STORMWATER

ASSET MANAGEMENT PLAN

2018

DOCUMENT CONTROL SHEET

Document Author:	Andreas Senger – Manager Water Services
Reviewed by:	Greg. Boyle, Special Projects Coordinator.
Approved for issue by:	Kobus du Toit, General Manager – Infrastructure Services

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SECTION 1 - EXECUTIVE SUMMARY

1.1 INTRODUCTION

This Activity Management Plan (AMP) represent Waitomo District Council's (WDC's) 2018-48 Storm water Activity Plan and associated long-term expenditure forecast produced for urban stormwater assets owned and managed by WDC. It covers the storm water assets owned and operated by Council in urban areas, including Te Kuiti, Benneydale, Piopio, Mokau – Awakino and Te Waitere. The storm water asset components are defined as urban open drains, storm water pipes, manholes and wing walls, downstream from surface channels, as well as sumps and sump leads on the road network. Culverts and side drains together with associated rural drainage assets are included in the Roading AMP.

The 30 year planning period covered by this AMP corresponds to the legislative requirement to prepare an infrastructure strategy for at least a period of 30 consecutive years, as an integral part of Council's Long Term Plan.

The storm water activity budgets contained in WDC's 2018-28 LTP and 2018-48 Infrastructure Strategy (IS) have been informed by this AMP. It is intended that Council will adopt this AMP as a draft in early 2018 in support of the draft LTP and IS. It will be adjusted following any relevant changes made to the LTP arising from public consultation and after adoption of the final LTP by the end June 2018.

It is planned to review and update this AMP regularly, in line with the 3 yearly planning cycle of Council's Long Term Plan (LTP), to incorporate improved decision making techniques, better asset information and a better understanding of customer expectations.

This AMP is intended to demonstrate responsible stewardship of WDC's urban stormwater 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 planning. It provides a focus within WDC for ongoing development of good asset management practices and demonstrates how the service potential of WDC's storm water infrastructure will be maintained at optimum cost to provide a defined level of service over the long term.

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

There is no plan to expand the elementary storm water drainage schemes at other townships within Waitomo District, particularly as the low rate of urban development will place only minimal additional demand on the capacity of existing storm water infrastructure.

1.2 SCOPE OF ACTIVITY

This AMP covers the urban stormwater assets owned by WDC, which include the reticulation network, pumping stations, treatment plants and disposal systems

This activity covers all drainage services in the following urban areas:

- Te Kuiti
- Benneydale
- Piopio
- Mokau – Awakino
- Marokopa
- Te Waitere

There is limited information available regarding the scope of assets making up the storm water network. Of that, the most up to date information available is for Te Kuiti, which also has the largest proportion of the overall storm water network in the district. Verifying and improving the

inventory data for Te Kuiti is a priority for effective management of the activity and in particular the development of a catchment plan. Capturing inventory data for the remaining urban storm water assets will not add significantly to the overall asset database.

The total scope of the known stormwater asset components managed by WDC is:

Asset Type	Quantity
Manholes	389
Pump stations	Nil
Cesspits	652
Storm water reticulation	31,412 km

Figure 1.1: Asset Numbers

The Te Kuiti and Mokau urban drainage assets are dominated by reinforced concrete pipes and open drains, as demonstrated below.

The bulk of these assets are estimated to reach the end of their effective lives outside the life of the LTP planning period (2018 - 2028), with a bulge occurring in the 40 – 60 year bracket. Given the high value of the assets involved, this replacement profile would not be sustainable without a smoothing strategy - this is dealt with under the lifecycle asset management section.

The assets comprising the above four schemes currently owned and managed by WDC have an optimised replacement value (ORC) of $15.97 million as at 30 June 2015, as summarised in the following table:

Optimised replacement Cost (ORC)	Optimised Depreciated Replacement Cost (ODRC)	Annual Depreciation
$15,973,747	$9,226,716	$177,492

Figure 1.2: Asset Replacement Costs

The stormwater assets at Waitomo Village consist mainly of those associated with road drainage. The few that exist outside of this are privately owned and operated, and do not form part of this AMP. It is noted however that the option of this scheme, together with or independent of the other Village infrastructure, being handed over to the Council has been raised by the current owners, and has been the subject of ongoing discussion between the parties.

1.3 STRATEGIC ENVIRONMENT

1.3.1 Vision

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

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

Council's Storm water Activity provides for the collection, diversion and disposal of urban surface water runoff following rainfall (Note: SW sumps, sump leads and rural drainage assets are included under the Roads and Footpaths Activity)

1.3.2 Community Outcomes

The Storm water Activity contributes to the following community outcomes:

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

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

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

1.3.3 Strategic Goals for the Group

- To protect public health and property
- To protect the environment from the adverse effects of storm water
- To enable economic development

1.3.4 Rationale for Activity

The SW activity exists to ensure that the natural environment and district community is protected from detrimental effects of storm water.

1.4 SUMMARY OF ISSUES

1.4.1 General

Current issues include limited asset data on network condition and performance. Significant sections of the Te Kuiti network are partially blocked or damaged, with the rate of repair work dependent on internal resources and budget.

The SW reticulation is ageing and parts of it are in poor condition. WDC has a structured renewals programme in place based on existing information and expected asset lives, however only those sections of the network that are actually failing are replaced and often those sections are not a priority in the renewal programme.

The SW renewal profile indicates that the majority of renewals become due during the 2045-49 and 2060–64 periods. Smoothing of the replacement profile has been necessary to ensure that the renewals programme fits within WDC's affordability envelope and is prioritised consistent with detailed condition and performance assessments of the network.

The effectiveness of the Te Kuiti SW drainage system is dependent on flow levels in the Mangaokewa Stream. During flood conditions (e.g. the 1958 flood), stream levels will back-flow via SW pipe outlets and surcharge within the urban area. Work completed by Waikato Regional Council on modelling flood levels for a one in 100-year event does not identify clear flood paths or affected land. Detailed survey and catchment modelling of each urban catchment area within Te Kuiti will therefore be required to enable identification and mapping of secondary flowpaths.

A prioritised program of works to address any identified capacity/protection shortfall, including protection of secondary flow paths and environmental protection works to mitigate adverse effects at the points of discharge, would be derived from this work and will require funding to implement. For example, better drainage along Cotter Street, rerouting storm water from under houses causing collapse, construction of manholes and extension of pipes in Hospital Road to prevent road scouring.

1.4.2 Resource consents

WDC holds a comprehensive SW Discharge Consent to capture the numerous SW point discharges. The consent expires on 1 July 2024 – half way though the 2018-28 LTP planning period. Application documentation will need to be submitted to Waikato Regional Council no later than 1 January 2024 to ensure continuation of SW discharges while the consent is processed.

Public pressure for higher standards of water quality in receiving waters may require stormwater treatment devices with associated capital and operational cost. An assessment is already underway to determine the scope of this work with small debris retention structures being incorporated into upgrade work.

Stormwater treatment required by stormwater discharge consents will increase stormwater disposal costs. Similarly, the environmental assessment of effects and monitoring requirements imposed by more stringent discharge consents will carry significant increases in cost. Preliminary provision for that has been made for that in 2029-32, just outside the 2018-28 LTP planning period.

Catchment Management Plans (CMP's) will need to be developed over the next five years to clearly identify and define existing water courses and secondary overland flow paths. The CMP's will also needed to identify water courses regarded as significant and warranting protection from an environmental point of view. Significant asset data identification and verification will be needed. The backlog is large and progress is slow at this point.

Demand for piping of public open drains through private properties can be expected to grow, noting that some private open drains have previously been piped with joint private/public funding depending on the split between estimated private and public benefits of the work.

Unidentified deferred maintenance and improvement work will need to be done as it becomes apparent.

Any increased demands on the capacity of existing stormwater services will require substantial upgrading costs.

Future maintenance and renewals costs associated with the networks can be expected to increase within the planning period.

Relatively minor changes to LoS could have major impacts on costs.

Increased demand for improved public stormwater systems at beach communities and low lying areas due to the impacts of climate change, is likely to occur in the medium term.

Public safety considerations (e.g. security of pipe outfalls and stormwater manhole entry) are very prominent and the necessity to ensure public safety safe of the existing system will add cost to operations and maintenance.

1.5 LEVELS OF SERVICE

This AM plan is focused on clarifying and defining key customer and technical levels of service for the urban storm water network and then identifying and costing future operations, maintenance, renewal and capital works required to provide these levels of service. The present system is based on servicing a 1 in 2 year rainfall event.

The levels of service set out in Section 5 are based on customer expectations, the strategic goals set out above, and statutory requirements.

1.5.1 Performance Measures

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

Link to community outcomes	**What we do (level of service)**	**How we measure success (performance measure)**	**2016/17 Target/ Result**	**2017/18 Target**	Year 1 **Target 2018/19**	Year 2 **Target 2019/20**	Year 3 **Target 2020/21**	Year 4-10 **Target 2021-28**
Vibrant Communities CO5 Sustainable Infrastructure CO10	Stormwater drainage system is adequate and is sufficiently maintained.	The number of flooding events* that occur in the district in a financial year.	Nil (for less than 1 in 2 year event) / Achieved (0)	Nil (for less than 1 in 2 year event)	0	0	0	0
		For each flooding event* the number of habitable floors affected in a financial year.	≤ 1 per 1000 properties / Achieved (0)	≤ 1 per 1000 properties	≤ 1 per 1000 properties	≤ 1 per 1000 properties	≤ 1 per 1000 properties	≤ 1 per 1000 properties
Vibrant Communities CO5 Effective Leadership CO8 Sustainable Infrastructure CO10	Compliance with resource consent conditions for discharge from the Councils urban stormwater system that relate to environmental effects	Compliance with resource consents for discharge from its Stormwater system, measured by the number of the following *(received by Council within a financial year)*:						
		• abatement notices	0 / Achieved (0)	0	0	0	0	0
		• infringement notices	≤2 / Achieved (0)	≤2	≤2	≤2	≤2	≤2
		• enforcement orders	Nil Achieved (Nil)	Nil	0	0	0	0
		• successful prosecutions	Nil / Achieved (Nil)	Nil	0	0	0	0
Vibrant Communities CO5 Sustainable Infrastructure	The Council responds to failures and request for service in a prompt and efficient way	The median response time to attend a flooding event*, (measured from the time that the	≤ 180 minutes (3hrs) / Achieved (0)	≤ 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		notification is received to the time that service personnel reach the site)						
Vibrant Communities CO5 Sustainable Infrastructure CO10	The Council provides a reliable stormwater collection service	The number of complaints received about the performance of the Council's urban stormwater system per 1,000 properties connected.	≤4 complaints per 1000 properties / Achieved (2.9)	≤4 complaints per 1000 properties	≤4 complaints per 1000 properties	≤4 complaints per 1000 properties	≤4 complaints per 1000 properties	≤4 complaints per 1000 properties
	** A flooding event means an overflow of stormwater from a territorial authority's stormwater system that enters a habitable floor. Habitable floor refers to a floor of a building (including a basement) but does not include ancillary structures such as stand-alone garden sheds or garages.*							

Figure 1.3: Levels of Service

1.6 FUTURE DEMAND

The main drivers of demand for stormwater services are:

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

1.6.1 Population

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

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

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

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

Figure 1.4: 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 SW infrastructure.

Stormwater collection, disposal and control is investigated for any size subdivision, taking due consideration of flow rates and velocities to prevent scouring, and for larger subdivisions (10 or more lots), contamination control structures.

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 can have a significant impact on stormwater collection and disposal capacity, is partly dependent on attracting new industries into the urban centres. The impact of stormwater discharges from industrial properties can be significant and would need to be managed through the development of structure plans and catchment management plans, followed by the provision of adequate infrastructure to service these areas.

1.6.3 Climate change

Within New Zealand, the Ministry for the Environment has provided local government with advice on Climate Change and more recently coastal hazards and risks arising from increases in sea level. The hazards and risks associated with the District coastlines, estuaries and harbours is expected to compound as will the related exposure of people and infrastructure to hazards and risks. Ongoing consideration will be required as it relates to the assets contained within the Activity Management Plans and the impacts of Climate Change on these assets.

As a District how we prepare, assess, plan, manage and monitor the hazards and risks that arise from climate change will influence the intergenerational resiliency of the Waitomo District.

Currently the council has made provisions within AMP's (Water Supply, Waste Water, Storm Water, Road and Footpaths) and more broadly in particular the consequences of new capital work

occurring in areas with the potential to be impacted by climate change. This however will be an ongoing cycle in order to manage the risk associated with Climate Change.

1.6.4 Risks And Resilience Improvement Plan

Aspects that require further development include:

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

1.6.5 Community expectations

The following issues/trends are expected to impact on the capacity and quality of WDC's stormwater services provided:

- Continued public pressure for higher standards of water quality in receiving waters.
- Increasingly stringent resource consent conditions for storm water discharges.
- High inflow rates per head of population resulting in overloaded sewer pipes.
- Impacts of climate change on rainfall patterns, runoff coefficients and rising sea levels leading to increasing demand for installation of public storm water systems

In the meantime, no provision has been made over the term of this AMP for additional SW infrastructure to support growth planning.

1.7 LIFECYCLE ASSET MANAGEMENT

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

This AMP is based on existing levels of service, currently available information and the knowledge and experience of Council staff and contractors competent in asset management practices.

The Storm water activity budgets contained in the draft 2018-28 LTP have been informed by this AMP. The latter will be adjusted following any relevant changes made to the LTP arising from public consultation and after adoption of the final LTP.

The key issues relating to the 30-year forward projections are summarised below

1.7.1 Asset Data

Council's stormwater assets have been assessed using local knowledge but these assessments require verification; most of the assets are over half their expected useful life and are showing signs of deterioration. In particular, the following issues are noted:

- Asset data: There is a dearth of information regarding the age, condition and performance of the urban stormwater reticulation. Current information has been drawn from limited existing records, overlaid with a desktop exercise involving input from contractors and staff to capture and record local knowledge.

- Similarly, catchment discharge and system capacity is not known. A priority in the Improvement Plan is a project to capture this data and to prepare catchment plans for each urban area to ascertain and compare design runoff with system capacity. A gap analysis of the findings will provide the basis for future capacity improvements.
- Related to this will be an environmental assessment of each stormwater drain and receiving water to determine and assess any ecological sensitivity and environmental amenity.

1.7.2 Maintenance

Maintenance is the on-going day to day work activity required to keep assets serviceable and prevent premature deterioration or failure. Two categories of maintenance are carried out:

> Unplanned Maintenance: The majority of defects are notified by the public, and a 24 hour call-out service is provided to attend problems. Contract documents specify the timeliness of the response and the actions to be taken. Priority is given to works impacting on safety over cosmetic type work.
>
> Planned Routine Maintenance: Work carried out to a predetermined schedule or planned in association with other work.

Direct operation and maintenance costs average approximately $134,000 per year over the next 10 years. The funding provided for renewals over the preceding 3 years had been taken up addressing issues maintenance that become apparent during the time

1.7.3 Renewals

The renewals program comprises an essential part of this AMP. Maintaining levels of service is dependent on replacing assets at the end of their useful lives. The actual timing of proposed renewals is determined from a combination of a desk top assessment of age, condition and capacity, followed by physical inspection and condition assessment using phased programme of closed circuit TV (CCTV). The CCTV footage to date has highlighted a raft of problems with some of the older steel "ARMCO" type pipes that were completely corroded around the base. Some of the pipes have been replaced, with further sections identified for replacement.

The forecast renewals costs have been "smoothed" over an 80 year period to flatten the forecast peaks and avoid large variations in renewals expenditure over successive 10 year periods, and to achieve a long term sustainable replacement programme. An average planned renewals expenditure programme of $110,000 pa over the next 10 years has been provided. In addition, an annual minor renewals sum of $54,000 pa has been set aside for unforeseen SW replacement needs.

Within each 10 year period, and as asset information improves, specific renewals will be individually assessed to verify that the renewal is actually needed before renewal funding is committed.

The asset management philosophy is that any identified shortfall in capacity will be addressed at the time of pipe replacement so that any existing undersized pipes will be replaced with larger diameter pipes. Information from the Catchment Assessment Plans will be used to guide this process in an economic and sustainable manner.

1.7.4 New capital works

The capital works programme represents a modest forecast of minor improvement works over the next ten years. It includes the following works:

- The continuation of collecting stormwater asset data for Te Kuiti (catchment plans) and in the rural townships
- A variety of minor improvement works in Te Kuiti as they become apparent

As noted above, completion of urban catchment assessments may identify capacity shortfalls in the existing stormwater network. Similarly, future structure planning proposals for Mokau-Awakino, Te Waitere and Waitomo Village may result in new drainage works proposed for those areas. The capital development programme will be reviewed after the assessment work has been completed.

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 EXPENDITURE FORECAST SUMMARY

The proposed 30 year financial forecast for the stormwater activity was determined from current maintenance and renewal strategies within each of the asset components (i.e. open drains, reticulation networks, outlet structures, etc.).

The following basic assumptions have been made in preparing the expenditure forecast for the first 10 years of this AMP, corresponding to the 2018-28 LTP.

- Capital costs past Year 3 are more subject to change as programmes become refined and detailed.
- Growth in the scale of the existing urban stormwater infrastructure will be minor over the term of the plan.
- There is no provision in this AMP for additional assets vested in Council from subdivisional development - it will be re-assessed during the next 3 year planning cycle.
- Movement in contract rates as the result of re-tendering stormwater maintenance and capital works will be within the construction price index used in the financial projections.
- Maintenance cost forecasts are based on maintaining current levels of service.
- There will be a gradual increase in operating and maintenance expenditure in real terms over the planned period due to the continued ageing of the asset. Significant cost increases may result from more detailed evaluation of asset renewal requirements and more stringent consent and legislative requirements.
- Accelerating the proposed renewal programme would offset operation and maintenance cost increases in part because of improved asset condition. As this reduction is difficult to quantify, it has not been allowed for in the financial forecasts.
- Changes in the district population will not impact on the expenditure forecasts for the stormwater network.
- The most significant changes may result from new legislation or Waikato Regional Council's review of its Regional Policy Statement as it affects the need for higher environmental protection standards associated with the activity.

Tables that cover the projected financial expenditure are as follows:

Figure 1.5: Key Programmes to Maintain and Achieve Levels of Service

Trend	Project	Key Service Criteria	Forecasted Total Cost	Confidence Level in Projections	Estimated Timeline for Project Completion
	Stormwater Rehabilitation		$110,000 18/19 $112,750 19/20 $115,280 20/21 $118,030 21/22 $120,890 22/23 $123,970 23/24 $127,050 24/25 $130,460 25/26 $134,090 26/27 $137,830 27/28	C	2018-2028

Key Strategies Impacting on Future Levels of Service

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

Figure 1.6: 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
N/A	N/A	N/A	N/A	N/A	N/A

Future Demand

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

a) An aging population

b) The need to develop assets relevant to community needs

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

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

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

Figure 1.6: Capital Programmes to Meet Growth and Demand

Trend	Project	Key Service Criteria	Forecasted Total Cost	Confidence Level In Projections	Estimated Timeline for Project Completion
N/A	N/A	N/A	N/A	N/A	N/A

Renewals

Inspections and asset gathering/condition grading has identified the following renewals works for inclusion in the AMP:

Figure 1.7: Renewal Programmes

Project	Key Service Criteria	Forecasted Total Cost	Confidence Level In Projections	Estimated Timeline for Project Completion
Storm water Minor renewals	Health & Safety Environment Legislation	$54,000 18/19 $55,350 19/20 $56,592 20/21 $57,942 21/22 $59,346 22/23 $60,858 23/24 $62,370 24/25 $64,044 25/26 $65,826 26/27 $67,662 27/28	C	2018-2028
Rural Storm water Renewals	Health & Safety Environment Legislation	$5,000 18/19 $5,125 19/20 $5,240 20/21 $5,365 21/22 $5,495 22/23 $5,635 23/24 $5,775 24/25 $5,930 25/26 $6,095 26/27 $6,256 27/28	C	2018/2028

Figure 1.8: Stormwater operating, renewal and capital expenditure forecast 2018 – 2028 LTP

Stormwater ($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											
Te Kuiti Stormwater	0	0	0	0	0	0	0	0	0	0	0
Rural Stormwater	0	0	0	0	0	0	0	0	0	0	0
	0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Direct Expenditure											
Te Kuiti Stormwater	145,854	133,893	133,117	143,597	139,115	142,673	160,852	150,188	154,282	167,058	162,515
Rural Stormwater	27,560	25,040	25,779	26,493	26,783	27,593	28,690	29,210	30,049	30,842	31,330
	173,414	**158,933**	**158,897**	**170,090**	**165,898**	**170,266**	**189,542**	**179,398**	**184,331**	**197,901**	**193,844**
Indirect Expenditure											
Allocated Costs	56,822	49,827	51,539	52,182	53,384	55,034	57,482	59,423	60,972	61,494	63,043
Depreciation	172,454	180,362	182,851	185,396	187,998	190,660	193,387	197,872	200,736	203,675	206,695
Interest	5,085	3,538	3,059	2,482	1,840	1,220	412	0	0	0	0
	234,361	**233,727**	**237,449**	**240,060**	**243,222**	**246,914**	**251,281**	**257,295**	**261,707**	**265,169**	**269,738**
Net Cost of Service	**407,775**	**392,660**	**396,346**	**410,150**	**409,120**	**417,180**	**440,823**	**436,693**	**446,038**	**463,070**	**463,582**
Capital Expenditure											
Te Kuiti Stormwater	299,149	194,121	198,471	202,876	207,648	212,615	234,855	223,305	229,222	235,527	242,007
Rural Stormwater	5,380	5,000	5,125	5,240	5,365	5,495	5,635	5,775	5,930	6,095	6,265
	304,529	**199,121**	**203,596**	**208,116**	**213,013**	**218,110**	**240,490**	**229,080**	**235,152**	**241,622**	**248,272**
Net Expenditure	**712,304**	**591,782**	**599,942**	**618,266**	**622,133**	**635,290**	**681,313**	**665,773**	**681,190**	**704,692**	**711,854**
Funded By											
Reserves	(303,479)	(186,121)	(187,596)	(199,116)	(197,013)	(202,110)	(238,490)	(217,080)	(223,152)	(236,622)	(236,272)
Internal Loans	0	0	0	0	0	0	0	0	0	0	0
Total Rates	(408,825)	(405,660)	(412,346)	(419,150)	(425,120)	(433,180)	(442,823)	(448,693)	(458,038)	(468,070)	(475,582)
	(712,304)	**(591,782)**	**(599,942)**	**(618,266)**	**(622,133)**	**(635,290)**	**(681,313)**	**(665,773)**	**(681,190)**	**(704,692)**	**(711,854)**

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 with improved asset information
- Optimise timing of projects to improve asset data ahead of financial commitments, and to smooth expenditure to a sustainable long term programme
- Generate consistent budgeting philosophies across all asset groups
- Align expenditure with zero growth predictions.

The above financial projections will be again reviewed in 2018 in light of improved asset data that will be collected and recorded over the next 3 years.

1.10 FUNDING OF ACTIVITY

The current funding options available for the stormwater activity include:

- Rates
- 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

Note: Tourism related expenditure on storm water systems is not eligible for capital funding assistance from central government's Tourism Infrastructure Fund (2017).

A summary of the financial forecast over the first 10-years of the 2018-48 period is provided in appendix C. The projections contained in this generation AMP will be reviewed in 2020 in light of improved SW asset information.

1.11 AMP IMPROVEMENT PROGRAMME

An improvement plan that outlines steps required to improve the quality of both the content and presentation of this document is included in Section 12 of this AMP. This has been compiled in conjunction with the plan update.

Key activities/programs 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, recording and contractor maintenance reporting procedures.
- Improve accuracy and completeness of asset data, initially for Te Kuiti SW assets.
- Develop a greater focus on risk identification and management, obtaining more detailed information on critical assets and prioritise identified risk mitigation works.
- Undertake catchment studies and prepare catchment and SW management plans, initially for the Te Kuiti SW catchment.

SECTION 2 - INTRODUCTION

2.1 WAITOMO DISTRICT

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

2.2 PURPOSE OF AM PLANNING

WDC is responsible for the ownership and management of the district's urban stormwater infrastructure having an optimised replacement value of approximately $15.9M (30 June 2015).

The size of this investment and the importance of stormwater services to the community demands prudent management of these assets. The community expects stormwater 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 (AM) plan combines management, financial, engineering and technical practices to ensure that the level of service required by customers, and agreed by Council, is provided at the lowest long term cost to the community. The plan is intended to demonstrate to the WDC's ratepayers that Council is managing their assets responsibly and to the agreed price / quality trade-offs resulting 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 plan 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.

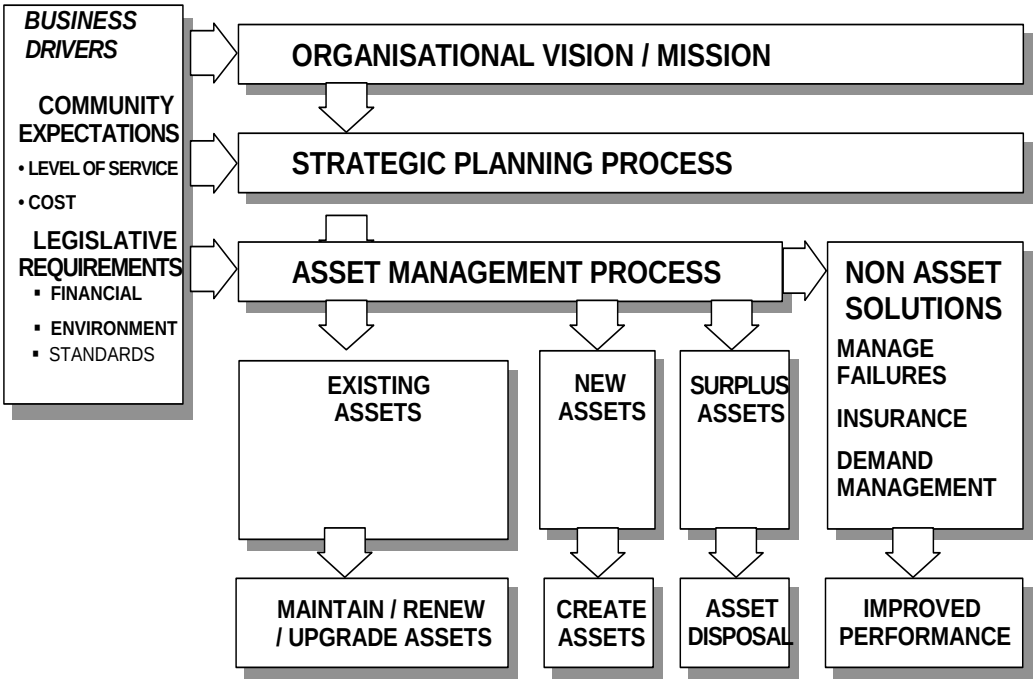


Figure 2.1 Asset Management Plan Process

(Source: NAMS Manual)

This AMP covers the 30 year period from 1 July 2018 to 30 June 2048. The timing of this version of the AMP is consistent with the three yearly review of the Council's Long Term Plan. It is one of a number of 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 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 and asset management staff, and Corporate Services. The project was coordinated and quality managed internally.

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 SW services. By monitoring community service delivery requirements, Council will be better able to develop and manage its assets and ensure community demand and service levels are met in the most effective and timely manner. A program of AM improvement (see Section **Error! Reference source not found.**) will also be undertaken to improve the quality of decision making, the knowledge of assets and customer expectations and the accuracy of the financial projections.

This plan is based on levels of service verified through a survey of key users in August 2011, currently available information and the knowledge of Council staff. The 10 year financial projections have been developed in the knowledge of this information and prudent planning. A programme of continuous AM improvement (see Section 8) will be undertaken to improve the quality of decision making, the knowledge of asset condition and performance data, customer expectations and the accuracy of the financial projections.

Council funding approval is required on an annual basis for all work programmes identified in this plan; hence the actual timing and scope of the works may differ from that shown. Generally the initial three year period provides robust expenditure forecasts whilst the remaining seven years of the plan are considered to be indicative.

2.5 PLAN FRAMEWORK

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

Section Number	Section Title	Description
1	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 storm water activity, the rationale for ownership of the asset components, and the reasons for preparing the AMP
3	The Activity	A description of the assets making up the urban storm water 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 storm water 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 ACTIVITY DESCRIPTION

This AMP covers the urban stormwater infrastructure owned by WDC, which includes the reticulation network, pumping stations, treatment processes and disposal systems

The storm water asset components are defined as urban open drains and stormwater pipes downstream from surface channels, manholes, wing walls, sumps and sump leads on the road network. Culverts and side drains together with associated rural drainage assets are included in the Roading AMP.

This activity covers all SW drainage services in the following urban areas:

- Te Kuiti
- Benneydale
- Piopio
- Mokau – Awakino
- Marokopa
- Te Waitere

3.2 SCOPE OF ASSETS

The information available regarding the scope of assets making up the storm water network is incomplete. Of that, the most up to date information available is for Te Kuiti, which also has the largest proportion of the overall storm water network in the district. Verifying and improving inventory data for Te Kuiti is a high priority for effective management of the activity. Capturing inventory data for the remaining urban storm water assets will not add significantly to the overall asset database.

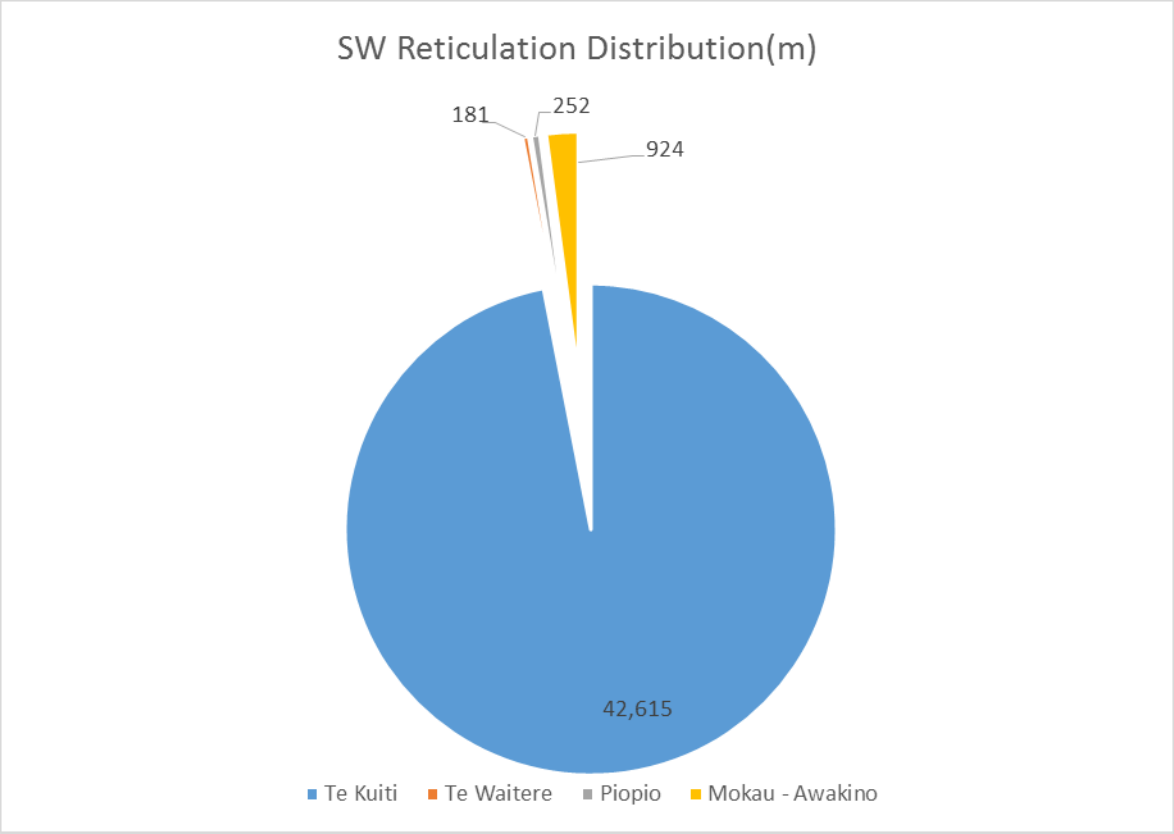


Figure 3.1: Distribution of SW reticulation by location

The SW reticulation is dominated by piped drainage lines varying is size from 100mm diameter to 1800mm dimeter, with the majority of pipes in the 225mm to 600mm diameter range

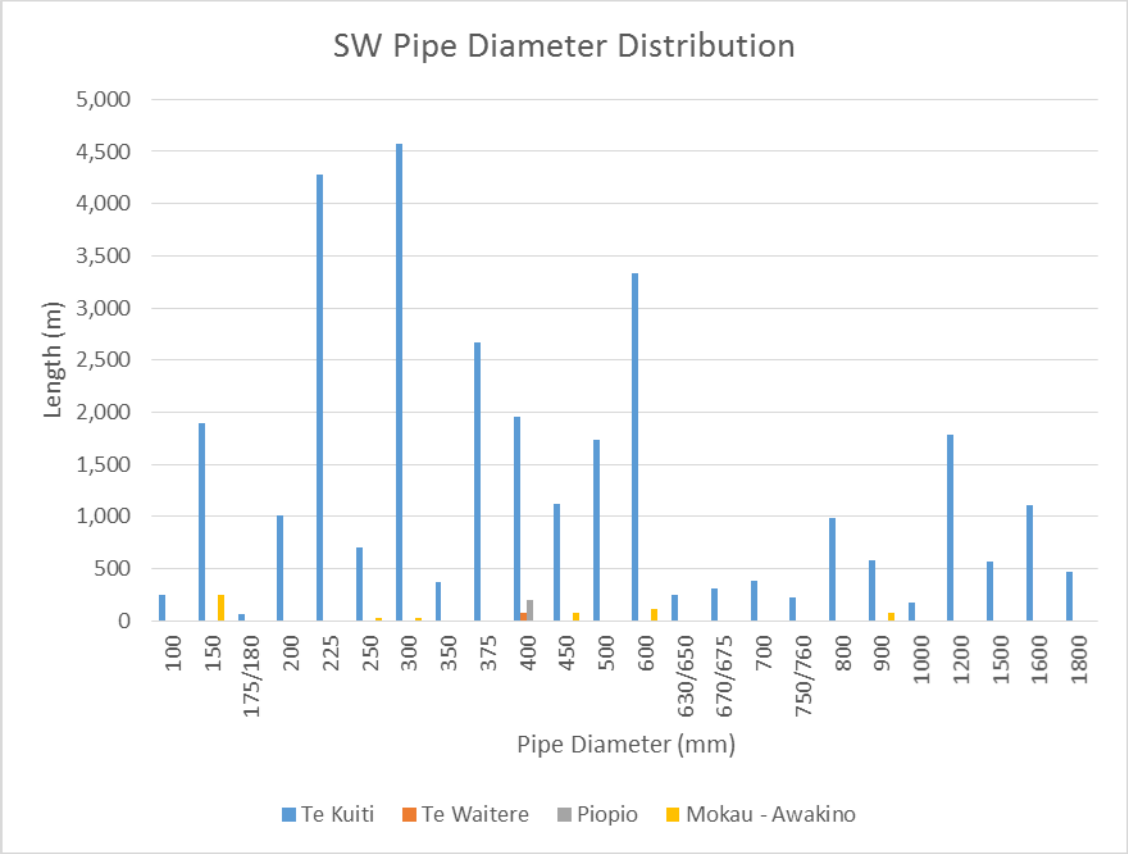


Figure 3.2: Distribution of SW pipe diameters

The total scope of known asset components comprising the urban SW infrastructure includes:

Asset Type	Quantity
Manholes	392
Pump stations	Nil
Sumps	601
Storm water piped reticulation	31,563 m
Open Channel	12,461 m
Outlet structures	8

Figure 3.3: Summary of SW Asset components

The predominant SW pipe material is concrete, followed by PVC. Open channel also forms an important part of the network.

	Un-known	Un-known - default	CONC	BOSS	PVC	CP	MDPE	PE	RC	RIB-LOC	GEW	AC	Open chann.	TOTAL
Te Kuiti	1,140	2,051	23,226	369	1,604	10	14	275	323	203	692	792	11,914	42,615
Te Waitere	0	0	71.6	0	0	0	0	0	0	0	0	0	109	181
Piopio	0	0	193	0	0	0	0	0	0	0	0	0	60	252
Mokau - Awakino	114	0	293		69	0	0	0	69	0	0	0	378	924
Total	1,254	2,051	23,784	369	1,673	10	14	275	392	203	692	792	12,461	43,972

Figure 3.4: Distribution of SW pipe by material type (m)

The bulk of these assets are estimated to reach the end of their effective lives outside the life of the 2018-28 LTP planning period, with a bulge occurring in the 2056-60 period. Given the high value of the assets involved, this replacement profile would not be sustainable without a smoothing strategy - this is dealt with under the lifecycle asset management section (Sections 8.0 and 9.0).

3.3 MANAGEMENT STRUCTURE

The WDC Assets Group manages the urban storm water activity.

3.4 PHYSICAL WORKS & PROFESSIONAL SERVICES DELIVERY

WDC contracts out all non-routine maintenance, renewal and new storm water 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 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 stormwater 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 stormwater 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 STORMWATER ACTIVITY

An inadequate or ineffective urban stormwater system can lead to adverse social, economic and environmental consequences. On a large scale, these effects have the potential to adversely affect the interests of the community.

Flooding of property, overloading of sewers and wastewater treatment plants, and adverse effects on the environment at the point of stormwater discharge, are examples of potential negative effects from the provision of stormwater services.

Positive Effects	**Negative Effects**
Maintaining/improving community health and wellbeing by providing effective surface drainage of urban land and property and reducing the likelihood of wastewater overflows due to storm water inflow into sewerage networks.	Open drains in urban areas can lead to infestations of insects and vermin, and can become a safety hazard. Public access to the piped storm water network through manholes and storm water pipe outlets is a potentially life threatening hazard.
Good storm water drainage planning and design mitigates the effects of the discharge on the environment.	Carbon emissions, dust and spillages of contaminants on urban roading carriageway can enter the drainage network and have an adverse effect on the receiving water.
Effective drainage facilitates enable the use of land for commercial and industrial development.	Cost of compliance with applicable standards.
Facilitates hosting of traditional community gatherings and events during wet weather conditions.	Untreated discharge of storm water to rivers and streams may be regarded as "culturally" insensitive.

Figure 3.5 Effects of Providing Storm water

SECTION 4 – STRATEGIC ENVIRONMENT

4.1 VISION

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

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

4.2 COMMUNITY OUTCOMES

The Storm water 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

- To protect public health and property
- To protect the environment from the adverse effects of stormwater
- To enable economic development

4.4 RATIONALE FOR COUNCIL INVOLVEMENT

This Group activity exists to ensure that the natural environment and district community is protected from detrimental effects of storm water.

The rationale for Council's involvement stems in part from statutory requirements. The legal authority for Council to be involved in the provision of storm water drainage 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 Section 101B requirement to prepare an Infrastructure Strategy for its infrastructure assets, including storm water.

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 interests 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. 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.

WDC's storm water 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) land drainage, rivers clearance and storm water drainage

- ⇨ 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 storm water 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 storm water activity is generally regarded as an essential activity associated with enhancing the District environment and protecting public health and property.

4.5 JUSTIFICATION FOR OWNERSHIP

Council ownership of stormwater infrastructural assets is justified by the following factors relating to the service;

- ⇨ Core Service - Council accepts, via its LTP, responsibility for providing essential infrastructural services. These services include storm water drainage

- ⇨ Public Benefit - the service is generally assessed to provide mainly public benefits

- ⇨ Funding - Council has access to more favourable financing options than is available to the private sector

- ⇨ Exclusivity – it is impracticable to exclude customers from utilising the service by disconnection

- ⇨ Monopoly Supply - in practice urban storm water drainage systems are a natural monopoly as private options (soakage pit, tanker collection, private storm water drainage networks) are generally not viable in the long term and there are no other providers of storm water services.

- ⇨ Equity - Public funding of storm water is equitable, as access to the services for all irrespective of ability to pay is deemed necessary because of the contribution of stormwater services to the health and well-being of both individuals and the wider community

- ⇨ Community Opinion - the public and Council have expressed a preference for key infrastructure assets to remain in public ownership. Council's storm water infrastructure as a whole is included as a strategic asset in its Policy on Significance and Engagement.

4.6 THE EXTENT OF COUNCIL'S RESPONSIBILITY

WDC is the primary service provider for the construction, maintenance and repair of urban stormwater systems within Waitomo District. WDC may maintain the district's stormwater 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 ranging from stormwater pipes to discharge structures. Kerb and channel, sumps and cess pits form part of the roads and footpaths group activity. Council oversees this responsibility by coordinating and contracting physical works to internal and external organisations.

4.7 OTHER RELEVANT LEGISLATION

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

The Local Government Act 1974 allows Council to manage construction, maintenance and use of water courses over private property as required for safe optimal conveyance of surface runoff and protection of Council services.

Other legislation relevant to the Storm water activity includes:

- Public Bodies Contracts Act 1959
- Public Works Act 1981
- Bio-security Act 1993
- The Civil Defence Emergency Management Act 2002 (Lifelines)
- Building Act 2004
- The Building Regulations 1992
- Health and Safety at Work Act 2015

4.8 COUNCIL BYLAWS

WDC has adopted and 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, stormwater and wastewater activities. The stated scope of the WSB is to:

- Protect public health and the security of the public water supply
- Detail the responsibilities of both the Council and the consumers with respect to the public water supply and other water related services
- Ensure the safe and efficient creation, operation, maintenance and renewal of all public water services, sewerage and 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 the District's urban stormwater network. They include:

External

- Council's stormwater maintenance contractor
- Waikato Regional Council
- Ministry for the Environment
- Fish and Game
- Ngati Maniapoto
- Residential and commercial property owners.

Internal

- Councillors
- Chief Executive
- General Manager– Infrastructure Services
- Group Manager – Corporate Services
- Group Manager – Community services

- Group Manager – Compliance
- Finance Manager
- Information Services Manager
- Customer Services Staff

4.10 LINKS TO PLANNING DOCUMENTS

The key internal planning document is Council's 2018 – 2028 LTP which sets out Council's role in maintaining and promoting community well-being in the District. This Asset Management Plan is a "tactical" plan in support of and should be read in conjunction with the Council's LTP, with linkages to the Council's District Plan, structure plans and Council bylaws pertaining to storm water related matters.

The following table summarises the linkages between AM plans and the other key components of the strategic planning and management of Council:

Long Term Plan	The broad strategic direction of Council set in the context of current and future customer requirements, many of which relate to the performance and financial requirements of the assets which are the subject of AM planning. The Activity Management Plan is the means for developing appropriate strategies and policies for the long-term management of Council's assets, and the basis for analysing the impact of Corporate strategic options on levels of service and long term funding needs.
Annual Plan	The Annual Plan is an annual installment of the LTP. The service level options and associated costs developed in the Activity Management Plan are fed into the Annual Plan consultation process.
District Plan	The District Plan regulates the shape and form of sustainable land use and activities pertinent to achievement of the District's environmental outcomes. It identifies and protects anticipated growth areas and formalises urban supply boundaries for utility services. It establishes standards for the construction and protection of the roading network and provides the mechanism for mitigating adverse effects on the natural and physical environment.
Financial Strategy:	Financial plans developed in each Activity Management Plan are consolidated into the financial strategy of Council. AM plans improve financial planning by instigating planned long term maintenance and operating programs and provide justification for works programs and levels of funding.
Infrastructure Strategy	The SW AMP informs the content of WDC's Infrastructure Strategy by considering levels of service, 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 Activity Management Plan become the basis for performance orientated Contracts let for service delivery
Corporate Information	Quality AM 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.

Figure 4.1: Activity Management Plans

The Storm water AMP has synergies with a number of other Council AMPs. The storm water AMP is intractably linked to the Roading AMP, the interface occurring at the point where road sump leads connect to the storm water drain. The levels of service provided to road users can be significantly impacted on by construction and trench reinstatement works associated with storm water, water supply and sewerage underground pipe networks.

Similarly, the urban storm water activity helps to prevent surface water and roof water inflow to 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 stormwater discharge standards.

At an internal level, future work on Council's growth strategy followed by the preparation of structure plans for its urban communities will help define the area boundaries for current and future urban storm water services.

4.11 ASSET MANAGEMENT STRATEGY & POLICY

Asset Management policies and strategies guide and integrate AM practices for the urban storm water activity within WDC.

4.11.1 AM Policy

The current asset management policy states:

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

4.11.2 AM Strategy

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

- Levels of Service: To maintain current levels of service, with specific, minor variations by exception, and to formally review levels of service at least once every three years.
  (Note: Engagement with the community on satisfaction with the levels of service provided and improvements desired will be undertaken periodically. Consultation on options will be undertaken for specific, significant projects. The level of service review will inform the levels of service adopted by the Council.)
- Demand Forecast and Planning: To invest in works for growth in a timely way. Demand forecasts will be reviewed annually based on analysis of population and economic growth projections, social and demographic data, technological advances and other relevant data.

Demand management options will also be considered when planning to meet growth to enhance sustainability of asset capacity and natural resources and to ensure projects qualify for any external financial assistance.

- Asset Service Potential: To maintain the current service potential of the asset through an appropriate level of maintenance and renewal works.

- Risk Management and Resilience: To manage risk exposure through:
  - Undertaking performance and condition monitoring of critical assets
  - Assessing resilience of critical assets to natural hazards
  - Identifying and managing risks relating to natural hazards and preparing programmes to address those risks.

- 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

ISSUE	EVIDENCE	REFERENCES	PROGRAMME IMPLICATIONS	COMMUNITY OUTCOME LINKAGE
Low confidence in accuracy and completeness of asset data.	Spatial and condition data partially anecdotal and incomplete	Clause 8.2 and 9.20	CCTV inspections of pipe attributes and conditions, part funded from renewals budget	Sustainable infrastructure.

ISSUE	EVIDENCE	REFERENCES	PROGRAMME IMPLICATIONS	COMMUNITY OUTCOME LINKAGE
Condition of SW network.	In 2012, Council committed to use part of the renewals program funding to both clean out and undertake closed-circuit television (CCTV) in SW pipelines to improve service and assess condition. The clearing and CCTV has since been concluded and the asset condition data obtained provides the basis for improvements, renewals and repairs.	Clause 8.5	The identified repair work is continuing with several SW pipelines repaired, replaced or upgraded in the period since 2014. Once the remaining repair work has been completed, further clearing and CCTV work will be done as funds permit. Historical issues are also being addressed. The indicative renewals program identifies two large peak periods in relation to renewal requirements for the SW pipe assets. The first is in 2040-2045 and the second, which has an even more significant peak, in 2060–2075. A renewals program matching that profile would be difficult to afford or sustain. Smoothing the profile and thus expenditure over a life cycle of 80 years has been recognised as the most viable option, both financially and practically.	Sustainable infrastructure.
Catchment management planning.	The effectiveness of the Te Kuiti SW drainage system is dependent on flow levels in the Mangaokewa Stream. During flood conditions (e.g. the 1958 flood), stream levels will back-flow via SW pipe outlets and surcharge within the urban area.	Clause 8.6	Detailed survey and catchment modelling of each urban catchment area within Te Kuiti will therefore be required to enable identification and mapping of secondary flowpaths. A prioritised program of works to address any identified capacity/protection shortfall, including protection of secondary flow paths and environmental protection works to mitigate adverse effects at the points of discharge, would be derived from this work and will require funding to implement.	Sustainable infrastructure. Vibrant communities.
Climate change.	Increased frequency and intensity of rainfall is expected as a general trend across much of the district, and in particular, along the west coast of New Zealand. The latter could impact negatively on the district's beach communities mainly through impeded storm water drainage due to rising sea levels and surcharging at storm water outlets.	Clause 7.5.1	Optimised replacement strategy will ensure that current levels of service are maintained.	Sustainable infrastructure. Vibrant communities.
SW Discharge consent	The current SW Discharge Consent expires on 1 July 2024 – half way though the 2018-28 LTP planning period. Application documentation will need to be submitted to Waikato Regional Council no later than 1 January 2024 to ensure continuation of SW discharges while the consent is processed.	Clause 8.4.1 and Clause 8.6.	CMPs are expected to be a requirement for the renewal application and will need to be prepared in advance. Project funding has been allowed in the LTP budget	Vibrant communities.

Figure 4.2: Strategic Assessment

SECTION 5 - LEVELS OF SERVICE

5.1 INTRODUCTION TO LEVELS OF SERVICE

Levels of service are defined in the NAM's International Infrastructure Management Manual as the identified service quality for a particular activity (e.g. stormwater) or service area (e.g. discharge quality) 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 scope and scale of services provided by the activity:

5.2.1 Statutory and regulatory requirements

Statutory requirements set the minimum standards of service which the water supply 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

5.2.1.1 Local Government Act 2002

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) water supply. The following sections further specify the powers and responsibilities of Council with respect to water supply services:

- Section 125 requires that Council undertake an assessment from time to time of water and other sanitary services within its district
- Section 130 establishes the obligation for Council to continue to maintain water services
- Sections 131-135 provide for the closure or transfer of small water services
- Section 136 provides for the contracting out of water services
- Section 137 provides for joint local government arrangements and joint arrangements with other parties for the delivery of water services
- Section 181 empowers Council to construct work on private land that it considers necessary for (inter alia) reticulated water supply and the supply of water through water races.
- 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'.

5.2.1.2 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 storm water 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.

5.2.1.3 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.

5.2.1.4 Health & Safety at Work Act 2015

Council must ensure the safety of the public and all workers (including contractors) when carrying out inter alia, water supply works.

5.2.1.5 Building Act 2004

The Act requires WDC to ensure all buildings and facilities constructed comply with this Act, including the provision of sanitary services and fittings.

5.2.2 Council Bylaws

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

5.2.3 Customer expectations

Customers require that urban storm water drainage is provided at agreed levels of service supported through adequate infrastructure maintenance, management and construction services delivered reliably, efficiently and economically. The use of AM techniques provide 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 Environmental Responsibility

WDC is required under the provisions of the Resource Management Act to provide stormwater services in an environmentally responsible manner. The current SW discharge consent expire on 1 July 2024. 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 stormwater assets.

5.2.5 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.

5.2.6 Safety

Asset management planning addresses WDC'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.

5.2.7 Financial Responsibility

The Local Government Act 2002 places an emphasis on the preparation of long term financial strategy. 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 the 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 development of the optimised work programs and resulting long term financial plans in this AMP for the management of WDC's urban storm water infrastructure is the mechanism used to define the LoS for the storm water activity.

5.2.8 Efficiency and effectiveness

Council manages the urban stormwater 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 efficiency and effectiveness by:
- providing a basis for monitoring asset capacity, 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 treatment selection.

5.2.9 Corporate Profile

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

The first step is to identify the key service criteria for each service area from the customer's perspective (the objectives of the services provided) and identify defined 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**
Outcome related - measures define what the customer receives in an interaction with an organisation	Process related - measures define how the customer experience the service
Quality	Intangibles
Quantity	Responsiveness
Availability	Courtesy
Legislative requirements	Assurance (knowledge, trust, confidence)
Maintainability	Empathy (understanding, individual attention)
Capacity	
Reliability and performance	
Environmental impacts	
Cost / affordability	
Comfort	
Safety	
Reliability and performance	

Figure 5.1: Levels of Service

5.3 STATEMENT OF SERVICE PERFORMANCE

The development of this AM plan has been based on a combination of technical levels of service, using internal knowledge and experience of such matters, and functional service levels. The following levels of service, performance measures and targets correspond to the DIA mandatory measures for the stormwater 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	Stormwater drainage system is adequate and is sufficiently maintained.	The number of flooding events* that occur in the district in a financial year.	Nil (for less than 1 in 2 year event) / Achieved (0)	Nil (for less than 1 in 2 year event)	0	0	0	0
		For each flooding event* the number of habitable floors affected in a financial year.	≤ 1 per 1000 properties / Achieved (0)	≤ 1 per 1000 properties	≤ 1 per 1000 properties	≤ 1 per 1000 properties	≤ 1 per 1000 properties	≤ 1 per 1000 properties
Vibrant Communities CO5 Effective Leadership CO8 Sustainable Infrastructure CO10	Compliance with resource consent conditions for discharge from the Councils urban stormwater system that relate to environmental effects	Compliance with resource consents for discharge from its Stormwater system, measured by the number of the following *(received by Council within a financial year)*:						
		• abatement notices	0 / Achieved (0)	0	0	0	0	0
		• infringement notices	≤2 / Achieved (0)	≤2	≤2	≤2	≤2	≤2
		• enforcement orders	Nil Achieved (Nil)	Nil	0	0	0	0
		• successful prosecutions	Nil / Achieved (Nil)	Nil	0	0	0	0
Vibrant Communities CO5	The Council responds to failures and request for service in a prompt and efficient way	The median response time to attend a flooding event*, (measured from the	≤ 180 minutes (3hrs) / Achieved (0)	≤ 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**
Sustainable Infrastructure CO10		time that the notification is received to the time that service personnel reach the site)						
Vibrant Communities CO5 Sustainable Infrastructure CO10	The Council provides a reliable stormwater collection service	The number of complaints received about the performance of the Council's urban stormwater system per 1,000 properties connected.	≤4 complaints per 1000 properties / Achieved (2.9)	≤4 complaints per 1000 properties	≤4 complaints per 1000 properties	≤4 complaints per 1000 properties	≤4 complaints per 1000 properties	≤4 complaints per 1000 properties
	** A flooding event means an overflow of stormwater from a territorial authority's stormwater system that enters a habitable floor. Habitable floor refers to a floor of a building (including a basement) but does not include ancillary structures such as stand-alone garden sheds or garages.*							

Figure 5.2: Levels of Service

Target levels of service proposed by Council are communicated to the public and key stakeholders via its draft LTP/Annual Plans. 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.

5.4 CUSTOMER RESEARCH AND EXPECTATIONS

Key to effective activity management planning understands customer needs and expectations. To date customer contact has been in the form of:

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

Customer satisfaction surveys were commissioned annually from 2009. Not all WDC services were surveyed, with the stormwater activity surveyed in 2011 and 2012. The surveys in 2013 and May 2014, did not measure satisfaction with storm water services.

Whilst results prior to 2009 are available, they were measured on a different scale and direct correlation with more recent results is not achievable.

The results of the most recent surveys, in 2011 and 2012, are tabulated below and show a similar pattern. The top two results show a decline in satisfaction over the two years, although noting the high percentage of "don't knows" in 2012.

Year	Very Dissatisfied	Dissatisfied	Satisfied	Very Satisfied	Don't Know	Top Two
2011	4%	18%	58%	15%	6%	73%
2012	3%	10%	52%	13%	22%	65%

Figure 5.3 Customer Satisfaction

Not surprisingly, flooding and inadequate drainage/needs upgrading are the typical reasons given for dissatisfaction with stormwater services.

Example comments include:

- *Always a lot of flooding when it rains, especially in corners of town (Te Kuiti?)*
- *Every time it rains I can't flush my toilet*
- *The pipes aren't big enough and the water sometimes doesn't drain fast enough. It could be improved*

5.5 EXPECTATIONS VERSUS CURRENT LEVELS OF SERVICE

The above comments are typical for stormwater services, and give an indication of the type of problem that exists and the public perception that a stormwater system should deal with all events. That particular expectation is not economically feasible.

Customer satisfaction surveys tend to be of minimal use in AM planning because of their subjectivity and lack of specific feedback on levels of service, priorities, location and willingness to pay. They tend to measure customer satisfaction with the services provided at the time, rather than provide information on the service levels desired. A first order attempt to identify the gaps, if any, between desired functional levels of service and current levels of service was completed using a telephone survey of key users and stakeholders in August 2008.

The key findings in relation to the key functional aspects of the stormwater service were, however, generally positive. Of the responses that were received, Council responsiveness to complaints and capacity of the stormwater drainage network to cope with heavy rain reflected the key areas for improvement, as illustrated below:

Storm water Service	**Rating**			
	Excellent - good	**Average**	**Poor - very Poor**	**Don't Know**
Quality of storm water network	17%	50%	17%	17%
Adequacy of storm water network to cope with heavy rain	42%	25%	17%	17%
Surface water drains quickly from my property	50%	17%	33%	0%

Responsiveness to complaints and enquiries	23%	24%	15%	38%
Maintenance of urban storm water network	37%	34%	19%	10%

Figure 5.4: Customer Satisfaction

5.5.1 Gaps in levels of service

The main gaps expressed in the current levels of service of the stormwater service were varied with limited feedback. A number of residents rated the service as fine as it is, but that was likely to be influenced by geographical location. The following relevant responses were received to the question of, "What improvements do you think the Council could make to the urban stormwater system in the next 12 months?"

- *Keep it clean and keep up repairs and maintenance.*
- *Just keep it clean.*
- *Make it drain off properties and driveways a bit more quickly*
- *Get them clearer and flowing so water can drain away.*

5.5.2 Process for addressing gaps

Identified areas for improvement relate mainly to the effectiveness and speed of drainage from properties. Addressing these issues will require additional capital investment, with Council needing to consider priorities for improved stormwater drainage in areas having high inflow to urban wastewater systems.

More attention to the way services are provided also appears to be a major gap in current levels of service e.g. improved responsiveness to enquiries and complaints. This should be a simple but effective measure to address, within existing resources, through staff training and contractor performance monitoring.

The relationship between agreed levels of service, customer expectations and willingness to pay are important to the management of the assets. In this context, a full service delivery review across the full range of Council activities would add to current information and knowledge and to provide a basis for comparing the relative acceptance of different levels of service with cost. It should include:

- The aspects of storm water services most valued by customers
- The special user needs of groups and individuals
- 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 storm water compared with other Council services.

SECTION 6 - FUTURE DEMAND

6.1 ANTICIPATED CHANGES IN DEMAND

The main drivers of demand for stormwater 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

6.1.1 Population growth

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: Dwelling and Rating Unit Growth – Medium growth scenario

6.1.2 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.

6.1.3 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.

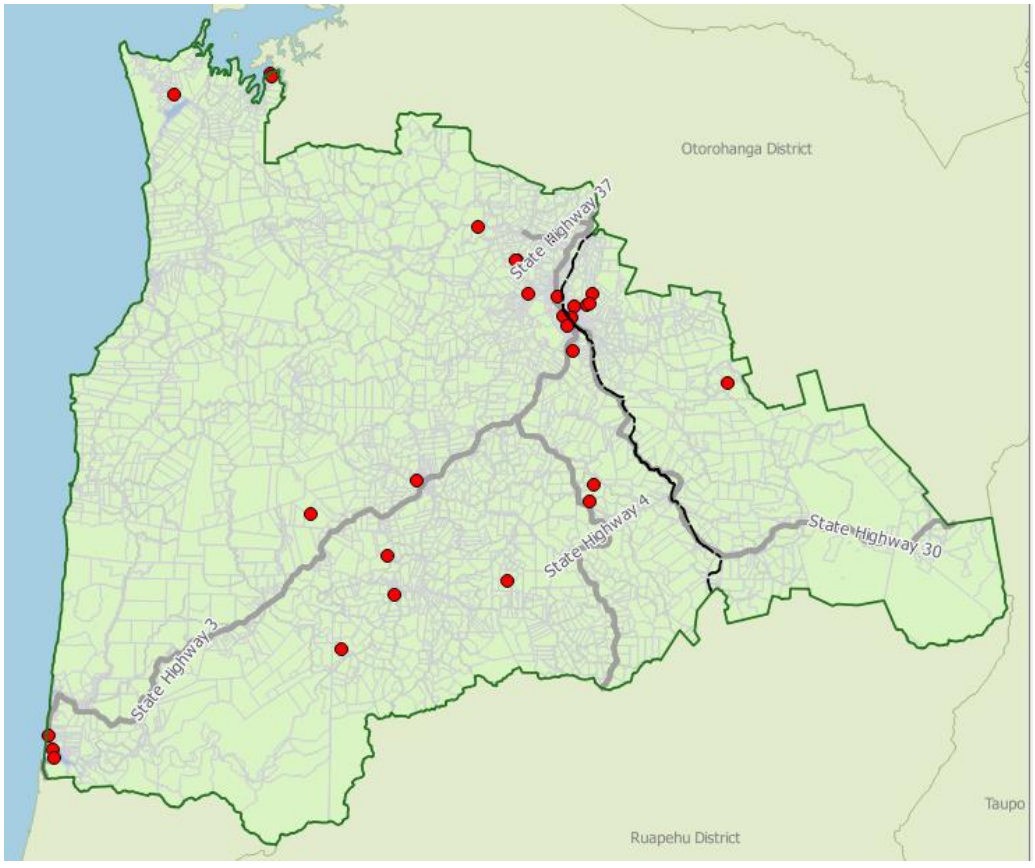
With reticulated sewerage in place, infill development can occur in residential areas as a permitted activity, with minimum lot sizes reducing to 300m^2. In a "Greenfield" residential development with reticulated sewerage, the minimum lot size is 600m^2. No similar restriction applies in the case of 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 sub divisional 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.

6.1.4 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. Higher intensity rainfall has been noticed in recent year with short duration heavy rain spells occurring.

The impacts of climate change might also contribute to a reduced ability for the stormwater system to cope with increased flows, particularly at the those beach communities where stormwater outlet points are within tidal zones due to the now widely accepted predictions of rising sea level.

6.1.5 Community Expectations

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

- Continued public pressure for higher standards of water quality in receiving waters.
- Increasingly stringent resource consent conditions for storm water discharges.
- High infiltration/inflow rates per head of population resulting in overloaded sewer pipes.
- Increased infiltration/inflow as the storm water network ages.
- Demand for greater distribution of public storm water systems to cope with the effects of climate change on rainfall patterns and intensity (see below).
- Impacts of climate change on rainfall patterns, runoff coefficients rising sea levels and hence, network capacity

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

- Extension of storm water networks to new urban areas will be funded by developers
- Increased demand on the capacity of storm water networks cannot be accommodated without substantial upgrading.
- Future upgrades associated with the growth of the storm water networks will be minor within the planning period.
- Most of the storm water schemes are very small. Even the largest of the schemes, at Te Kuiti, is of average size compared nationally. Significant changes to LoS could have material impacts on costs to ratepayers (e.g. new resource consent conditions)
- Increasing demand for improved storm water drainage systems at all urban areas
- Potential vesting of the Waitomo Village storm water system in Council ownership

6.2 DEMAND MANAGEMENT STRATEGY

Council is desirous of managing growth to avoid an ad-hoc pattern of development, with its cumulative impact on the local natural landscape and an inevitable liability in years to come, requiring replacement of the existing, self-contained, water supply, stormwater and wastewater disposal arrangements, with public services.

The strategy is to avoid ad-hoc connection to the existing SW networks that will jeopardise downstream capacity, and the risk of additional expense for the ratepayers who funded the original capital cost of the schemes. Planning and quantifying future development, consistent with a

development strategy that facilitates implementation of the future vision and form of the district, is necessary.

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 would feed into a future review or change to the District Plan, are needed to provide guidance for developers and to help manage the design capacity of the respective urban stormwater schemes.

A development strategy at a very high level was mooted in 2008 for the 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 existing subdivisions or subdivisional consent applications. Introduction of reticulated water and sewerage to service the combined area would open the door for infill subdivision to occur down to a minimum lot size of 300m2 and this would impact on the stormwater drainage requirements for these small settlements. Without reticulated sewerage, the minimum lot size is 2500m2.

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, at the apex end of the peninsular, may be investigated over the next ten years. This would facilitate infill development as for Mokau – Awakino. A project to investigate stormwater and water supply options for this settlement will be needed in the future, partly driven by the consequential requirements of the Health (Drinking Water) Amendment Act for supplies to permanent populations of 16 or more people and associated new drinking water standards. This is expected to happen after the planning period.

The expected growth at Waitomo Village has also been investigated. However, the stormwater, water and wastewater infrastructure is held in private ownership and is therefore not currently part of Council's asset management responsibilities. Discussions with the owners has spanned several years, and is ongoing. Due to the age, condition and performance of the existing water and wastewater services, it will have to be completely replaced and upgraded, or substituted with alternative services. In addition, long term tenure of the land on which the infrastructure is located is a complex issue, currently locked into a perpetual lease held by Tourist Holdings Limited. The development of a preliminary proposal to provide services to this area was expected to be considered in the context of the 2018-2028 LTP but this is now looking increasingly unlikely. Before a proposal could be implemented, full infrastructure design including stormwater would need to be developed.

In Te Kuiti, a 37 lot residential subdivision in early 2008 at the north-west end of Te Kuiti continues to help fill the gap in the housing market created by a predominantly ageing housing stock for a considerable time. The stormwater infrastructure required to manage the impact of this additional housing development on existing stormwater infrastructure has been addressed through appropriate design and construction of the services for the sub division.

The following strategies have been adopted for managing stormwater service demand;

- ⇨ Catchment Assessments: There is a dearth of information regarding the age, condition and performance of the urban storm water reticulation. Current information has been drawn from limited existing records, overlain with a desktop exercise involving input from contractors and staff to capture and record local knowledge. Similarly, catchment discharge and system capacity is not known. An early priority in the Improvement Plan will be a project to prepare Catchment Management Plans on a catchment by catchment basis according to the severity and impact of known problems, to ascertain and compare design runoff with existing system capacity and determine overland flow paths for high rainfall events. Investigative techniques used will include, (as appropriate), visual inspection, CCTV inspection, and peak flow calculations. A gap analysis of the findings will provide the basis for future capacity improvements.

- ⇨ Ecological assessments: The Catchment Management Plans to be developed will include an environmental assessment of each storm water drain and receiving water to identify and assess any ecological sensitivity and determine the appropriate form of environmental amenity of such streams and or drains.

- ⇨ Resource Consents: Waitomo District Council holds a Comprehensive Discharge Consent valid until 1 July 2024, with established standards for storm water quality, and disposal methods

which reflect a balance with the wider community's wishes for environmental protection, public nuisance and affordability.

Alternatives to asset based solutions for overcoming existing and anticipated demands for stormwater activities include the following non asset solutions;

- ⇨ On site disposal**:** On site disposal to ground is considered to be an appropriate non-asset solution in areas where ground soakage is practicable. Waitomo soils are not free draining and therefore have limited capacity for soakage, and any resulting localised perching of groundwater could increase infiltration of the adjacent wastewater network.

- ⇨ Storm water detention areas**:** In some instances, storm water runoff can be channeled through storage areas which double as community amenity areas. The resulting flattening of peak flows translates into reduced demands on pipe and flow path capacity. The feasibility of this can only be scoped following robust planning utilising information from Catchment Management Plans.

6.3 ADDITIONAL ASSET CAPACITY REQUIRED

(Growth related, including new assets and asset improvements due to growth)

There is little or no net growth expected over the term of this AMP.

Areas which could benefit from reticulated or improved stormwater services in the long-term are summarised below:

6.3.1 Te Kuiti

Te Kuiti has a reasonably comprehensive storm water network servicing all parts of the town, although there are pockets that do not have immediate/direct connection to the system. The network consists of a mixture of open drains and pipes. There are deferred maintenance items which will be progressively addressed within budget limitation - more are expected to become apparent as network knowledge improves.

6.3.2 Benneydale

There is very little storm water infrastructure and what is there is mainly related to the roads. The town would benefit from a structure plan ahead of any potential growth (eg as a result of the new tourism activity associated with recent opening of the Timber Trail, Pureora to Ongarue, cycle trail) to guide future planning processes and existing services further investigated to improve asset data, as resources permit.

6.3.3 Piopio

A limited urban storm water drainage network services the town, with pockets that do not have immediate/direct connection to the system. The network consists of a mixture of mainly open drains with some pipes under roads. The town needs a structure plan to manage future planning purposes and existing services further investigated to improve asset data, as resources permit.

6.3.4 Mokau

Mokau has limited storm water infrastructure and what is there is mainly related to the roads. The town needs a structure plan to manage future development planning purposes and existing services further investigated to improve asset data, as resources permit.

6.3.5 Awakino

There is very little storm water infrastructure, a few open drains and what pipe work is there is mainly related to the roads. The town needs a structure plan to manage future development planning purposes and existing services further investigated to improve asset data, as resources permit.

6.3.6 Marokopa and Aria

Marokopa and Aria have very little storm water infrastructure - a few open drains and a small length of piped reticulation mainly servicing the local roading network. These two towns need a structure plan to manage future development planning purposes and existing services further investigated to improve asset data, as resources permit.

6.3.7 Te Waitere

There is very little storm water infrastructure at Te Waitere and what is there is mainly related to the roads. The town needs a structure plan to manage future development planning purposes and existing services further investigated to improve asset data, as resources permit.

6.3.8 Waitomo Village

The expected growth at Waitomo Village has also been investigated. Storm water infrastructure in this area outside that related to council roading infrastructure through the Village, is probably held in private ownership and therefore is not currently part of Council's asset management responsibilities. Discussions with the owners have taking place over the years with regard to water and sewer. There is currently no formal service proposal for this area.

6.3.9 Taharoa

The infrastructure at Taharoa is privately owned and managed. This area does not form part of this AMP.

The financial implications of the above are summarised in Section 10 of this AMP.

6.4 HOW PROVISION OF ADDITIONAL ASSET CAPACITY WILL BE PROVIDED

Local infrastructure, such as new stormwater mains, is generally put in place by developers and then vested with Council for ongoing management and maintenance.

The growth related component of the capital cost of providing additional assets or increasing the capacity of existing WDC infrastructure, will be apportioned, and could be recovered using financial or development contributions.

All stormwater construction projects will be undertaken by contractors, with contracts awarded in accordance with Council procurement procedures.

Council has included in its 2018 - 28 LTP the estimated cost of the identified renewal projects. In addition, the Financial Summary in Section 10 provides for limited improvements to current levels of service, such as piping of open drains in residential areas, rather than increased stormwater capacity.

SECTION 7 - RISK MANAGEMENT

7.1 RISK MANAGEMENT CONTEXT

Stormwater risk identification and management 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 impacts, where other service providers are not providing services which 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
- Risk to public e.g. manholes, open drains

As well as direct impacts on assets, the events will usually pose a risk by impacting directly or indirectly on customers and possibly others.

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 related directly 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)

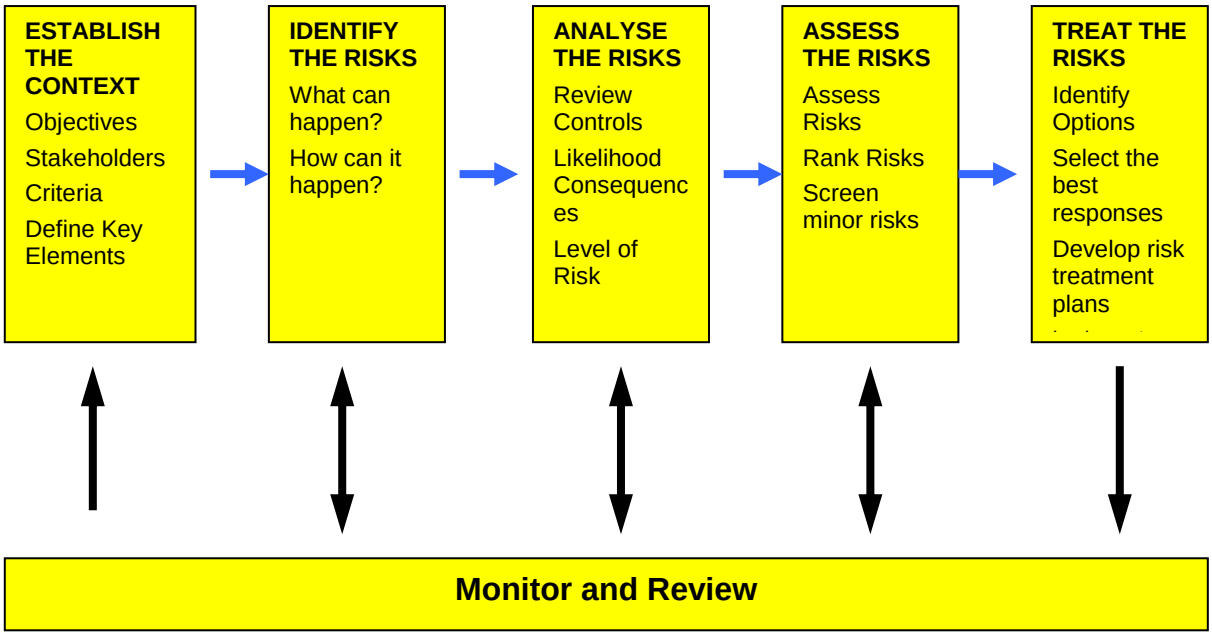


Figure 7.1: Risk Management Chart

7.2 RISKS TABULATION

The following table lists the risks rating matrix:

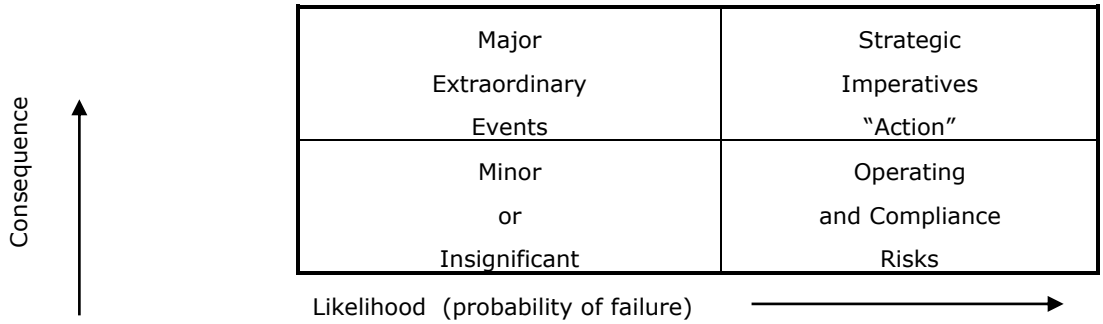


Figure 7.2: Risks Table

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 stormwater 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

Table: Risk Rating

Figure 7.3 Risk Matrix

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, 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 dependant on treatment cost
Low Risk	Manage by routine procedures

Figure 7.6: Risk vs Action

7.4 CRITICAL ASSETS

The critical urban stormwater assets have been defined as those which would have the greatest consequences, including major impact on minimum environmental and public health service levels, in the event of failure. They include open drains and trunk mains

The stormwater drains in the central business zone of Te Kuiti were perceived to be under capacity Some renewal and some augmentation work has been done and the heavy, concentrated rainfall events, such as during the 2013 and 2014 period, proved that the system is relatively robust with little adverse effects after a rain storm and no surface flooding attributed to the WDC operated stormwater system.

Additional consideration should also be given to those assets in the Risk Assessment table below having high criticality.

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.

7.5.1 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 IMPACT OF RISKS ON PROGRAMME FUNDING

The funding of measures to protect storm water 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 is recommended over the next three years as part of the AMP Improvement Plan to quantify and prioritise priorities within available budgets.

7.7 RISKS AND RESILIENCE IMPROVEMENT PLAN

Aspects that require further development include:

- Completion of catchment management assessments.
- Further investigation and better information about the 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

Risk Description	Consequence		Likelihood	Risk Rating	Best Management Option	Consequence when managed		Likelihood when managed	Managed Risk Rating	Action Plan
Siltation of Mangaokewa River	Reduction in hydraulic capacity	**3**	2	Moderate	Clearing and Liaison with Waikato Regional Council	Much reduced risk of overflows	**2**	2	Low	**C**
Rising sea level	Reduction in hydraulic capacity at coastal settlements	**3**	2	Moderate	Liaison with Waikato Regional Council	Much reduced risk of overflows	**3**	2	Moderate	**C**
Extreme rainfall event (1% AEP)	Flooding	**4**	2	High	Initiate a civil defence emergency management plan	Flooding, with reduced impact	**4**	2	High	**B**
Resource consent requirements for treatment of discharges	Large capital cost implication	**3**	7	High	Prepare and carry out programme for installation and cleaning of interceptor devices and install detention areas.	Greater control over spills and contaminants entering water ways	**4**	1	High	**B**
Collapse of Stormwater structure	Structural failure of specific culvert	**2**	5	Moderate	Routine inspection of specific structures	Much reduced risk of failure	**2**	1	Low	**B**

Figure 7.7: Storm water Risk - Reticulation

1= Negligible. 2= Minor. 3= Moderate. 4= Major. 5 = Catastrophic.

SECTION 8 - LIFECYCLE MANAGEMENT PLANS

8.1 INTRODUCTION

This Section describes the asset management plan for the urban stormwater activity, including:

- 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 3 and demand projections of Section 6.
- The needs, timing and costs of operational, maintenance, renewal, acquisition and disposal works required to action the life cycle asset management strategies developed in this Section.

The scope of stormwater assets consists of open drains, pipes, manholes, and discharge structures in urban areas. They exclude kerb and channel, sumps/catchpits and sump leads in urban areas, and rural drainage assets (culverts etc) which form part of the Roading AMP.

A desk-top programme in 2008 to collect and collate asset data resulted in a reasonably complete schedule of information held on pipe lengths, diameters, material types and manhole locations for Te Kuiti. However, the confidence level is low and most of it needs to be verified. The same degree of information is not yet available at the remaining urban townships. Against that, most of the urban stormwater assets are located in Te Kuiti.

In all cases, there is little or no hard engineering data available on asset condition and specifically performance of network sections or the network as a whole. A long term programme to progressively collect this information is a high priority in the AMP improvement plan.

The privately owned stormwater assets (and other key infrastructure) at Waitomo Village and Taharoa do not form part of this AMP.

The strategies are translated into detailed work programmes and budget projections for the urban stormwater scheme summarised in Section 10.

8.2 TE KUITI STORMWATER ASSET INVENTORY

Te Kuiti (population 4,200) is the only urban area in the Waitomo District which has a significant stormwater drainage system comprising some 27 km of pipe, 3 km of open drains and 374 manholes, 562 cesspits. Sump leads, which do not form part of this plan, comprise some 540 metres.

The town of Te Kuiti is established along the banks of the Mangaokewa stream. The centre of Te Kuiti is a very flat area, climbing to much steeper land in the surrounding hills. It is estimated that the total catchment area of the town is approximately 300 hectares. Whilst industry is represented, the major land use is residential in nature.

The existing stormwater system consists of a system of pipes and open channels which discharge into the Mangaokewa Stream. There is no treatment of stormwater runoff from residential or commercial areas. However there are interceptor units and grease pits installed on most industrial and commercial sites such as petrol stations, truck wash platforms and food preparation premises controlled through the trade waste bylaw.
Field checks and comparison with as-built plans continue to be updated to improve the verification of accuracy of inventory data.

An hydraulic model of the stormwater system in Te Kuiti was carried out and reported in March 2001. This model showed that most of the system will accommodate a 50% (i.e. once every two years) AEP event but that events exceeding that will result in progressively widespread overloading of the system with widespread shallow flooding of the low lying flat regions of Te Kuiti. This flooding, although widespread, would not of itself be life threatening.

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

Asset Type	Asset Component	Condition Grading	Performance Grading	Condition Data Confidence	Expected Economic Life (years)
Reticulation	Pipelines (Concrete)	2	2	D	80
	Pipelines (AC)	2	3	D	60
	Pipelines (uPVC)	2	2	D	80
	Pipelines (Ribloc)				50
	Service connections	4	3	D	70
	Manholes	2	2	B	80

Figure 8.1: Asset Performance and Condition Grading – Te Kuiti

Condition and performance gradings range from 1 (excellent) to 5 (very poor/failure mode).

Data confidence grades range from A (highly reliable) to D (very uncertain).

Overall, the table shows that the existing stormwater assets in Te Kuiti are in reasonable condition and performing satisfactorily, but with low level confidence as to the reliability of these assessments. Service connections and AC pipes are the main areas of priority based on this information.

8.3 ASSET PERFORMANCE

8.3.1 Environmental Standards

The largest pollution risk in terms of urban stormwater discharges will come from industrial sites or accidental spillages due to accidents etc. on the transport network. In rural areas, agricultural runoff into waterways is problematic. It is desirable that pollutants are controlled at source so that actual and potential pollutants can be identified and treatment designed to suit the particular pollutant. Litter traps may need to be implemented on stormwater emanating from the CBD area of Te Kuiti. An investigation is underway to determine appropriate mitigation structures before entering the Mangaokewa River, with each structure estimated to cost in excess of $100,000. There are 11 potential sites.

8.3.2 Reliability

The District Plan contains maps showing the area at risk of flooding in Te Kuiti from the 1% AEP event.

8.3.3 Capacity

It is known that there are undersized assets within the reticulation and this will be identified as part of the Catchment Management Plans and addressed in the improvement plan for rectification in due time.

8.3.4 Safety

The main safety concerns are access to large stormwater pipes at the discharge end of catchment areas and open drains across private property.

8.4 STORMWATER ASSET OPERATIONS & MAINTENANCE PROGRAMME

8.4.1 Operations

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 in the maintenance contract. The majority of the processes and decision-making is based on local knowledge and the judgment of experienced staff drawing from available historical information and recognised analytical procedures. Inadequacies in current data needed to support more robust decision making is addressed in the AM improvement programme contained in Section 8.

The 30-year financial projections for operations and maintenance work are summarised in the financial summary section.

Operational Strategies

- ⇨ Complete Catchment Assessments for each urban area including design runoff calculation, verify existing system in each catchment, and preliminary identification and mapping of secondary flow paths.

- ⇨ Prepare Catchment Management Plans, entailing calculation of the design runoff, identification of gaps and capacity limitations of the existing stormwater network at each location, identification and protection of (through the use of easements, district plan rules etc) secondary flow paths and an assessment of the impact of each flow path on the relevant properties.

- ⇨ Prepare and apply for consent renewal in 2024

- ⇨ Prepare quality AM plans based on a sound knowledge of customer needs and preferences

- ⇨ Optimise asset management practices and decision-making;
  - ⇨ Review computer based asset management systems
  - ⇨ Document existing, and develop new business processes
  - ⇨ Continue to collect AM data (physical attributes, asset performance/ condition, and costs)

- ⇨ 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 storm water assets and, as necessary, carrying out material testing. Operate stormwater assets in accordance with current resource consents.

- ⇨ Minimise asset ownership costs by:
  - ⇨ considering all life cycle costs, including operational costs, when evaluating asset renewal/ acquisition options
  - ⇨ 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.

Operational Standards and Specifications
Operate assets in compliance with:

- ⇨ this AM plan
- ⇨ defined processes and procedures
- ⇨ resource consents
- ⇨ statutory requirements.

8.4.2 Maintenance

Maintenance can be defined as that group of activities that help preserve an asset in a condition which allows it to perform its required function.

Maintenance is the regular work and immediate repairs necessary to keep the asset operational.

The ongoing efficiency of the 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 storm water 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 reticulation cleaning programs) ⇨ On-condition maintenance carried out as a result of condition or performance evaluations of assets and asset components (e.g. manhole cleaning, sign cleaning etc).

Figure 8.2: Definition of maintenance categories

Deferred Maintenance
Deferred maintenance occurs when either planned or unplanned maintenance is not carried out, leading to an increased requirement for planned maintenance or renewals in future years. There are a number of historic deferred maintenance items to be dealt with, blocked pipes etc

8.4.3 Funding of Operations and Maintenance

Operations and maintenance costs are 100% funded from targeted uniform annual charges split 85% (urban) and 15% (rural) rating areas respectively.

8.4.4 Mode of Service Delivery

Maintenance works are undertaken by a mix of external contractors and an internal services unit as required in accordance with Council procurement procedures.

8.5 STORMWATER ASSET RENEWAL PROGRAMME

Asset renewal is major 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 which increases the design capacity of assets is defined as upgrading/development work.

The renewal programme is based on the estimated remaining useful lives of the various SW assets. Given the relatively large diameter of stormwater pipes compared to sewerage pipes, the cost per unit length of pipe is high. A replacement programme to achieve this will not be

affordable or sustainable without phasing of the work over a longer period of time than the asset age profile currently suggests. This recognises that in practice, some stormwater pipes will need replacement earlier than would normally be expected, while others will extend beyond the nominal useful life range.

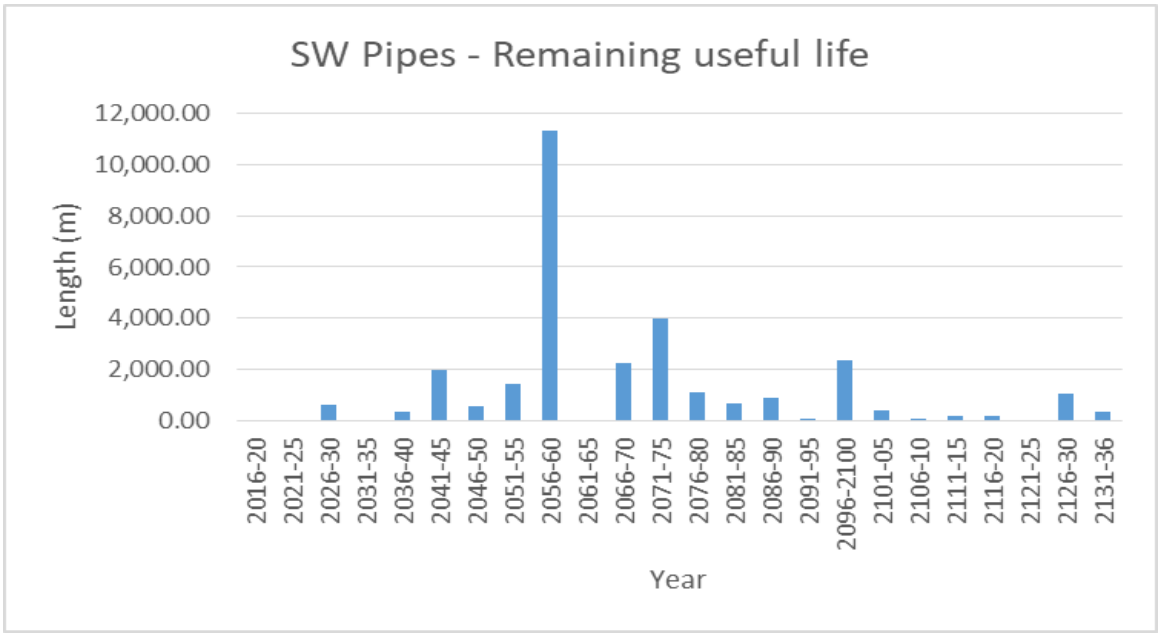


Figure 8.3: SW Remaining useful life

The indicative renewal programme comprises a relatively modest annual budget of $110,000 pa plus an annual budget for "minor" renewals of $54,000 pa. as illustrated below:

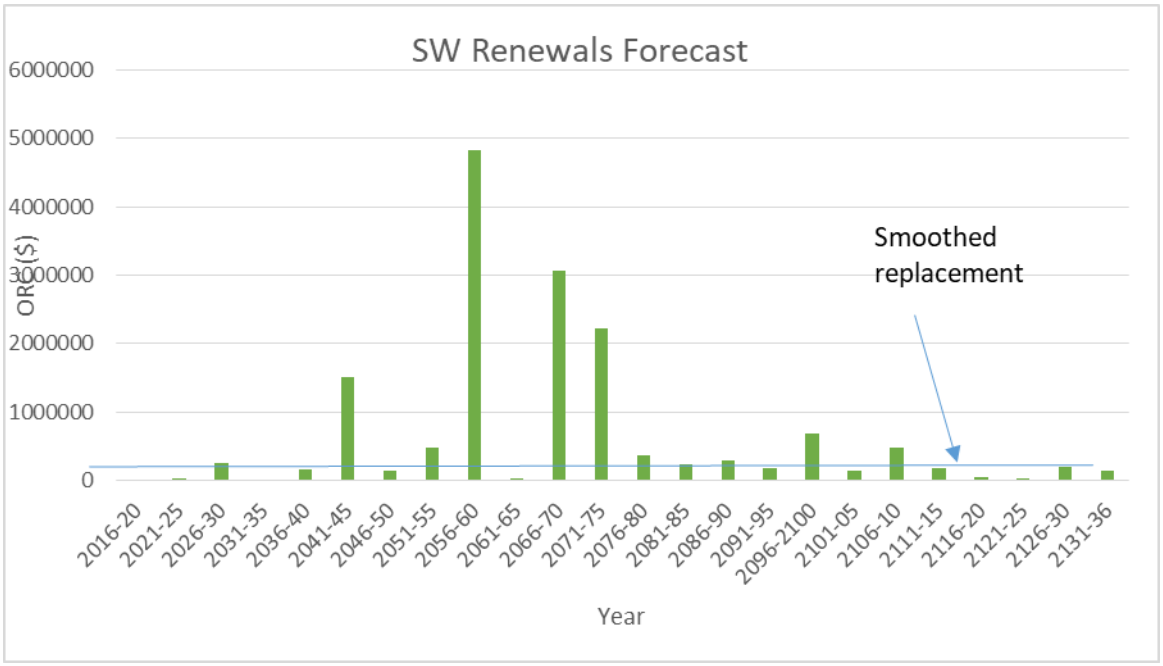


Figure 8.4: SW renewals strategy

Further work on condition assessment will help prioritise pipes that require early attention within this regime ahead of each annual programme.

8.5.1 Renewal Strategies

The general renewal strategy 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 (blockages, surcharging etc), repeated storm water overflows
  - ineffective storm water treatment

- Economics: Renewals are programmed with the objective of achieving;
  - the lowest life cycle cost for the asset (it is uneconomic to continue repairing the asset), or
  - an affordable medium-long term cash flow, or
  - savings by co-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 cost/ benefit of each project, Council's objectives and strategies, and available funds.

The following priority ranking table is used as a guide for identifying and prioritising renewal works:

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. ▪ Asset performance is non-compliant with resource consent requirements.
2	▪ Asset failure is imminent, but failure is likely to have only a minor impact on the environment, public safety or property. ▪ Asset failure is imminent and proactive renovation is justified economically. ▪ Road 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.
3	▪ Asset failure is imminent, but failure is likely to have a negligible impact on the environment, public safety or property. ▪ Asset renewal is justified on the basis of life cycle costs, but deferment would result in minimal additional cost.
4	▪ Existing assets have a high level of flexibility and efficiency compared with replacement alternative.
5 (Low)	Existing asset materials or types are such that problems are not expected to become an issue on the short to medium term.

Figure 8.5: Selection Criteria for Asset Renewal

The renewal strategy will be reviewed at least annually and any deferred work will be re-prioritised, based on its 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 levelling will be applied to balance income with expenditure through either raising loans, or reducing levels of service or deferring work.

8.5.2 Renewal Standards and Specifications

The standards and specifications for renewal works are generally the same as for new works.

8.5.3 Deferred Renewals

Renewal works identified in terms of the renewal strategies may be deferred if the cost is beyond the community's ability to fund it. This can occur when higher priority works are required on other infrastructure assets (e.g. sewerage), or there are short term peaks in expenditure or if an inadequate rating base exists.

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 the financial reporting.

8.5.4 Funding of Renewal or Replacements

Renewals/replacements are principally funded from depreciation reserves which in turn are 100% funded from targeted uniform annual charges split 85%/15% between rural and urban rating areas.

8.5.5 Mode of Service Delivery

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

8.6 STORMWATER ASSET DEVELOPMENT PROGRAMME

Development works are those works that create a new asset that did not exist or works which upgrade or improve an existing asset beyond its existing design capacity. New assets are acquired as a result of:

- taking over new infrastructure constructed with 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 (e.g. larger storm water drains, etc)
  - new resource consent standards (e.g. treatment facilities)
  - higher levels of service (e.g. piping of open drains in urban areas)

An indicative capital development programme is shown in Appendix D.

The capacity of stormwater drainage pipes, and hence the finite level of service, is determined from design storms comprising rainfall intensity and return period and surface permeability. Council has adopted the Hamilton City Council (HCC) Infrastructure Technical Standards for these parameters, which distinguish between open field and infill development. The latter is more relevant to current circumstances in Waitomo District. Under the HCC standards, the design storm return periods for residential, industrial and commercial zones are 2, 5 and 10 years respectively (i.e. a rain storm that occurs once every two years, etc.). Beyond that, secondary flow paths designed to accommodate a rainstorm having a 50 to 100 year return period, are required to safely manage the ensuing overflow. These can be in the form of open drains through residential property, ponding in public parks or using the road network as temporary flow paths.

Where these overland flow paths do not follow normal demarcated drains they need to be identified, mapped and protected from development, if future flooding is to be prevented.

Catchment management plans that will entail calculation of the design runoff, identification of gaps and capacity limitations of the existing stormwater network at each location, identification and protection of (through the use of easements, district plan rules etc) secondary flow paths and an assessment of the impact of each flow path on the relevant properties is the next important planning activity.

The effects of stormwater discharges on the relevant receiving water also need to be considered. Council already holds a comprehensive discharge consent which is a type of general consent to capture the various and numerous point stormwater discharges. Compliance reporting is relatively modest at this stage yet it is about $30,000 per year. It can be expected to be much more stringent when the consent is renewed in 2024.

Provision for stormwater treatment prior to discharge has been made in anticipation of higher environmental standards arising through the consent renewal process in 2024/25. This work is proposed for the 2029-32 period.

8.6.1 Development Strategies

Urban storm water schemes will be developed to meet community expectations, growth projections over the next 20 years, and technical and environmental standards.

A 10 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 will be 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 are as summarised in the table below. It includes 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 ▪ 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 ▪ Public health considerations represent a high 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 community at large through a process of public consultation or involves work funded by a targeted rate
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 8.6: Selection criteria for new storm water works

- Project approvals will be supported by an economic appraisal using cost/benefit analysis techniques which take 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 recommendation by Council staff. Such assets will be accepted into public ownership by Council when satisfactorily completed in accordance with approvals given. Council will not contribute to the cost of such works unless there are exceptional levels of service or equity issues.

8.6.2 Funding of Additional Capacity

Growth-related work will be funded principally from financial contributions, with Council maximising the use of external subsidies where possible. Other capital works costs will be funded from loan in the first instance, with loan servicing charges rated through targeted uniform annual charges as for other stormwater activities. Refer to Council's Revenue and Financing Policy in its 2018-2028 LTP for further details.

8.6.3 Mode of Service Delivery

Development works involving the construction of new assets will be undertaken by external, arms-length contract, on a case by case basis.

8.7 STORMWATER DISPOSAL PROGRAMME

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 stormwater assets would typically relate to the sale of surplus land and the demolition of obsolete structures.

There are currently no stormwater assets targeted for disposal

8.7.1 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.

SECTION 9 - ASSET MANAGEMENT PRACTICES

This section outlines the decision making systems that WDC currently use to determine long term maintenance, renewal and capital expenditure requirements for stormwater assets under three broad areas of activity:

- ⇨ **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.

9.1 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 on day works by maintenance contractors and monitored by WDC staff.
Safety Management	A formal safety management system is an integral component of effective service delivery across all activities. Since the larger part of utilities are situated in the road reserves the WDC Safety Management System (SMS) adopted by the Council on 31 January 2007 (Resolution No. 01/07) controls much of the safety regulations. Copy of the SMS can be found on the Council's Intranet under the page headed Operations. Further safety guidelines are contained in the directives of the Department of Labour.
Financial Control	The NCS 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.
Procurement	Council's procurement policy for storm water capital works shadows the NZTA Procurement 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. Storm water 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 storm 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. The procurement policy for storm water works is guided by a comprehensive contract management policy posted on the Intranet. 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.

Activity	Strategy
Performance Monitoring	Records are kept of audited activities, forward and completed maintenance programs.
Condition Monitoring	Preventative maintenance inspections are routinely undertaken by Council contractors and staff to monitor the condition of storm water assets. In addition the condition of the pipe networks is measured by CCTV surveys on as required 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	Records are kept of all maintenance and repair works. This data is eventually transferred to the BizeAsset system.
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 practised both formally and informally. Judgments are made based on the knowledge of experienced staff considering local conditions and AS/NZS 4360 guidelines.
Staff Development	Staff are kept abreast of changes in science and technology through a human resources training program. Council is a member of SOLGM, the NZ Water and Wastes Association, IPWEA, NZUAG and other sector groups.

Figure 9.1: Asset Management Processes

9.2 CURRENT ASSET MANAGEMENT DATA

9.2.1 Asset Attributes Moderately complete records of the networks exist; significant service areas are identified and recorded by location and type and spatial attributes. Attribute data for stormwater assets is stored in the inventory database. The information available is known to be incomplete and of variable accuracy. A comprehensive programme to address this has been identified in the LTP for consideration and is steadily being updated to include new information, more accurate information and information from completed projects.

9.2.2 Condition Data

Condition information available on stormwater 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.

9.2.3 Data management system

Council operates a hybrid asset management tool known as AssetFinda (previously branded as'BizeAsset') Asset Management System. 'BizeAsset' was designed for small to medium sized councils to meet the advanced 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. The 'BizeAsset' functionality currently utilised within these modules is asset register, accounting (asset valuation), maintenance history ('maintenance event' not 'maintenance cost') and predictive analysis.

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

SECTION 10 - FINANCIAL SUMMARY

10.1 VALUATION OF STORMWATER ASSETS

Stormwater 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 Waitomo District's urban stormwater 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	100,000	45,000	55,000	5,000
Te Kuiti	Pipes	13,228,677	7,441,248	5,787,429	145,757
	Points	2,234,232	1,440,881	793,351	22,384
	S/T	15,462,909	8,882,129	6,580,780	168,141
Piopio	Pipes	52,917	26,458	26,458	588
	Points	92,798	51,039	41,759	928
	S/T	145,715	77,497	68,217	1,516
Benneydale	Pipes				
	Points	25,777	14,177	11,600	258
	S/T	25,777	14,177	11,600	258
Te Waitere	Pipes	20,027	18,247	1,780	223
	Points	6,204	3,412	2,792	62
	S/T	26,231	21,659	4,572	285
Mokau-Awakino	Pipes	195,847	172,616	23,232	2,119
	Points	17,268	13,638	3,630	173
	S/T	213,115	186,254	26,862	2,292
TOTAL		15,973,747	9,226,716	6,747,031	177,492

Figure 10.1: Stormwater Assets

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 Valuation Certificate and schedule of the effective lives used, in the appendices.

10.2 VALUATION CONFIDENCE RATINGS

The data confidence rating for each of the significant asset components of the stormwater valuation as detailed in AECOM's 2015 valuation report 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 Data 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.

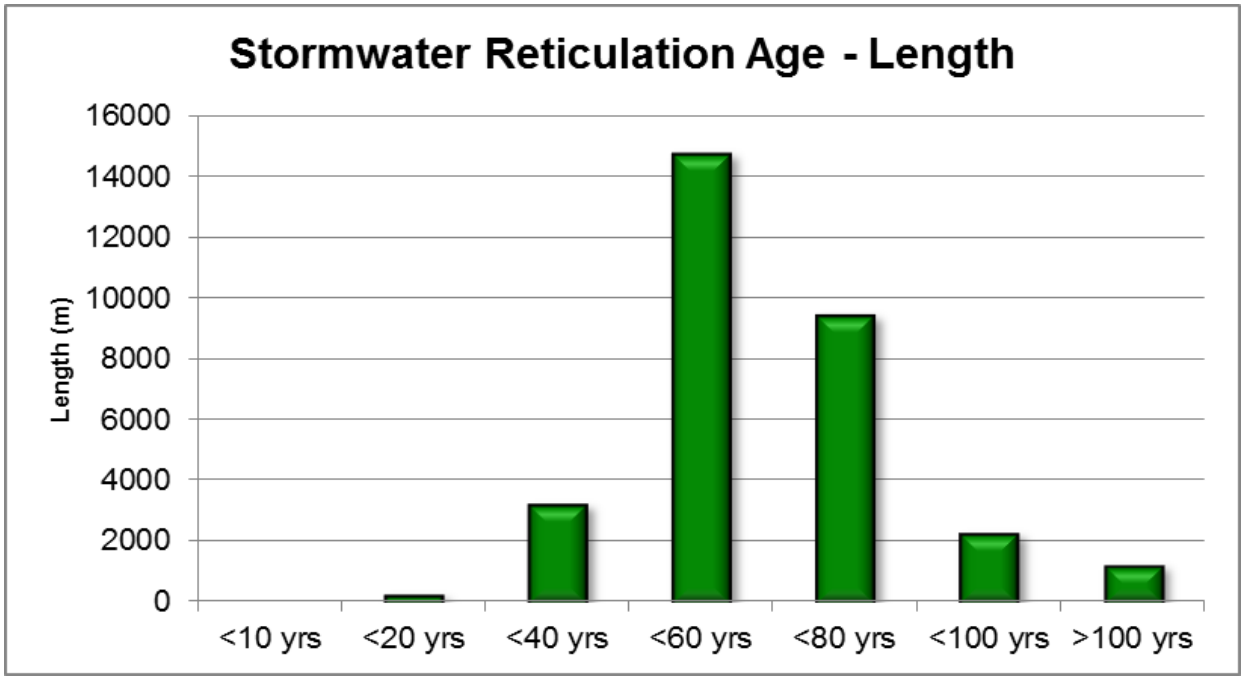
10.4 FINANCIAL PROJECTIONS FOR SW ACTIVITY

The following table shows the financial expenditure forecast for the storm water 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

Stormwater ($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											
Te Kuiti Stormwater	0	0	0	0	0	0	0	0	0	0	0
Rural Stormwater	0	0	0	0	0	0	0	0	0	0	0
	0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Direct Expenditure											
Te Kuiti Stormwater	145,854	133,893	133,117	143,597	139,115	142,673	160,852	150,188	154,282	167,058	162,515
Rural Stormwater	27,560	25,040	25,779	26,493	26,783	27,593	28,690	29,210	30,049	30,842	31,330
	173,414	**158,933**	**158,897**	**170,090**	**165,898**	**170,266**	**189,542**	**179,398**	**184,331**	**197,901**	**193,844**
Indirect Expenditure											
Allocated Costs	56,822	49,827	51,539	52,182	53,384	55,034	57,482	59,423	60,972	61,494	63,043
Depreciation	172,454	180,362	182,851	185,396	187,998	190,660	193,387	197,872	200,736	203,675	206,695
Interest	5,085	3,538	3,059	2,482	1,840	1,220	412	0	0	0	0
	234,361	**233,727**	**237,449**	**240,060**	**243,222**	**246,914**	**251,281**	**257,295**	**261,707**	**265,169**	**269,738**
Net Cost of Service	**407,775**	**392,660**	**396,346**	**410,150**	**409,120**	**417,180**	**440,823**	**436,693**	**446,038**	**463,070**	**463,582**
Capital Expenditure											
Te Kuiti Stormwater	299,149	194,121	198,471	202,876	207,648	212,615	234,855	223,305	229,222	235,527	242,007
Rural Stormwater	5,380	5,000	5,125	5,240	5,365	5,495	5,635	5,775	5,930	6,095	6,265
	304,529	**199,121**	**203,596**	**208,116**	**213,013**	**218,110**	**240,490**	**229,080**	**235,152**	**241,622**	**248,272**
Net Expenditure	**712,304**	**591,782**	**599,942**	**618,266**	**622,133**	**635,290**	**681,313**	**665,773**	**681,190**	**704,692**	**711,854**
Funded By											
Reserves	(303,479)	(186,121)	(187,596)	(199,116)	(197,013)	(202,110)	(238,490)	(217,080)	(223,152)	(236,622)	(236,272)
Internal Loans	0	0	0	0	0	0	0	0	0	0	0
Total Rates	(408,825)	(405,660)	(412,346)	(419,150)	(425,120)	(433,180)	(442,823)	(448,693)	(458,038)	(468,070)	(475,582)
	(712,304)	**(591,782)**	**(599,942)**	**(618,266)**	**(622,133)**	**(635,290)**	**(681,313)**	**(665,773)**	**(681,190)**	**(704,692)**	**(711,854)**

Figure 10.4 Storm water Reticulation Age



- Within the 10 year blocks, and as asset information improves, planned renewals will be individually and specifically assessed against actual asset condition and performance to verify that the renewal is actually needed, before the work is done.
- Where possible, any identified shortfall in capacity will be addressed at the time of pipe replacement so that any existing undersized pipes will be replaced with larger diameter pipes.
- The average planned renewal expenditure based on current asset age and condition information, and actual performance, is approximately $110,000 per annum.
- Minor urban renewals budget of $54,000 pa is provided for unplanned, miscellaneous SW pipe renewals

10.4.1 New Works (Augmentation)

As noted above, completion of urban catchment management plans may identify capacity shortfalls in the existing stormwater network. Similarly, concept design work proposed for Mokau-Awakino and structure planning for Mokau may result in new drainage works proposed for these areas. The capital development programme will be reviewed after these projects have been completed.

10.5 FUNDING SOURCES

Current funding sources available for the urban stormwater activity include:

10.5.1 Rates

Council's LTP includes its revenue and financing policy. In so far as the stormwater activity is concerned, the cost of the collection and disposal of stormwater is funded by way of a targeted uniform annual charge (TUAC), differentiated between the Te Kuiti urban and rural communities and levied on each property in each service area.

10.5.2 Financial/development contributions

Council has two different policy tools available to it that can be used for funding the cost of additional capacity imposed on existing infrastructural assets as a result of growth. The Resource Management Act 1991 sets out the process for Council to charge developers financial contributions

while the LGA 2002 prescribes the process for Council to adopt a development contributions policy. One or other can be used as a source of funding on a single activity, but not both.

Financial contributions can be applied as a condition of consent on a consent by consent basis, corresponding to work required to mitigate an adverse effect of a subdivision on existing infrastructure. Equally, developers can appeal financial contributions set as a condition of subdivision approval. Council's existing District Plan enables financial contributions to be charged where necessary, but so far has not been applied. Council's existing stance in relation to the financial contributions policy is to not charge them. This approach seems to reflect an informal policy of trying to encourage economic development.

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

	No.	Assumption	Level of Uncertainty	Impact on Integrity of LTP
	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.

The assumptions above 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

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 Stormwater AM Plan. 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. The details of these requirements have been included in the relevant budgets of the LTP.

Ref	Description	1	2	3	4	Target Completion Date	Additional Resources Required	Actual Completion Date	Comment
1	Consultation to ascertain the community's service needs and preferences and to ensure their views are considered when selecting the best level of service scenario.	x				Next review 2020	Survey consultant	Continuous	Levels of service survey for SW last completed in 2012
2	Ensure the right level of funding is allocated to maintain the asset service potential.		x			August 2020	Water Services Manager		Pre-LTP
4	Formalise, monitor and record asset inspection and data collection.			x			Water Services Manager & GIS person		On going
5	Improve service provider maintenance reporting and integrate costing information with spatial data in Bizze@sset				x		Water Services Manager & GIS person		
6	Develop accurate and complete asset inventory registers for each urban drainage area.		x				Water Services Manager & GIS person		
7	Initiate a long term condition and performance assessment program, initially for Te Kuiti.	x					Water Services Manager & GIS person		

Ref	Description	1	2	3	4	Target Completion Date	Additional Resources Required	Actual Completion Date	Comment
8	Initiate a SW scheme concept for Mokau-Awakino and Te Waitere				x	December 2025	Water Services Manager		
10	Develop a greater focus on risk identification and management, obtaining more detailed information on critical assets.				x		Water Services Manager & GIS person		
11	Cost and prioritise the works developed from the risk assessment exercise.			x			Water Services Manager & GIS person		
12	Develop strategies to meet the community's desire for higher environmental standards and anticipated more stringent Resource Consent requirements.				x		Water Services Manager		
13	Improve the definition of standards for maintenance			x			Water Services Manager		Using Hamilton City Engineering Standards
14	Complete environmental impact studies for each stormwater drain and receiving water		x			2021 - 23	Consultant		
15	Review design standards for stormwater pipe sizing based on effects of climate change on rain storm intensity and frequency		x			Catchment Management Plans to be completed	Water Services Manager		WDC uses Hamilton City Standards

Ref	Description	1	2	3	4	Target Completion Date	Additional Resources Required	Actual Completion Date	Comment
16	Prepare Catchment Management Plans for each urban drainage area including calculation of design runoff, identification of gaps and capacity limitations of the existing storm water network at each location, identification and protection of (through the use of easements, district plan rules etc) secondary flow paths and an assessment of the impact of each flow path on the relevant properties.	x				2021-23	Consultant & GIS person		
17	Undertake a new assessment of water and sanitary services available to communities in the district			x		2020/21	External advice		Assessment in accordance with s.125 of the LGA 2002. The most recent assessment was completed in 2014.

Ref	Description	1	2	3	4	Target Completion Date	Additional Resources Required	Actual Completion Date	Comment
18	Arrange regular forum of adjacent councils storm water officers to discuss best practice trends, concerns, future developments, that may affect neighbouring authorities, cost sharing on consultants or specialist providers (e.g. spare survey or design capacity in larger councils shared by others).				x				Ongoing

Key – Relative Priority:

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 Storm water Activity Management Plan:

- 2007 Waikato Regional Council Regional Plan (Water Module)

SECTION 14 - APPENDICES

Appendix	**Title**
A	Glossary
B	Extract from LGA 2002 – s.101B Infrastructure Strategy
C	SW Expenditure Program 2018 – 2048
D	Effective Lives of Storm water Assets

APPENDIX A: GLOSSARY

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

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

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

	requirements, in accordance with maintenance quality objectives.
Net present value (NPV)	The value of an asset to the organisation, derived from the continued use and subsequent disposal in present monetary values. It is the net amount of discounted total cash inflows arising from the continued use and subsequent disposal of the asset after deducting the value of the discounted total cash outflows.
NIMT	North Island Main Trunk rail line
Objective	An objective is a general statement of intention relating to a specific output or activity. They are longer term aims and are not necessarily outcomes that managers can control.
Operation	The active process of utilising an asset which will consume resources such as manpower, energy, chemicals and materials. Operation costs are part of an assets life cycle costs..
Optimised renewal decision making (ORDM)	An optimisation process for considering and prioritising all options to rectify performance failures of assets. The process encompasses NPV analysis and risk assessment.
Performance indicator (PI)	A qualitative or quantitative measure of a service or activity used to compare actual performance against a standard or other target. Performance indicators commonly relate to statutory limits, safety, responsiveness, cost, comfort, asset performance, reliability, efficiency, environmental protection and customer satisfaction.
Performance monitoring	Continuous or periodic quantitative and qualitative assessments of the actual performance compared with specific objectives, targets or standards.
Planned maintenance	Planned maintenance activities fall into 3 categories :
	(a) Periodic - necessary to ensure the reliability or sustain the design life of an asset.
	(b) Predictive – condition monitoring activities used to predict failure.
	(c) Preventive - maintenance that can be initiated without routine or continuous checking (e.g. using information contained in maintenance manuals or manufacturers' recommendations) and is not condition-based.
Rehabilitation	Works to rebuild or replace parts or components of an asset, to restore it to a required functional condition and extend its life, which may incorporate some modification. Generally involves repairing the asset using available techniques and standards to deliver its original level of service (i.e. heavy patching of roads, slip-lining of stormwater mains, etc.) without resorting to significant upgrading or replacement.
Renewal	Works to upgrade, refurbish, rehabilitate or replace existing facilities with facilities of equivalent capacity or performance capability.
Repair	Action to restore an item to its previous condition after failure or damage.
Replacement	The complete replacement of an asset that has reached the end of its life, so as to provide a similar or agreed alternative, level of service.
Remaining economic life	The time remaining until an asset ceases to provide service level or economic usefulness.
Risk cost	The assessed annual cost or benefit relating to the consequence of an event. Risk cost equals the costs relating to the event multiplied by the probability of the event occurring.
Risk management	The application of a formal process to the range of possible values relating to key factors associated with a risk in order to determine the resultant ranges of outcomes and their probability of occurrence.
Routine maintenance	Day to day operational activities to keep the asset operating (replacement of light bulbs, cleaning of drains, repairing leaks, etc.) and which form part of the annual operating budget, including preventative maintenance.
Service potential	The total future service capacity of an asset. It is normally determined by reference to the operating capacity and economic life of an asset.
Strategic plan	Strategic planning involves making decisions about the long term goals and strategies of an organisation. Strategic plans have a strong external

	focus, cover major portions of the organization and identify major targets, actions and resource allocations relating to the long term survival, value and growth of the organisation.
Unplanned maintenance	Corrective work required in the short term to restore an asset to working condition so it can continue to deliver the required service or to maintain its level of security and integrity.
Traffic volume	The number of vehicles flowing in both directions past a particular part in a given time (for example, vehicles per hour or vehicles per day).
Upgrading	The replacement of an asset or addition/ replacement of an asset component which materially improves the original service potential of the asset.
Valuation	Estimated asset value which may depend on the purpose for which the valuation is required, i.e. replacement value for determining maintenance 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.

APPENDIX C: STORMWATER EXPENDITURE FORECAST 2018 - 28

Stormwater ($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											
Te Kuiti Stormwater	0	0	0	0	0	0	0	0	0	0	0
Rural Stormwater	0	0	0	0	0	0	0	0	0	0	0
	0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Direct Expenditure											
Te Kuiti Stormwater	145,854	133,893	133,117	143,597	139,115	142,673	160,852	150,188	154,282	167,058	162,515
Rural Stormwater	27,560	25,040	25,779	26,493	26,783	27,593	28,690	29,210	30,049	30,842	31,330
	173,414	**158,933**	**158,897**	**170,090**	**165,898**	**170,266**	**189,542**	**179,398**	**184,331**	**197,901**	**193,844**
Indirect Expenditure											
Allocated Costs	56,822	49,827	51,539	52,182	53,384	55,034	57,482	59,423	60,972	61,494	63,043
Depreciation	172,454	180,362	182,851	185,396	187,998	190,660	193,387	197,872	200,736	203,675	206,695
Interest	5,085	3,538	3,059	2,482	1,840	1,220	412	0	0	0	0
	234,361	**233,727**	**237,449**	**240,060**	**243,222**	**246,914**	**251,281**	**257,295**	**261,707**	**265,169**	**269,738**
Net Cost of Service	**407,775**	**392,660**	**396,346**	**410,150**	**409,120**	**417,180**	**440,823**	**436,693**	**446,038**	**463,070**	**463,582**
Capital Expenditure											
Te Kuiti Stormwater	299,149	194,121	198,471	202,876	207,648	212,615	234,855	223,305	229,222	235,527	242,007
Rural Stormwater	5,380	5,000	5,125	5,240	5,365	5,495	5,635	5,775	5,930	6,095	6,265
	304,529	**199,121**	**203,596**	**208,116**	**213,013**	**218,110**	**240,490**	**229,080**	**235,152**	**241,622**	**248,272**
Net Expenditure	**712,304**	**591,782**	**599,942**	**618,266**	**622,133**	**635,290**	**681,313**	**665,773**	**681,190**	**704,692**	**711,854**
Funded By											
Reserves	(303,479)	(186,121)	(187,596)	(199,116)	(197,013)	(202,110)	(238,490)	(217,080)	(223,152)	(236,622)	(236,272)
Internal Loans	0	0	0	0	0	0	0	0	0	0	0
Total Rates	(408,825)	(405,660)	(412,346)	(419,150)	(425,120)	(433,180)	(442,823)	(448,693)	(458,038)	(468,070)	(475,582)
	(712,304)	**(591,782)**	**(599,942)**	**(618,266)**	**(622,133)**	**(635,290)**	**(681,313)**	**(665,773)**	**(681,190)**	**(704,692)**	**(711,854)**

APPENDIX D: EFFECTIVE LIVES OF STORMWATER ASSETS

Reticulation Material	Base Life Yrs	NZ-Guidelines
Unknown	80	60-150
CONC	90	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	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