20 metres of Significant Geothermal Features are excluded from this Rule. The effects of these activities are managed by Rule 7.6.6.1 of this Plan.

Advisory Note:

(c) Information requirements to enable the assessment of any application under this Rule are set out in Section 8.1.2.2 of this Plan. In addition, assessment shall also take into account the matters identified in the policies of Section 3.5.3 of this Plan.

(d) Significant Geothermal Features are defined in the Glossary, and in Development and Limited Development Geothermal Systems, identified on maps in Section 7.10 of this Plan.

Table 3-9 Pathogen and Contaminant levels

E.coli	<100 MPN/g
Campylobacter	<1/25g
Salmonella	<1/25g
Enteric Viruses	<1 PFU/4g
Helminth ova	<1/4g
Arsenic	20 mg/kg dry weight
Cadmium	1 mg/kg dry weight
Chromium	600 mg/kg dry weight
Copper	100 mg/kg dry weight
Lead	300 mg/kg dry weight
Mercury	1 mg/kg dry weight
Nickel	60 mg/kg dry weight
Zinc	300 mg/kg dry weight
DDT/DDD/DDE	0.5 mg/kg dry weight
Aldrin	0.02 mg/kg dry weight
Dieldrin	0.02 mg/kg dry weight
Chlordane	0.02 mg/kg dry weight
Heptachlor and Heptachlor epoxide	0.02 mg/kg dry weight
Hexachlorobenzene (HCB)	0.02 mg/kg dry weight
Hexachlorocyclohexane (Lindane)	0.02 mg/kg dry weight
Benzene Hexachloride (BHC)	0.02 mg/kg dry weight
Total polychlorinated biphenyls	0.02 mg/kg dry weight
Total dioxin TEQ	0.00003 mg/kg dry weight

Explanation and Principal Reasons for Adopting Methods 3.5.6.1 to 3.5.6.4

Method 3.5.6.1 identifies that guidelines defining good practice techniques are a valuable tool in managing the effects of these discharges. Environment Waikato will provide guidance on the development of these guidelines. In particular, good practice guides need to focus on means of applying these wastes to land so that neither soils nor ground water are contaminated as a consequence of over-application or application during the wrong season.

The rule framework in **Rules 3.5.6.2 to 3.5.6.4** recognises that biosolids and other nonhazardous byproducts from industrial or trade premises can be suitable for use as soil conditioners and fertiliser substitutes in accordance with Policies 1, 2 and 4. However, because of their source, these substances may contain hazardous contaminants to levels that will contaminate soil or water. Due to their source and typical composition, these substances may also generate objectionable levels of odour. Because of these risks, some control must be exercised to ensure that the substance will not contaminate soils, generate odours or result in contamination of surface and ground water.

Only discharges of biosolids, sludges and liquids from activated sludge treatment processes are permitted by these Rules. The treatment process that they have been subject to means that the objectionable odours associated with anaerobic processes are largely removed. For example, material can be processed through a clarifier and aerated, resulting in an activated sludge. Provided they are applied in the same way as other fertilisers such as farm animal effluent, the risk of adverse effects is minimal.

Rule 3.5.6.4 provides for the beneficial reuse of biosolids sourced from municipal wastewater treatment plants and industrial sources provided that contaminants within the biosolid are sufficiently low that there is little risk of creating a new contaminated site through continual application of the material. The

contaminant levels in Table 3-8 are derived from the Guidelines for the Safe Application of Biosolids in New Zealand (NZWWA, 2003). To ensure that the objectives and policies in Chapter 5.2 of the Plan are achieved, the levels are set at the contaminant levels deemed by that guideline to be acceptable from 2012 rather than the less conservative values recommended from 2003 - 2012. With this exception, biosolids or other effluents that have obtained registered Biosolids Quality Mark accreditation or equivalent are enabled by this Rule.

Footnotes

Parts of this rule are subject to PWRP: Proposed Variation No. 7 - as notified on 27 June 2007

APPENDIX F: EXTRACT FROM WAIKATO REGIONAL PLAN RULE 6.1 – AIR DISCHARGES FROM SOLID OR LIQUID WASTE MANAGEMENT PROCESSES

(Operative date: 28 September 2007)

6 Air Module

6.1 Regional and Local Air Management

6.1.18 Implementation Methods - Waste Management Process

6.1.18.1 Permitted Activity Rule - Waste Management Process

The discharge of contaminants into the air arising from the storage, transfer (excluding refuse transfer stations), treatment or disposal of liquid and solid waste is a **permitted activity** subject to the following conditions:

- The activity was lawfully established, except by way of a resource consent, before the date of notification of this Plan.
- Any change in the activity shall not increase the scale, frequency, intensity, nature or duration of any discharge to air compared to when the activity was established or authorised.
- The activity is not already restricted in Sections 3.5.5, 3.5.6, 3.5.7, 5.2.5, 5.2.6, 5.2.7, 5.2.8 or 6.1.12 of this Plan.
- The process does not involve the treatment of hazardous substances.
- As specified in Section 6.1.8 conditions a) to e) of this Plan.

Advisory Notes:

- Consideration of district plan objectives, policies and rules with regard to waste management should also be made.
- Adverse effects from these activities should not occur if they are managed in accordance with good practice.
- Rule 6.1.19.1 part 27 addresses refuse transfer stations.
- If any of these conditions are not complied with then the activity is a discretionary activity in accordance with Rule 6.1.9.2.

Explanation and Principal Reasons for Adopting Method 6.1.18.1
Rule 6.1.18.1 is restricted to activities lawfully established before the date of notification of this Plan and applies to waste management undertaken on both industrial or trade premises and non-industrial or trade premises. Examples of activities permitted by this Rule include municipal sewage treatment plants, trade waste, waste transfer stations, oxidation ponds, and waste from intensive indoor farms. The Rule permits the discharges only to the extent that they remain at the same or lesser scale and of a similar nature to that authorised at the date of notification of this Plan.

This Rule does not apply if the discharge to air is already addressed in other rules in this Plan.

This Rule also does **not** apply if the activity has already been authorised by a resource consent at the date of notification of this Plan.

APPENDIX G: EXTRACT FROM WAIKATO REGIONAL PLAN – DISCHARGES TO WATER

(Operative date: 28 September 2007)

3 Water Module

3.5 Discharges*

3.5.4 Implementation Methods - Discharges

3.5.4.1 Environmental Education*

Environment Waikato will, through environmental education programmes:

- Raise awareness of the use of land treatment as an environmentally sound method of treating some waste streams where soils allow, and recycling the nutrients and water they contain, as an alternative to disposal to water.
- Encourage waste reduction and reuse programmes in industry and the community to minimise waste discharge volumes.
- Raise awareness of the adverse effects of:
  - urban stormwater discharges on water quality
  - household water introduced into stormwater systems.

3.5.4.2 Promotion

Environment Waikato will encourage and promote industry research into effluent management practices, specifically:

- Land-based irrigation systems.
- Methods for improving effluent quality.
- New technologies for managing agricultural effluents.

3.5.4.3 Part XII RMA Enforcement

Environment Waikato will apply for enforcement orders, issue abatement notices and use other enforcement mechanisms in Part XII of the RMA, where, as a result of inappropriate discharge practices, significant adverse effects on water bodies occur, including:

- Significant adverse effects on water quality.
- Significant downstream flooding or erosion.
- Significant downstream siltation.

Advisory Note:

- Refer also to enforcement methods regarding adverse effects on soil and air quality in Section 5.2.6.1 of this Plan.

3.5.4.4 Permitted Activity Rule - Discharges of Water to Water - General Rule

Except as expressly provided for by other rules in this Plan any discharge of water (excluding geothermal water), into water is a **permitted activity** subject to the following conditions:

- There shall be no adverse effect on water quality of the receiving water body.
- Any adverse erosion effects occurring as a result of the discharge to be remedied as soon as practicable.
- There shall be no adverse effects from increased water levels downstream of the discharge point.

- The Waikato Regional Council shall be notified in writing of the discharge, its volume, contaminant concentrations and the water quality of the receiving water body 10 working days prior to the discharge commencing.

Exclusion to Rule 3.5.4.4

Discharges of geothermal water are excluded from this rule. The effects of these activities are managed by the rules in Chapter 7 of this Plan.

3.5.4.5 Discretionary Activity Rule - Discharges - General Rule

Any discharge of a contaminant into water, or onto or into land, in circumstances which may result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering water, that is not specifically provided for by any rule, or does not meet the conditions of a permitted or a controlled activity rule in this Plan, is a **discretionary activity** (requiring resource consent).

Advisory Note:

- Information requirements to enable the assessment of any application under this Rule are set out in Section 8.1.2.2 of this Plan. In addition, assessment shall also take into account the matters identified in the policies in Section 3.5.3 of this Plan.

3.5.4.6 Non-Complying Activity Rule - Discharges into other Water Bodies

The discharge of contaminants (not including stormwater or contaminants associated with the take and use of geothermal water), into Natural State Water Bodies or wetlands[1] that are areas of significant indigenous vegetation and/or significant habitats of indigenous fauna or cave entrances or lakes (excluding artificial lakes and Lake Rotoaira) is a **non-complying activity** (requiring resource consent).

Exclusion to Rule 3.5.4.6:

Discharges of contaminants associated with the take and use of geothermal water are excluded from this rule. The effects of these activities are managed by the rules in Chapter 7 of this Plan.

Advisory Notes:

- Information requirements to enable the assessment of any application under this Rule are set out in Section 8.1.2.2 of this Plan. In addition, assessment shall also take into account the matters identified in the policies of Section 3.5.3 of this Plan.

Explanation and Principal Reasons for Adopting Methods 3.5.4.1 to 3.5.4.6
The methods in this section apply across the whole chapter. The non-regulatory methods have been focused on supporting activities permitted as a consequence of Policy 1 and ensuring that while these activities have been enabled, their potential adverse effects are still adequately managed. For instance, **Method 3.5.4.1** uses environmental education to promote the reuse and recycling of liquid effluents and wastes. Irrigation of effluent onto land, where appropriate, achieves this as well as meeting cultural and spiritual objections concerning effluent disposal to water. Likewise, **Method 3.5.4.2** recognises that improved treatment technology is an important area that needs further research. This recognises concern that pond and barrier ditch systems may not be sustainable in certain parts of the Waikato Region owing to the intensity of agriculture and associated discharges. **Method 3.5.4.3** acknowledges that enforcement will continue to be an option for Environment Waikato when significant adverse effects occur as a result of discharges.

Rule 3.5.4.4 and **Rule 3.5.4.5** are general rules that apply to all discharges not otherwise enabled by this Plan. They provide certainty and clarity for resource users. Rule 3.5.4.4 implements Policy 1 by enabling discharges of water into water where the discharge will have no adverse effects. These discharges currently require resource consent under the presumptions of the RMA. The intent of this rule is that such discharges will be permitted where there is no increase in any parameters (e.g. temperature and contaminant load) of water quality in the receiving environment. The Rule does not enable discharges that will adversely change the composition of water and, therefore, have an adverse effect on

water quality. The kinds of discharges to be enabled by this Rule would include discharges of diverted ground water from dewatering operations. The condition requiring that Environment Waikato be notified is essential to give the community a chance to ensure that the discharge can really comply with the Rule.

Rule 3.5.4.6 recognises the high values of our natural state areas and the scarcity and fragile nature of our lake, wetland, and cave systems, and regulates discharges of contaminants to them. Discharges in these environments could have significant irreversible adverse effects. The non-complying status of this Rule sends the signal that these activities should be discouraged but also allows opportunity for consent to be granted in cases where the effects of the activity can be shown to be minor and where granting consent is not contrary to the objectives and policies of the Plan.

Footnotes

Refer to Appendix 3 of the RPS.