ASSET MANAGEMENT PLAN

WASTEWATER

2021




GREAT LAKE TAUPŌ
Taupō District Council

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AMP Summary – Wastewater

Introduction

Taupō District Council provides wastewater services for 11 towns and communities in the district. This Wastewater Asset Management Plan enables Council to manage and demonstrate its stewardship of wastewater assets on behalf of its communities in order to provide those services cost-effectively, both now and into the future.

Strategic Issues

Council operates within the context of these strategic issues:

- Protecting public health – the primary purpose of Council owned wastewater systems is to protect the health of communities.
- Protecting our waterways from nitrogen flows and untreated wastewater. As part of the Lake Taupo Protection project Council is responsible for reducing its nitrogen discharge into the Lake Taupo catchment by at least 20% by 2020, which has been achieved, and is required to maintain this level of reduction into the future.
- Three Waters Reform: Possible amalgamation of the delivery of the three waters services into larger regional entities.

Wastewater Assets

Council's wastewater schemes include physical assets with a replacement value of $220 million (August 2020).

Council holds resources consents from Waikato Regional Council for discharge of treated wastewater, biosolids and control odour.

The schemes vary widely in size and age, and therefore in the technology they use. A list of the schemes is given below with a map showing their location on the following page.

Taupo District Wastewater Schemes

Scheme	No. of Rateable Properties
Acacia Bay	735
Atiamuri	34
Kinloch	1,068
Mangakino	716
Motuoapa	473
Omori	1,164
Taupo	12,092
Turangi	2,213
Whakamaru	60
Whareroa	164
Grand Total	**18,719**

Levels of Service

A key objective of this Asset Management Plan is to match the level of service provided by the asset with the expectations of customers. This requires a clear understanding of customers' needs, expectations and preferences.

The levels of service define relate to:

- Sufficient capacity to meet the demands of today and future growth
- We manage the environmental impacts of our wastewater treatment and discharges (compliance with resource consents)
- Quality of effluent discharge from Treatment facilities is acceptable (nitrogen discharges are managed)
- Sewerage systems are maintained to an adequate standard to minimise overflows and minimise harm to the community (including fault response times).
- The number of complaints received by Council relating to the wastewater service.

State of the Assets

Taupō Township

The Taupo township is growing and now requires capital expenditure on reticulation, treatment plants and disposal systems. Changes to related to resource consents are also a driving the need to improve infrastructure. This specifically relates to Rakaunui Road land disposal system where consented nitrogen loading rates are significantly reducing and effluent disinfection may be required.

There remains some uncertainty in the work programme presented for the Taupo WWTP and the scope of the works required will continue to be developed over the

Turangi

Council commissioned a substantial new wastewater treatment plant in Turangi in 2006. That system enabled Council to significantly reduce nitrogen discharges to the lake Taupo catchment. A significant effort has been made to improve the performance of treatment plant and full membrane replacement has occurred over the past few years. The discharge consent expires in 2018 and a new consent was applied for in December 2017. Since this time Council has been working with affected Iwi to consider alternative land disposal options. This remains a work in progress.

Extensive cleaning and condition assessment have been undertaken in the Turangi township. Significant volumes silt and debris have been removed from the network and this will have reduced the risk of overflows in the area. Network condition work is ongoing preliminary results are that the network is in better than expected condition. An inflow and infiltration study is in progress, aiming to identify and reduce sources of stormwater getting into the sewer network.

Mangakino

A significant renewal plan has addressed poor condition pipework in Mangakino, and the reticulation is now in very good condition. The town also appears to be redeveloping and as a result the WWTP will require and upgrade to comply with new resource consent conditions (draft) also aimed at managing nitrogen discharges.

Acacia Bay

The Acacia Bay wastewater treatment plant was granted a new discharge consent in 2016 (a 20-year consent). The major requirement of the consent was to increase the soakage / disposal capacity at the site and this has been completed. The long-term future for Acacia Bay might be to connect to the Taupo network and decommission the plant however there are currently limitations with downstream capacity (control gate bridge siphon).

Kinloch

A new consent for the discharge of effluent from the treatment plant was issued in 2014. The permitted methods of effluent discharges to land include dripper irrigation lines and continued use of the existing trenches. 2021 The Kinloch WWTP will undergo a major treatment plant upgrade. There is also a requirement to improve storm water management to protect the treatment works during high rain fall.

Motuoapa

A new consent for the plant was issued in 2013 which has resulted into more stringent discharge conditions and requiring upgrade to the treatment facility. A minor upgrade was completed in 2016. There appears to be an issue with infiltration into the network when the lake level is high, and this requires further investigation.

Whakamaru

Following a new wastewater discharge consent being granted, a new wastewater treatment plant was commissioned. The new plant reduces the mass of nitrogen being discharged from the site. The reticulation is in good order after some relining work was completed on the poor condition section of the system.

Others highlights

Motutere, Omori and Whareoa have all been granted a new wastewater consent in 2019 and 2020.

The Waitahanui wastewater treatment plant was decommissioned in 2016 with the waste now pumped to Taupo. The WWTP has been removed and the land transferred to the original owners.

Demand forecast

The Council's growth model is due to be updated. Growth appears to have been greater than expected over the recent years and this has put greater pressure on the wastewater assets.

Lifecycle Management

New Works

The significant new capital projects in the 10-year plan (DRAFT) are:

- Kinloch WWTP upgrade
- Taupo wastewater disposal improvements (irrigation expansion, disinfection (provisional) land purchases.
- Turangi wastewater land disposal (provisional on steering group and
- Southern trunk sewer capacity upgrade
- Control gates bridge sewer capacity upgrade
- Mangakino WWTP upgrade.

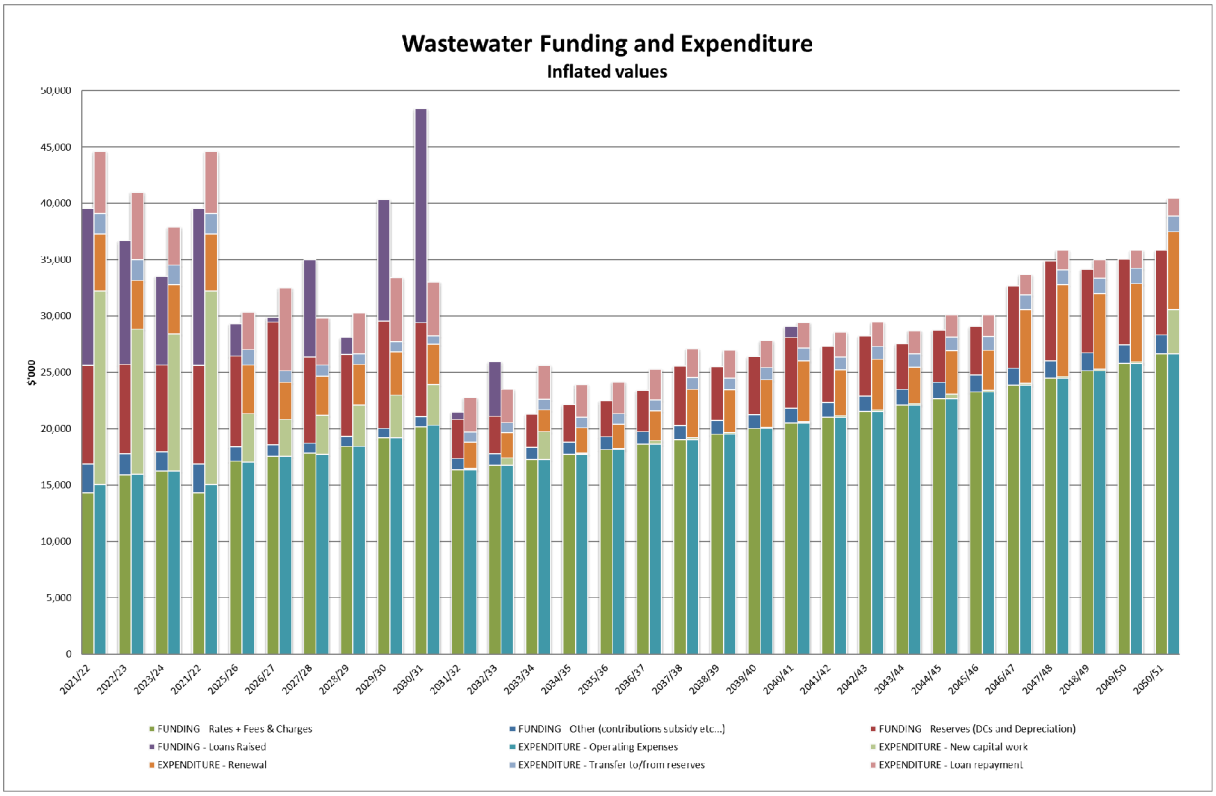
Renewals

Most of the sewer network is not at expected end of life so major expenditure is not planned in the near term. Improvement to wastewater pump station electrical and control system remains a work in progress and is a priority in the near term. Renewal of treatment plant equipment occurs as and when required to maintain effective treatment processes.

Operation and Maintenance

Financials

Draft capital and renewals budgets have been presented above and are an increase over previous expenditure. Operational and maintenance budgets are increased to allow for the operation of these new assets and to maintain levels of service.



Changes though Council and general LTP consultation process

$400,000 has been added to Yr4 to allow reticulation of Motutere Point wastewater and to connect this to the WWTP. The timing of the WWTP upgrade has been modified to align with this project and budget timing is now $100,000 Yr3, $500,000 Yr4 for the WWTP upgrade, and $400,000 Yr4 for reticulation of the point community.

Asset Management Practices

Council uses a range of decision making tools and data and information from a number of sources (technical, financial, customer service) to establish its maintenance, renewal and new works expenditure, including: process, analysis and evaluation techniques for life cycle asset management; information systems to store and manipulate data.

Council utilizes asset management system (Asset Finda) to manage three waters assets. While reticulation networks are now fully managed within Asset Finda treatment plants and pump station are not yet fully loaded in Asset Finda. Not having this data in Asset Finda does limit the opportunity to use analytics to optimize expenditure however this is an area of continued improvement.

1.0 INTRODUCTION

1.1 Background

1.1.1 PURPOSE OF THE PLAN

Taupo District Council is responsible for managing a range of community owned assets including the wastewater reticulation network, treatment plant and disposal systems. This Asset Management Plans helps ensure that these assets are managed in an efficient way.

This Wastewater Asset Management Plan (WWAMP) details how the wastewater infrastructure assets that are owned by the community will be managed in a conscientious manner to cost effectively meet the needs of the community.

Council manages approximately $220 million dollars of wastewater supply infrastructure assets on behalf of the community. These assets are summarized in asset data section. The value of assets is at June 2020.

The size of the wastewater network investment, importance of wastewater services to the community and requirements of legislation, drives a demand for excellence in the management of these assets. The community expects the wastewater network, along with treatment and disposal system, to be managed optimally, to provide secure and safe water, within the agreed levels of service, while minimising costs of the service.

The overall purpose of asset management planning is:
"To meet a required level of service in the most cost-effective way (through the creation, operation, maintenance, renewal and disposal of assets) to provide for existing and future customers".

This asset management plan (AMP) is the tool for combining management, financial, engineering and technical practices to ensure that the level of service required by customers is provided at the lowest long-term cost to the community. The plan is intended to demonstrate that Council is managing the assets responsibly and that customers will be regularly consulted over the price/quality trade-offs resulting from alternative levels of service.

The main benefits derived from asset management 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.

The overall responsibility for water supply asset management and the update of the Asset Management Plan at TDC, sits with the Asset Manager Water (AM). The AM plans and

implements the capital programme as well as renewals programmes across network assets. Lifecycle management plans for each water scheme are updated by the AM for inclusion in the AMP document.

The AM works closely with the Operations Manager 3 Waters (OM) who manages the operation and maintenance of all water assets as well as renewal planning and implementation for water treatment assets.

Senior Leadership and Elected Member (Councillor) involvement is through the review and approval of the AMP document, LTP and annual plan process. All AMPs are formally updated on a 3-yearly basis, which coincides with the LTP review cycle.

This Asset Management Plan has been updated internally by the Asset Manager Wastewater, building on the existing 2018 AMP document. Data has been collated and updated using the AMS and recent asset valuation data. Contributions for this plan have also been made from water team staff, asset managers from other service areas & other engineering officers within the Infrastructure division. Financial updates have been provided by TDCs finance team.

1.1.2 LEGISLATIVE REQUIREMENTS FOR ASSET MANAGEMENT PLANNING

The recent focus on asset management planning, results from the Local Government Amendment Act 2002, November 2013 amendment and subsequent amendments.

This Act places an emphasis on strategic financial planning and requires local authorities to:

- Prepare and adopt a Ten-Year Plan (TYP) with a 10-year planning horizon every three years, taking into account asset creation, realisation, and loss of asset service potential.
- In determining their long-term financial strategy, consider all relevant information and assess the cost/benefit of options.
- Manage assets prudently, in the interests of the district and its inhabitants and ratepayers.
- Clearly identify significant forecasting assumptions and risks underlying financial estimates.
- Identify any significant negative effects that any activity within the group of activities may have on the social, economic, environmental, or cultural well being of the local community.

The preparation and implementation of an AMP from which long-term financial strategies will be developed, is a means of TDC complying with these requirements.

1.1.3 THE HAVELOCK NORTH OUTBREAK, GOVERNMENT 3 WATERS REVIEW AND REFORM

The outbreak of gastroenteritis in Havelock North in August 2016 shook public confidence in the fundamental service provision of safe drinking water. Approximately 5,500 of the town's 14,000 residents were estimated to have become ill with campylobacteriosis. Some 45 were subsequently hospitalised and the outbreak contributed to four deaths. A number of residents continue to suffer health complications.

A Government Inquiry was established to investigate and report on the outbreak. The final reports of the Inquiry contained comprehensive, wide-ranging and powerful recommendations for improvement to water supplies across New Zealand.

The Three Waters Review, a cross-government initiative led by the Minister of Local Government began in mid-2017 and was run in parallel to the Inquiry. The findings of the Review were consistent with many of the Havelock North Inquiry's findings and raised broader questions about the effectiveness of the regulatory regime for the three waters, and the capability and sustainability of water service providers.

The Government announced an opt-in 3-waters reform programme, to address the service delivery and funding findings from the review and inquiry. An initial funding package (Tranche 1) of $761 million was made available to provide immediate post-COVID-19 stimulus to local authorities to maintain and improve three waters infrastructure, support reform of local government water services delivery arrangements.

To receive Tranche 1 funding TDC was required to sign a non-binding MOU to share information and participate in the reform programme that is looking to consolidate the services delivery of the 3-waters into larger and more focused organisations. TDC will receive $8.32M of funding that will be used to deliver 3 waters projects across the District during 2020 and 2021.

An indicative programme for the second and third phases of this programme is included below. Extra stimulus is expected at each stage however to receive the stimulus Councils are expected to have to opt-in to the establishment of a new multi-regional delivery entity, in Tranche 2, and to handover asset ownership and service delivery in Tranche 3. At this stage TDC has made no decision on Tranche 2 or 3.

This reform programme could change the way in which 3-waters services are delivered in the Taupo District.

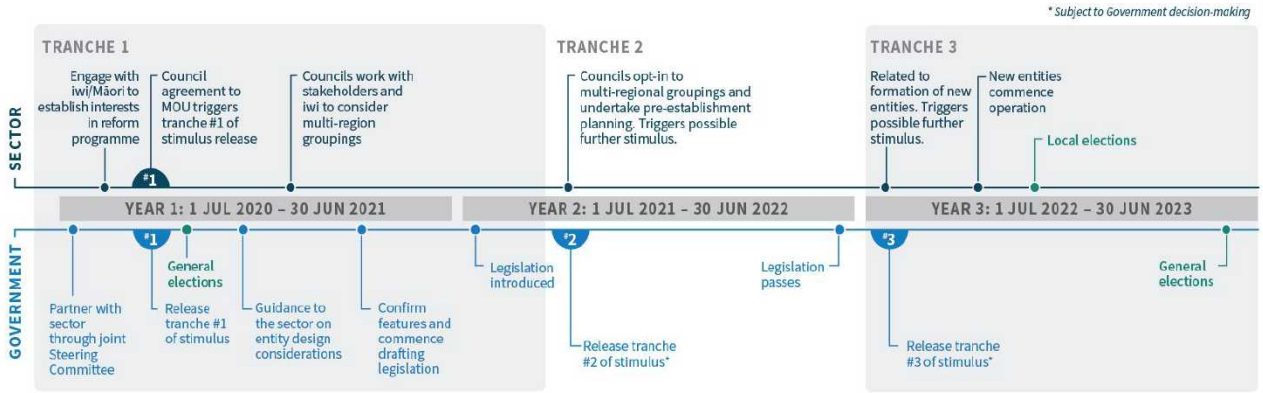


Figure 1: Indicative Government 3 Waters Reform Programme

1.1.4 LEGISLATIVE DOCUMENTS

The key legislative documents relating to the management of wastewater service assets are listed in the following table.

Table 1-1: Relevant Legislation

Local Government Act 2002 and	The LGA empowers local authorities to carry out various wastewater works but does not require them to do so.

Amendments	The Act requires public consultation.
Health Act 1956	Requires Council to: • provide 'sanitary works', the definition of which includes wastewater disposal and includes all lands, buildings, machinery, reservoirs, dams, tanks, pipes and appliances used in connection with any such works. • ensure the provision in any dwelling house of an adequate and convenient method for the disposal of wastewater.
Resource Management Act 1991	Requires Councils to: ▪ sustain the potential of natural and physical resources to meet the reasonable foreseeable needs of future generation ▪ comply with District and Regional Plans ▪ avoid, remedy or mitigate any adverse effect on the environment ▪ 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 resource consents issued by the Waikato Regional Council for disposal of wastewater and land use (designations for activities such as treatment plants).
Other Acts and Regulations	Hazardous Substances and New Organisms Act 1996 Building Act 2004 Public Works Act 1981 Health & Safety in Employment Act 1999 Civil Defence Emergency Act 2002 Public Bodies Contracts Act 1959 TDC Trade Wastewater Disposal Bylaw 2015 WRC Variation 5 Protecting Lake Taupo

1.1.4.1 Water and Sanitary Services Assessment

A Water and Sanitary Services Assessment was updated in 2017.

1.1.4.2 Variation 5 Protecting Lake Taupo

The following tables itemise sections of Environment Waikato's Regional Plan Variation 5 – Lake Taupo Catchment that affect TDC. The complete clauses can be found in the Variation 5 document. A map showing the extent of the Lake Taupo Catchment is shown after the Implementation Methods tables.

Table 1-2: Variation 5 Implementation Methods – Non-Regulatory

Number	Section
3.10.4.2 (page 15)	**Taupo District Council Long-Term Council Community Plan** Waikato Regional Council will advocate for provision for community wastewater upgrades and reticulation in the Taupo District Council Long Term Council Community Plan, particularly the reticulation and centralised treatment of sewage from lakeshore settlements including; • Hatepe • Waitetoko • Oruatua/Tauranga Taupo • Te Rangiita

Number	Section
	• Waihi Village
3.10.4.5 (page 15)	**Research into Development and Implementation of Markets for Nitrogen Offsetting** Waikato Regional Council will, with Central Government, Taupo District Council and affected landowners, support and facilitate research into the practical implementation of markets for nitrogen offsetting between properties in the Lake Taupo catchment. Waikato Regional Council will provide a central notice board to advertise nitrogen for sale/wanted.
3.10.4.6 (page 15)	**Wastewater Management** Develop and implement in conjunction with Taupo District Council a management system for on-site wastewater in the Taupo Catchment that is consistent with Australia/New Zealand Standard 1547:2000.
3.10.4.7 (page 16)	**Integrated Management of Wastewater** Work with Taupo District and other stakeholders to: • Ensure integrated management of on-site wastewater • Ensure domestic wastewater systems chosen for new subdivisions and individual properties represent the Best Practicable Option and include provision for nitrogen reduction. • Advocate for centralised wastewater servicing of new subdivisions where such servicing is practicable. • Ensure major stakeholders, including designers, manufacturers, installers and users of on-site wastewater systems, are provided with information, advise and discussion forums that help them carry out their wastewater management responsibilities appropriately and in line with Australia/New Zealand Standard 1547:2000 • Promote practices to ensure non-domestic point source discharges, such as stormwater and industrial discharges do not adversely affect Lake water quality. • Support joint initiatives with the Bay of Plenty Regional Council and Rotorua District Council for testing treatment efficiencies of advanced wastewater treatment systems.
3.10.4.8 (page 16)	**Public Fund** Waikato Regional Council will, in conjunction with Ngati Tuwharetoa and funding partners Taupo District Council and Central Government continue to be a member of a Joint Committee of a charitable trust call the Lake Taupo Protection Trust, which is a Council Controlled Organisation that: • Comprises a board of technical people as Trustees appointed by the Joint Committee. • Implements strategies to permanently reduce nitrogen from rural land use activities by 20 percent. • Contracts appropriately skilled persons to provide advice and nutrient modelling support and education in the nitrogen benchmarking process, as the first phase of achieving a nitrogen cap for farming land uses.
3.10.4.9 (page 16)	**Review of Effectiveness of Public Fund** Waikato Regional Council will, in conjunction with other members of the Joint Committee, Ngati Tuwharetoa, Taupo District Council and Central Government, initiate a review after 2010 of the Council Controlled Organisation's effectiveness toward achieving the nitrogen reduction target

Number	Section
	using public funding.
3.10.4.11 (page 17)	**Landowner Involvement in Catchment Management** Establish a catchment management body that is supported and represented by regulatory authorities, Ngati Tuwharetoa and private owners of pastoral, forestry and undeveloped rural land, that has a formal reporting and advisory role to Waikato Regional Council on matters related to the transition to sustainable rural land uses in the Lake Taupo Catchment, including: • Research Needs • Extension and advice • Monitoring and auditing processes for rural land used consents.
3.10.4.12 (page 17)	**Advocacy and Joint Approaches** Waikato Regional Council will, through advocacy and joint approaches with Taupo District Council, proactively seek to prevent adverse effects on the environment and the wider economic, social and cultural values and address resource management issues that arise as a consequence of land use changes.

Table 1-3: Variation 5 Implementation Methods – Land Use Controls

Number	Section
3.10.5 (pages 19-27)	**Rules regarding farm/rural discharges**
3.10.6.1 (page 28)	**Permitted Activity Rule - Discharge of Domestic Wastewater from Existing On-site Systems within the Near-shore Zone** The discharge of domestic wastewater effluent (including grey water but not stormwater) onto or into land from an on-site domestic wastewater treatment and land application system in the Lake Taupo Near-shore Zone lawfully established or authorised before the date of notification of this rule is a permitted activity until 30th June 2013, subject to the following conditions: *The owner of the wastewater system shall obtain and supply to the Taupo District Council, at intervals not exceeding 3 years, a report from a Waikato Regional Council approved inspector, certifying that the wastewater treatment and disposal system is fit for purpose, and complies with the conditions of this rule. The report shall also include any recommended maintenance or repairs required. Such maintenance/repairs shall be carried out within 3 months of the date of the report. The first inspection is required by 9 July 2008.*
3.10.6.2 (page 29)	Permitted Activity Rule – Discharge of Domestic Wastewater from Existing On-site Systems Outside the Near-shore Zone
3.10.6.3 (page 30)	Permitted Activity Rule – New Nitrogen Removing On-site Wastewater Systems
3.10.6.4 (page 32)	Permitted Activity Rule – New Conventional On-site Wastewater Systems
3.10.6.5 (page 33)	Controlled Activity Rule - Wastewater Systems in the Near Shore Zone after 30th June 2013

Number	Section
3.10.6.6 (page 34)	Restricted Discretionary Activity Rule – New Papakainga and Marae Wastewater Discharges

Figure 1-2: Lake Taupo Catchment

1.1.5 RELATIONSHIP WITH PLANNING AND STRATEGIC DOCUMENTS

The way in which Asset Management planning links the strategic planning process with operations and annual plans is illustrated below.

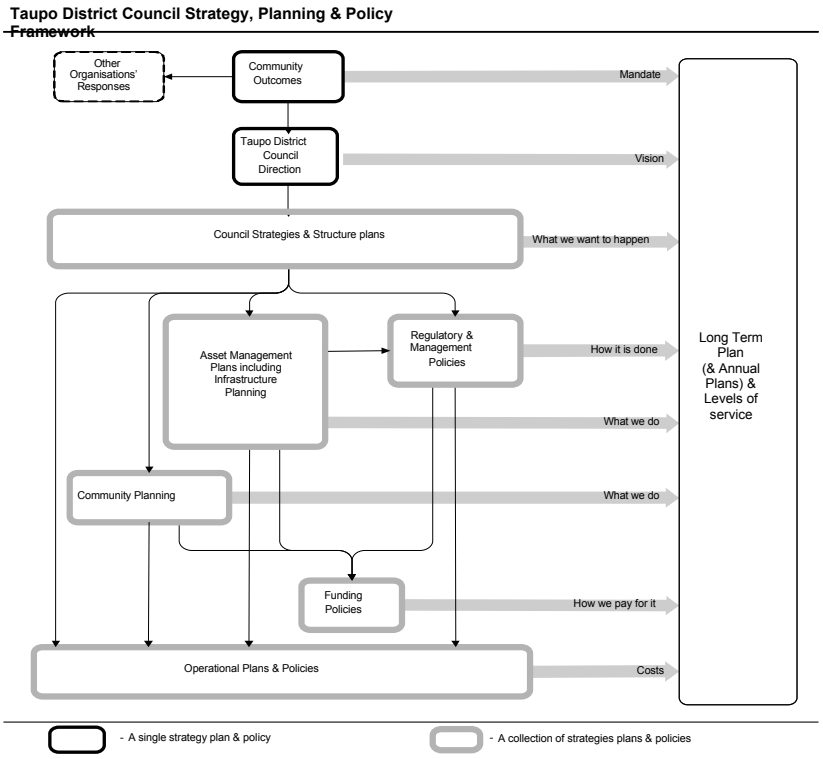


Figure 1-3: Council Planning

AMP's are tactical plans for achieving strategies resulting from the strategic planning process. AMP's are a key component of the council planning process linking with the following documents.

TYP: TYP sets the strategic direction for the Council and is the overarching planning tool which describes the activities the Council will undertake to deliver. It identifies the outcomes the community would like to achieve. It also contains the financial forecast for the next 10 years. This financial forecast is drawn from the AMP.

Annual Plan: This is prepared for year two and three of the TYP period and sets out how Council will undertake its strategic goals and details the specific activities and functions. The works identified in the AMP should automatically become the basis on which future TYP's and annual plans are prepared.

District Plan: The District plan is an implementation tool used to protect values and outcomes important to the community.

Business/Activity Plans: The service levels policies, processes and budgets defined in AMPs are incorporated into business plans as activity budgets, management strategies and performance measures.
Contracts: The service levels, strategies and information requirements contained in AMPs are translated into contract specifications and reporting requirements.

Legislation: The AMP must comply with all relevant legislation and provide the means of meeting legislative requirements.

Bylaws, standards and policies: These tools for asset creation and subsequent management are needed to support AM tactics.

Waikato Regional Plan: This reference gives the policy framework and give effect to the preferred strategic direction for Wastewater disposal from Waikato Regional Council.

Growth Management Strategy TD2050: At the core of Taupo District 2050 is Council Vision and Core Values. These provide the framework of interrelated policies that guide decision making and growth-related issues. The growth model was updated in 2017 and this provides the direction for infrastructure investment.

Structure Plans: Adopted and proposed structure plans outline how growth is to be managed within areas - Taupo Urban Structure Plan (TUSP), Taupo Town Centre Structure Plan (TTCSP), Kinloch Community Structure Plan (KCSP), Mapara Valley Structure Plan, and Southern Structure Plan (SSP).

1.2 Key Stakeholders

This AMP recognises the following as key stakeholders:

Table 1-4: Key Stakeholders

External	Internal
• The community, including citizens, ratepayers and Iwi • Residential, commercial and industrial wastewater service users • Septage collection contractors • Waikato Regional Council • District Health Board (Health Protection Officer) • Government agencies (e.g. Ministry for the Environment, Audit NZ, Department of Conservation) • Tangata Whenua, Tuwharetoa Maori Trust Board, Taupo Nui-a-Tia Management Board • Lakes and Waterways Group	• Councillors and community boards • Senior leadership Group • Asset Management staff • Maintenance contractors • Treatment plant Operations staff • Development Engineer • Finance Manager & team • Information Technology Manager • Strategic Relationships Manager • Corporate Communication Manager • Internal auditor • Council consultants

1.3 Purpose of Ownership

One of the biggest contributors to sustainable environment is having a safe reliable wastewater service. Wastewater collection, treatment and disposal is a core council service, and TDC has historically developed and taken ownership of wastewater service assets to principally meet the public health outcomes as well the protection of the environment desired by the community. More details of the historical ownership of wastewater service assets are included in the life cycle section of this WWAMP.

The wastewater service assets are owned by the community they serve. As discussed previously, the 3-waters services government review that is underway could impact on the delivery of this service in the future.

1.3.1 TDC ORGANISATIONS VISION, MISSION, OBJECTIVES, GOALS

Taupo District 2050 District Growth Management Strategy
TD2050 provides a policy framework to guide where and how future growth should occur and identifies a series of actions to achieve this desired pattern of urban growth.

At the core of TD2050 are Council's vision and core values, Council vision and core values.

> *"TD2050 will help contribute to the overarching Council Vision to be: The most prosperous and liveable district in the North Island by 2022".*

Council's Vision and Values have been translated into seven strategic directions related to the ongoing management of growth:

1. *Plan for a district characterised by contained urban communities, bordered by a productive, functional rural environment*
2. *Design and plan compact, walkable and adaptable urban areas*
3. *Create vibrant, diverse places and spaces where people love to live, work, play and invest.*
4. *Recognise tangata whenua cultural identity and build strong, collaborative relationships*
5. *Provide the platform for a sustainable economy*
6. *Integrate sustainable infrastructure provision, land use and funding.*
7. *Manage development to enhance and protect the natural environment*

These provide the framework of interrelated policies that guide decision making on growth related issues.

Census data has shown that Taupo's population has grown by 13% between the 2013 and 2018 census. This is much greater growth than was expected over this period. Taupo's population is likely to continue to grow and put greater needs of TDCs three waters assets.

1.3.2 ASSET MANAGEMENT'S CONTRIBUTION TO CORPORATE OBJECTIVES

Council's responsibility, as set out in the TYP relating to the wastewater asset is:

Council is responsible through this activity for the collection, treatment and disposal of wastewater from residential, commercial and industrial properties within designated drainage areas of the District in a way which safeguards the environment and provides public health protection.

1.4 Assumptions

1.4.1 FINANCIAL

The following financial assumptions have been made. Further information can be found in the TYP document.

#	Assumptions	Potential risk	Mitigation measure
1.	Asset valuations as at August 2017 have been used as the basis for asset values.	Time between AMP completion and last revaluation	Council undertakes an annual price variance assumption report
2.	Investment Returns eventuate as predicted.	Not the required funds to undertake capital works	Councils LTP and annual plan spend is can be adjusted annually to meet Councils revenue and finance policy
3.	Interest Rate on borrowings remains as predicted within the financial model.	Not the required funds to undertake capital works	Councils LTP and annual plan spend can be adjusted annually to meet Councils revenue and finance policy
4.	Expenditure of capital projects occurs, and estimated debt levels are as predicted	Potential under performance in capital spend reflected in Council revenue	Councils LTP and annual plan spend can be adjusted annually to meet Councils revenue and finance policy
5.	No allowance has been made for inflation adjustment within this AMP (unless specifically stated). The source of funds for the future replacement of significant assets is stated in the revenue and financing Policy.	Under funding of cost centre	Finance team make allowances for GST and inflation in funding plan and policy

#	Assumptions	Potential risk	Mitigation measure
6.	The useful lives of significant assets are as per the accounting policies documented in the TYP. Depreciation is charged at 50% for the first year and 100% in subsequent years.	Asset lives have been incorrectly calculated meaning a funding shortfall	Council has asset depreciation checked externally. Asset lives are compared to the latest asset information nationally
7.	Levels of service and funding has been based on historic data	The community desires changes to level of service which are not reflected in this document.	Council undertakes three yearly satisfaction surveys. Council undertakes pre LTP consolation to gauge the community for different service level needs. Council undertakes consultation with the community as part of the development of this LTP document
8.	Allowance has been made for vested assets	The level of allowance for vested assets is incorrect.	Councils LTP and annual plan spend can be adjusted annually to meet Councils revenue and finance policy
9.	Assume that the revenue received from Rates is as per expected.	A shortfall in rates funding	Councils LTP and annual plan spend can be adjusted annually to meet Councils revenue and finance policy
10.	Assume no costs associated with infrastructures on the lakebed	An increase in unbudgeted operational cost	Councils LTP and annual plan spend can be adjusted annually to meet Councils revenue and finance policy.
11.	Development Contributions will continue to be collected.		

1.4.2 NON-FINANCIAL

#	Assumption	Potential risk	Mitigation measure
1	Assume that growth is going to occur (creation of dwellings) as per the Growth Model predictions.	Changes in growth will impact capital and operational spending	Councils LTP and annual plan spend can be adjusted annually to meet Councils revenue and finance policy
2	The Wastewater discharge quality requirements will remain within the framework of the discharge consent	Changes to discharge quality through the resource consent will require an increase in operational and capital	Councils LTP and annual plan spend can be adjusted annually to meet Councils revenue and finance policy

#	Assumption	Potential risk	Mitigation measure
	conditions.	expenditure	
3	Contractors will be available for the development and construction of projects.	A shortage on contractors for project completion will mean an increase in project cost	Council can extend tender periods to enable contractors more time to schedule in works.
4	There will be continued growth in public participation in the democratic process and Council will need to respond to this growth.	Increased growth in participation could result in changes in levels of service delivery.	Councils LTP and annual plan spend can be adjusted annually to meet Councils revenue and finance policy
5	There will be no unforeseen legislative changes or central government policy changes that will affect this asset.	Changes in legislation could impact on the funding levels	Changes in legislation have an implementation period to enable Councils to plan
6	Economic and labour market constraints may have a direct effect on recruitment.	If Council is unable to recruit to the required level to complete the works program for the year this could have impact on Councils credibility	Council may have to hire consultants to provide support; this could increase the cost of service delivery which will need to be funded through the annual plan process.
7	That Councils resource consents for its activities will be renewed as required.	The renewal of resource consents will depend on Councils prior performance in meeting the conditions of the existing consent and any changes in legislation	Council works closely with the Regional council to achieve consent compliance. Compliance is also a staff performance criterion, so Council is focused on consent compliance and it is considered that any consent related issues can be resolved.
8	Each of the members of the Joint Management Group will fund and implement their respective actions as outlined in the "2020 Taupo-Nui-a-Tia Action Plan".		
9	Changing land uses from high nitrogen uses, such as dairying and pastoral farming, to low nitrogen uses will reduce nitrogen		

#	Assumption	Potential risk	Mitigation measure
	levels in the lake.		

1.5 Significant Negative Effects to Providing the Wastewater Service

In general, providing wastewater services to the community has both public health and environmental benefits.

There are however negative effects in providing this service, these include;

- The risk of overflows due to the concentration of the wastewater within the reticulation system.
- The cost of providing the service on rate payers, especially smaller communities.
- The cost of keeping up with ever increasing environmental standards, regulations (variation 5) requiring significant capital investment and increased operating cost.

To mitigate significant negative effects council has undertaken proactive planning approach to carry out optimisation and modelling studies, conditions assessment of above ground asset and for underground asset, physical inspection of manholes, CCTV and smoke testing for inflow and infiltration issues. For new subdivision the cost of providing new wastewater pump stations, sewer network and its modelling is on the whole funded by new developers as per council's code of practice and is regulated by Development Engineer. The overall maintenance requirements are funded by general rates thus the cost is spread across the community.

1.6 Asset Management Plan Complexity

1.6.1 OUTLINE OF APPROACH

Basic asset management functions are those which produce an AMP based on providing current levels of service and meet minimum legislative requirements by supporting a long term (10 year plus) cash flow forecast and accounting for changes in the service potential of assets. Basic AMPs define existing levels of service and identify costs based on renewal accounting principles.

Advanced AMP's identify processes to optimise lifecycle AM strategies and provide a greater degree of confidence in the resulting cash flow predictions. Advanced AM functions include predictive modelling, risk management, optimised renewal decision making (ORDM) and service level reviews.

The Wastewater Asset Management Plan 2021 follows the IIMM framework and it has been developed and collated internally by the Infrastructure team. This asset management plan is considered to reflect an "Intermediate" level of development.

1.6.2 AMP REVIEW BY COUNCIL

The involvement by councillors, including the reviewing and approving of the AMPs is briefly outlined below:

Workshops are held with the council for group of activities including AMPs which gives them following information:

- What we do:
- Key issues
- The service(s) we provide
- Levels of service, performance measures and targets
- Key projects over the next three years
- Who pays?
- Fees and charges
- Financials
    - Capital expenditure (including renewals)
    - Operating expenditure

Draft AMPs are provided to councillors to view before adoption.

1.6.3 LIMITATIONS OF THIS AMP

As it currently stands, this AM Plan has limitations in the following areas:

- Not all assets are included in Asset Finda,
- Asset condition and performance assessment need to be verified through
- A Levels of Service requires detailed consultation to make the information more current.
- investigations and the renewal programme modelled using condition rating data.
- Growth projections appear to be low and this will need to be updated in the future.

1.7 Organisational Structure

Taupo District Council has a flat organisational structure and is structured in order to deliver the key strategic directions of the Ten-Year Plan.

The wastewater services in the District are managed as follows:

- The Infrastructure Manager has overall responsibility of the Three Water's and Roading Asset Management in the District and reports to the Group Manager Operational Services.

- The Asset Manager is responsible for the technical support, strategic planning, asset management, policy planning, gaining of resource consents, consultation with stakeholders, development and delivery (procurement) of the capital works programme, review and improvement planning for meeting the compliance with legislation.

- The Manager-Water and Wastewater Treatment has responsibility for operation and maintenance of treatment plants and disposal of treated effluents in the district as per consent requirements.

- The Network Engineer(s) are responsible for the monitoring of maintenance contractor(s) and responding to service requests and maintenance queries. Responsibility extends from the sewer connection point (council owned asset) to the treatment plant inlet.

- Development Engineer manages approval process for all connections to the Three Water's asset network and ensures all vested asset including pump station conforms to TDC's Code of Practice. Development Engineer also manages the delivery of engineering advice information to internal and external customers.

- The Senior Monitoring and Compliance officer is responsible for reporting compliance for three waters.

The organisational structure and Infrastructure Operations structure is illustrated in the following figures;

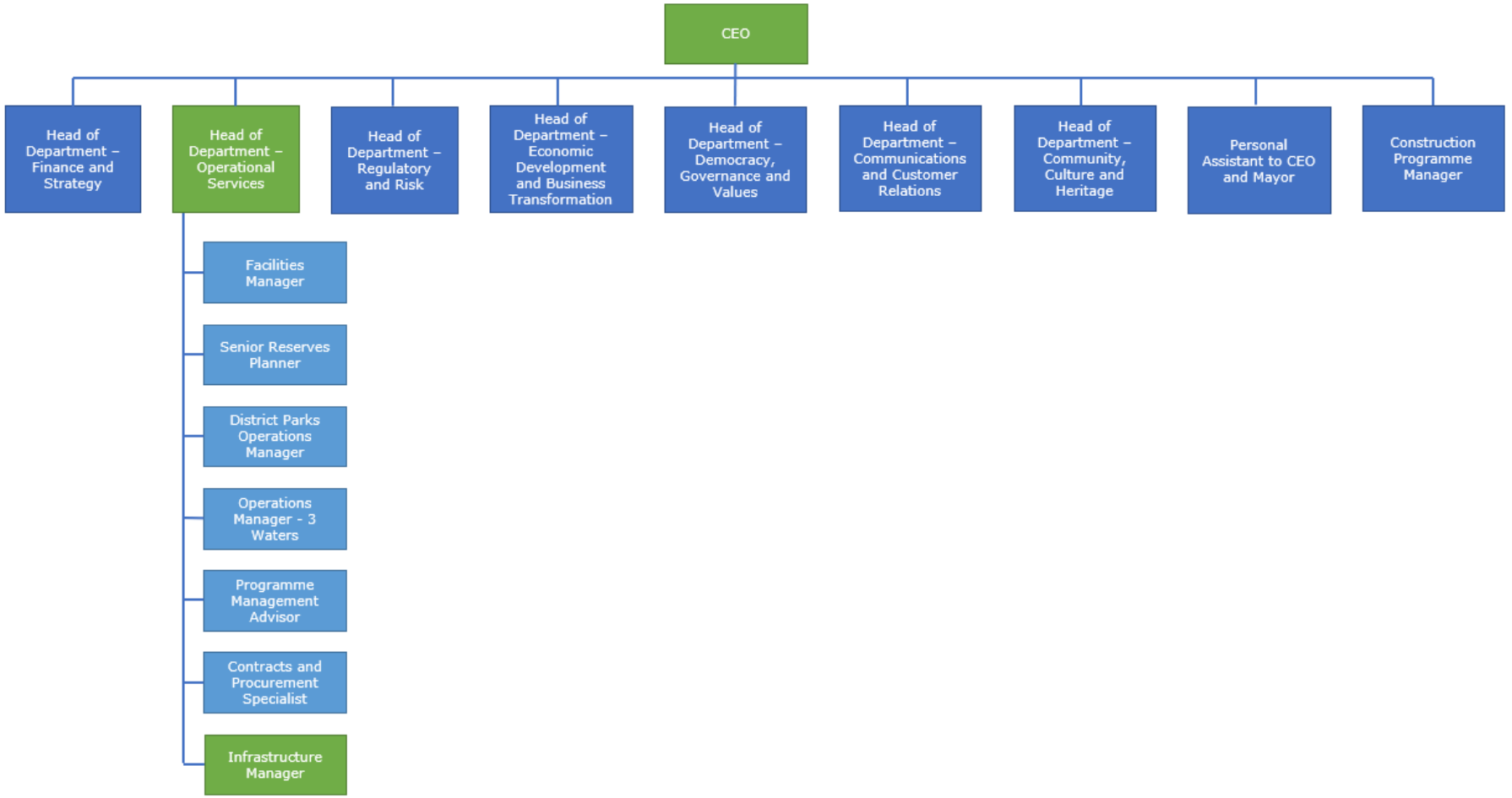


Figure 1: TDC Organisational Structure as at September 2020

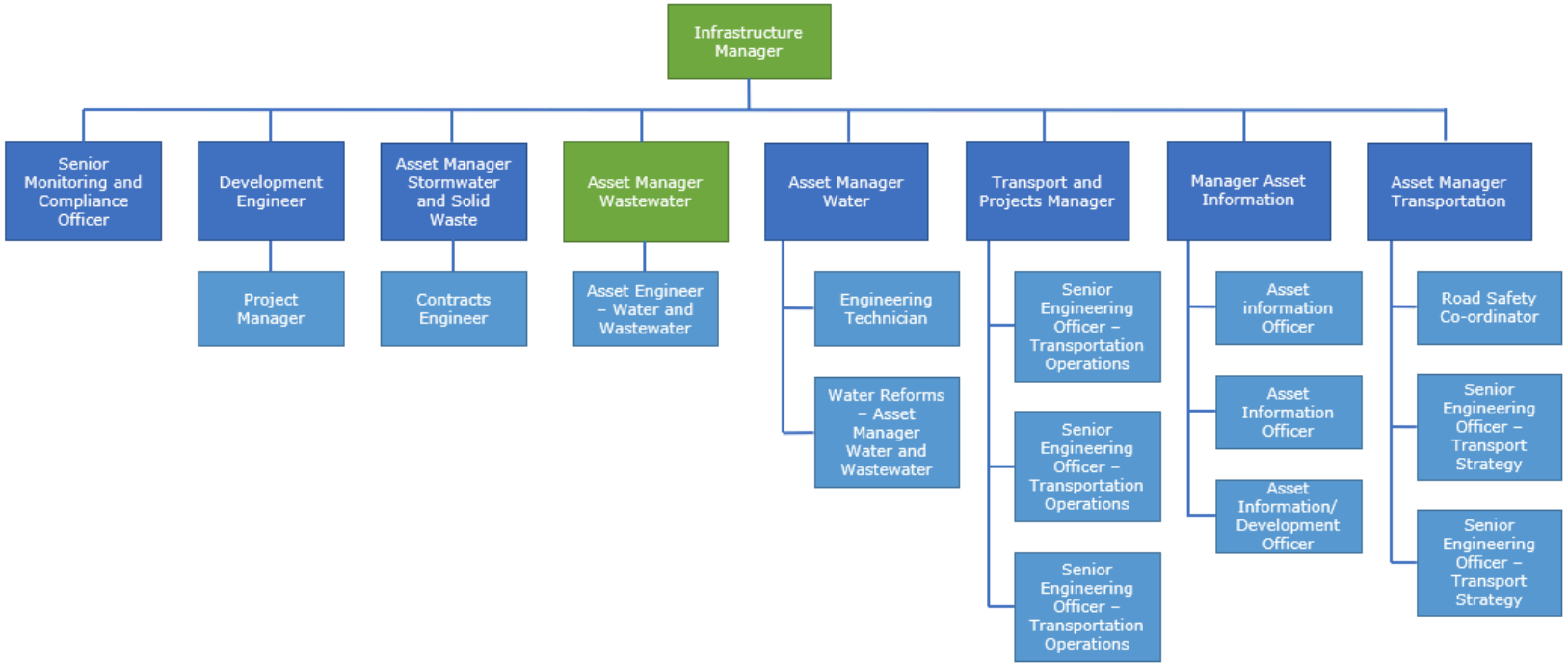


Figure 2: Infrastructure team Organisational Structure

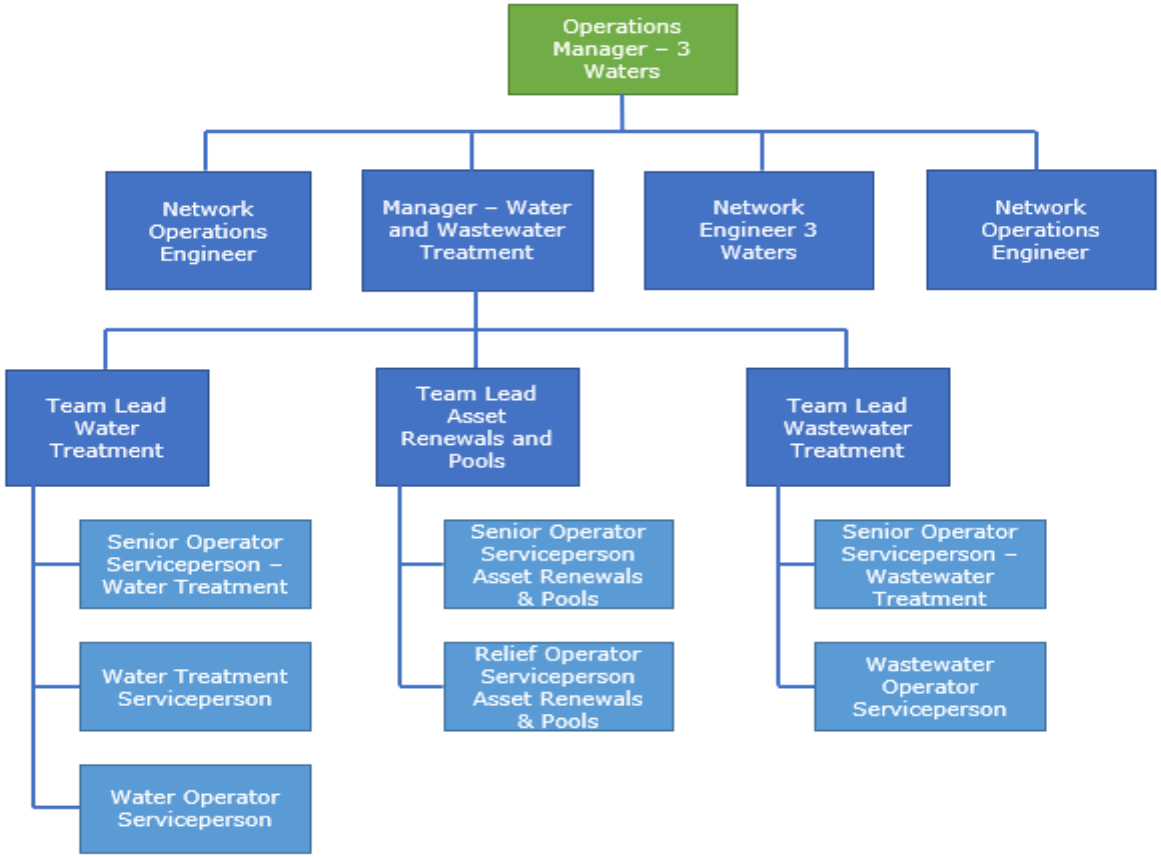


Figure 4: The Operational Services team Organisational Structure (i.e. who does the work and how it's managed)

2.0 DEFINITIONS

Anaerobic Digester — Anaerobic digestion is the breakdown of organic material by micro-organisms in the absence of oxygen.

As-built — Refers to a survey or drawing of the actual assets that have been constructed, recognising that they can sometimes vary from what was planned before work started on site. As-built drawings are needed to ensure that asset information systems contain data on the asset as it has been constructed, not how it was planned in theory.

Community Outcomes — Under section 5 of the Local Government Act 2002, a community outcome "means the outcomes for that district or region that are identified as priorities for the time being". Community outcomes are what New Zealanders want for their local community, now and in the future. Assets have a role in supporting the achievement of those aims.

Critical Assets — Those assets with a high consequence of failure. They are often found as part of a network, in which, for example, their failure would compromise the performance of the entire network.

Development Contributions — Funds paid, typically by developers, to local authorities to help with the cost of growth. These contributions are authorised by Part 8 of the Local Government Act 2002.

Imhoff Tank — The Imhoff tank is a chamber used for the reception and processing of wastewater. It is used for the clarification of sewage by sedimentation.

Lamphole — A sewer lamphole is a reticulation sewer end of line access point which allows limited access to facilitate inspection or clearing of obstructions.

Oxidation Ponds — Oxidation ponds are large, shallow ponds designed to treat wastewater through the interaction of sunlight, bacteria, and algae. Algae grow using energy from the sun and carbon dioxide and inorganic compounds released by bacteria in water. During the process of photosynthesis, the algae release oxygen needed by aerobic bacteria.

Sewage — Sewage is any water that has been used by residential, commercial or industrial premises. This could be water from the washing machine or toilet, or water used in a manufacturing process that needs to be discharged. Sewage is also referred to as Wastewater.

Sewerage System	The infrastructure that transports sewage or wastewater.
Trickling Filter	A trickling filter consists of a bed of highly permeable media on whose surface a mixed population of microorganisms is developed as a slime layer. The microorganisms treat the wastewater.
Vested Assets	Assets that are transferred to a public entity at nominal or zero cost. Typically, this might result from a situation where a developer has installed assets as part of developing a site and passes them to a public entity to manage, maintain, and deliver services through. The fair value of these assets has to be determined as they are integrated into the organisation's asset information system so that they can be appropriately managed.
Wastewater	Wastewater is any water that has been used by a residential, commercial or industrial premise. This could be water from the washing machine or toilet, or water used in a manufacturing process that needs to be discharged. Wastewater is commonly referred to as sewage.

3.0 ACRONYMS / ABBREVIATIONS

AM	Asset Manager
AMP	Asset Management Plan
AMS	Asset Management System
Audit	Audit New Zealand
CAPEX	Capital Expenditure
CCTV	Closed circuit television – common method of inspecting pipes
CEO	Chief Executive Officer
Council	Taupo District Council
CISP	Commercial & Industrial Structure Plan
CSA	Control Self Assessment (Risk Management)
DC	Development Contribution
ES	Environmental Services Group at Taupo District Council
EW	Environment Waikato (Waikato Regional Council)
GIS	Geographical Information System
GMS	Growth Management Strategy
IPG	Infrastructure and Parks Group at Taupo District Council
LDS	Land Disposal Site
LGA	Local Government Act
LoS	Level of Service
LTP	Long Term Plan (Council's ten-year planning document formerly the Long-Term Council Community Plan – LTP)
MBR	Membrane Bio-reactor – Wastewater Treatment Process
NZTA	New Zealand Transport Agency
OPEX	Operational Expenditure
PRAMP	Property Asset Management Plan

RMA	Resource Management Act
RPS	Environment Waikato Regional Policy Statement
SAF	Submerged Aerated Filter – Wastewater Treatment Process
SAMP	Solid Waste Asset Management Plan
SBR	Sequencing Batch Reactor – Wastewater Treatment Process
SLG	Senior Leadership Group (CEO, 2nd Tier Managers and selected 3rd Tier Managers)
SMP	Stormwater Management Plan
S.T.E.P.	Septic Tank
SWAMP	Stormwater Asset Management Plan
T24	Track 24
TDC	Taupo District Council
TRAMP	Transportation Asset Management Plan
TYP	Ten Year Plan
WAMP	Water Asset Management Plan
WW	Wastewater
WWAMP	Wastewater Asset Management Plan
WWTP	Wastewater Treatment Plant
WRC	Waikato Regional Council

4.0 ASSET DATA

4.1 Asset Summary and Valuation

Taupo District Council (TDC) is responsible for the management of wastewater assets with a replacement value (excluding land and buildings) of approximately $220 million as at August 2020.

The wastewater asset consists of a number of components:

- Network reticulation (sewer pipes, manholes, pump stations, septic tanks etc.)
- Treatment plants (including land disposal sites)

Specific assets are managed in different ways. Reticulation assets are being managed through *Asset Finda* asset management software; with pump station, treatment plant assets being managed by spreadsheet. In the future the intent is to use *Asset Finda* as the sole source of asset data and management for the three waters; including asset valuation. Overall high-level asset valuation record is currently maintained in spreadsheet format (TDC Wastewater 2019-2020.xlsx).

Asset Finda also holds condition assessment and maintenance records for reticulation assets.

The following table gives a summary of the asset valuation as at August 2020.

Type	Depreciated Replacement Value	Replacement Value
Treatment	$ 52,958,740	$ 103,383,054
Reticulation Network	$ 68,735,851	$ 117,242,425
TOTAL	**$ 121,694,592**	**$ 220,625,479**

Table 4-1: Wastewater Asset Valuation Summary

4.1.1 VALUATION PROCESS

All recorded components have been valued in terms of their replacement and depreciated replacement value. The valuation process is undertaken by an external valuer and has been performed in accordance with generally accepting accounting standards (NZ IAS16 Property, Plant and Equipment) and with NZ local authority asset valuation practices (NZ Infrastructure Valuation and Depreciation Guidelines).

The basic approach has involved:

a) Preparation of the valuation databases from the various sources of information supplied by TDC to an external valuer.
b) Adjustment of asset quantities, materials and techniques to reflect an optimum (least cost) modern equivalent replacement that offers the same level of service as that currently provided.
c) Calculation of optimum replacement cost (ORC) by multiplying asset quantities by appropriate unit construction cost rates and including an allowance for other costs (site establishment, professional fees and financial charges).
d) Prediction and assignment of economic and remaining lives.

e) Calculation of Optimised Depreciated Replacement Costs (ODRC) by deducting an allowance for depreciation, taking into account age, remaining life and residual value.

The revaluation of these assets is done by external consultants every three years.

4.2 Asset Component

4.2.1 TREATMENT PLANTS

4.2.1.1 Description

Taupo District Council manages 11 treatment plants and associated disposal systems with a replacement value of $ 103,383,054 at August 2020. A description of each of the Treatment Plants is included in Appendix D.

Wastewater Treatment Plant	Depreciated Replacement Value	Replacement Value
Acacia Bay	$ 932,058	$ 3,736,257
Atiamuri	$ 81,169	$ 322,647
Kinloch	$ 1,101,972	$ 5,326,757
Mangakino	$ 2,964,271	$ 4,920,340
Motuoapa	$ 2,335,316	$ 4,711,726
Motutere	$ 760,555	$ 1,300,416
Omori	$ 1,933,421	$ 4,227,429
Taupo	$ 36,265,485	$ 63,705,977
Turangi	$ 4,915,714	$ 11,344,995
Waitahanui	$ 792,597	$ 1,980,346
Whakamaru	$ 222,226	$ 535,467
Whareroa	$ 653,957	$ 1,270,697
TOTAL	**$ 52,958,741**	**$ 103,383,054**

Table 4-2: Treatment Plant Replacement Value

4.2.1.2 Condition

The conditions assessment of the wastewater treatment plants is recorded in an excel spreadsheet and is document continually being updated. Treatment plant assets and condition information will ultimately be recorded in *Asset Fina* once the assts information is loaded into that system.

4.2.1.3 Capacity/Performance

The performance of the wastewater treatment plants is generally assessed via resource consent compliance. Annual Reports are prepared for WRC on each plant detailing the performance of the plant for that year; effluent quality, volume records and environmental monitoring results.

Reticulation performance is measured primarily by the number of overflows and this a key Level of Service measure.

4.2.1.4 Treatment Plant Age

The wastewater treatment plants have been constructed at different times as required. In some cases, upgrades have occurred. This information is shown in the table below. The age and useful lives of the WWTP components are given in the condition assessment sheets contained in the appendices.

Table 4-3: Treatment Plant Type and Ages

Treatment Plant	Plant Type	Construction Year	Upgrade Year	Upgrade Type
Acacia Bay	SBR	1986	-	-
Atiamuri	Imhoff Tank		-	-
Kinloch	SBR	1988	2003 2009 2020 2021	Inlet works Decant system improvements Irrigation to public golf course Conversion to MBR (in progress)
Mangakino	SAF	2006	2007-08 2013-14	WWTP upgrade (SAF) Tertiary filter upgrade
Motuoapa	SBR	1987	2002 2016	Addition of second SBR tank Inlet Balance Tank
Motutere	SAF	1992	2006	SAF tanks
Omori	Oxidation Ponds	1970's	-	-
Taupo	Trickling Filters / Anaerobic Digesters	1975	1993 2009 2010-11	Rakaunui Road land disposal View Rd Land disposal site Additional trickling filter and digester
Turangi	MBR	2006	2014/15	Design and construction of lined ponds. The remediation plan for unused ponds will be done as scheduled in TYP.
Whakamaru	Textile Bed		2009 2019	Disposal Field New Textile Bed Reactor
Whareroa	Oxidation Ponds	1986	2008-09	Aeration and step screen

4.2.2 RETICULATION

4.2.2.1 Reticulation Description

Reticulation includes network pipes, manholes and lampholes and pump stations. An inventory of all reticulation is contained within the Asset Finda system and valuation spreadsheets.

Table 4-4: Scheme Reticulation Value

Scheme	Depreciated Replacement Value	Total Value
Acacia Bay	$ 3,502,783	$ 5,914,710
Atiamuri	$ 75,589	$ 336,942
Kinloch	$ 7,872,172	$ 10,486,426
Mangakino	$ 1,287,636	$ 3,178,590
Motuoapa	$ 2,078,004	$ 3,268,530
Motutere	$ 72,747	$ 115,866
Omori	$ 4,224,082	$ 7,073,506
Taupo	$ 40,697,812	$ 68,258,364
Turangi	$ 4,845,935	$ 12,223,642
Whakamaru	$ 200,595	$ 4,462,783
Waitahanui	$ 2,940,913	$ 481,522
Whareroa	$ 937,518	$ 1,441,543
Total	**$ 68,735,851**	**$ 117,242,425**

4.2.2.2 Reticulation Condition

Condition assessments on the pump stations occur as part of the current maintenance contract and are completed every six months. From these assessments key renewals works can be identified.

CCTV investigation has been completed on some sections of pipe work where we know there are issues. We have completed extensive CCTV condition assessment in Mangakino, Whakamaru and parts of Taupo and Turangi. We have undertaken significant renewal work in Whakamaru and Mangakino. Further condition assessment in Turangi is being undertaken in Turangi and Taupo in 2020 and 2021.

Some areas experience elevated inflow and infiltration; primarily in the Taupo industrial area and in Turangi generally.

4.2.2.3 Reticulation Performance

Reticulation performance is assessed through the number of services requests received on the particular asset, how many failures that occur and if any overflows occur.

The main problems within the reticulation are generally occur due to fat blockages or root intrusion. TDC is working to reduce the number of overflows caused by blockages.

4.2.3 PUMP STATIONS

4.2.3.1 Pump Station Condition

Each pump station condition is assessed formally every six months by the maintenance contractors. This includes looking at the condition of the following; pumps, valves, structural condition, ladder, platform, electrical and telemetry.

There is a gradual improvement process in place. Pumps in a duty standby configuration are generally replaced on failure.

Some of the electrical installations for wastewater pump station are approaching end of life and are due to be replaced with the most critical to be replaced first. The telemetry standards for WWPS has changed and with electrical upgrades comes the migration to the new telemetry network.

4.2.3.2 Pump Station Performance

Overall, the pump stations are performing as expected. As pumps are replaced it is expected that more efficient pumps can be used which will improve the pumping performance and reduce the operational costs through reduced power requirements.

As electrical and telemetry upgrades occur, we envisage that smarter control systems will be able to better manage how pump station operate.

4.3 Asset Confidence Rating

The asset valuation assigns confidence ratings to the source data and unit cost rates and to other items as appropriate. The overall confidence rating for the wastewater asset is **B-,** it is regarding to the Pipe Size, Materials, Age data that we collected in recently validation.

Table 4-5: Key to Asset Confidence Rating

Grade Score	Grade	Description	Accuracy
1-2	A	High Accuracies, data based on reliable documents	±5%
2-3	B	Data based on some supporting documentation	±10%
3-4	C	50% Estimated, data based on local knowledge	±15%
4-5	D	Significant Data Estimated / No Data, data based on best estimate of experienced person	±30%

Table 4-6: Summary of Asset Confidence Ratings

Attribute	Confidence Grade							
	D		C		B		A	
Asset data								
Physical properties (length/size/materials)								
Location								
Age								
Condition								
Performance								

Deterioration rate								
Financial data								
Opex								
Operation costs								
Maintenance costs								
Asset management costs								
Interest rates								
Depreciation								
Renewals								
Unit rates								
Project scope								
Cost estimates								
Capital works								
Demand forecast								
Project timing								
Project scope								
Project costs								
Project prioritisation								

5.0 LEVELS OF SERVICE

5.1 Introduction

A key objective of this Asset Management plan is to match the level of service provided by the asset with the expectations of customers. This requires a clear understanding of customers' needs, expectations and preferences.

The levels of service defined in this section will be used:

- to inform customers of the proposed type and level of service to be offered
- to enable customers to assess suitability, affordability and equity of the services offered
- as a focus for the Asset Management tactics proposed to deliver the required level of service
- to measure the effectiveness of this asset management plan
- to identify the costs and benefits of the services offered

The target levels of service for wastewater current industry standards and are based on:

Community Outcomes: Provide guidelines for the scope of current and future services offered and manner of service delivery and define general levels of service which the community wishes to receive.

Customer Expectations: Information gained from customers on expected quality and price of services.

Statutory Requirements: Legislation, regulations, environmental standards and Council By-laws that impact on the way assets are managed (i.e.: resource consents, building regulations, health and safety legislation). These requirements set the minimum level of service to be provided.

Strategic and Corporate Goals: Provide guidelines for the scope of current and future services offered and manner of service delivery and define specific levels of service which the organisation wishes to achieve.

Consultation Process and Strategic Linkages: The following Figure 5.1 identifies the consultation process and reporting requirements for levels of service. It also incorporates the links to strategic documents and gap analysis and how this links into the Annual Plan and Long-Term Plan.

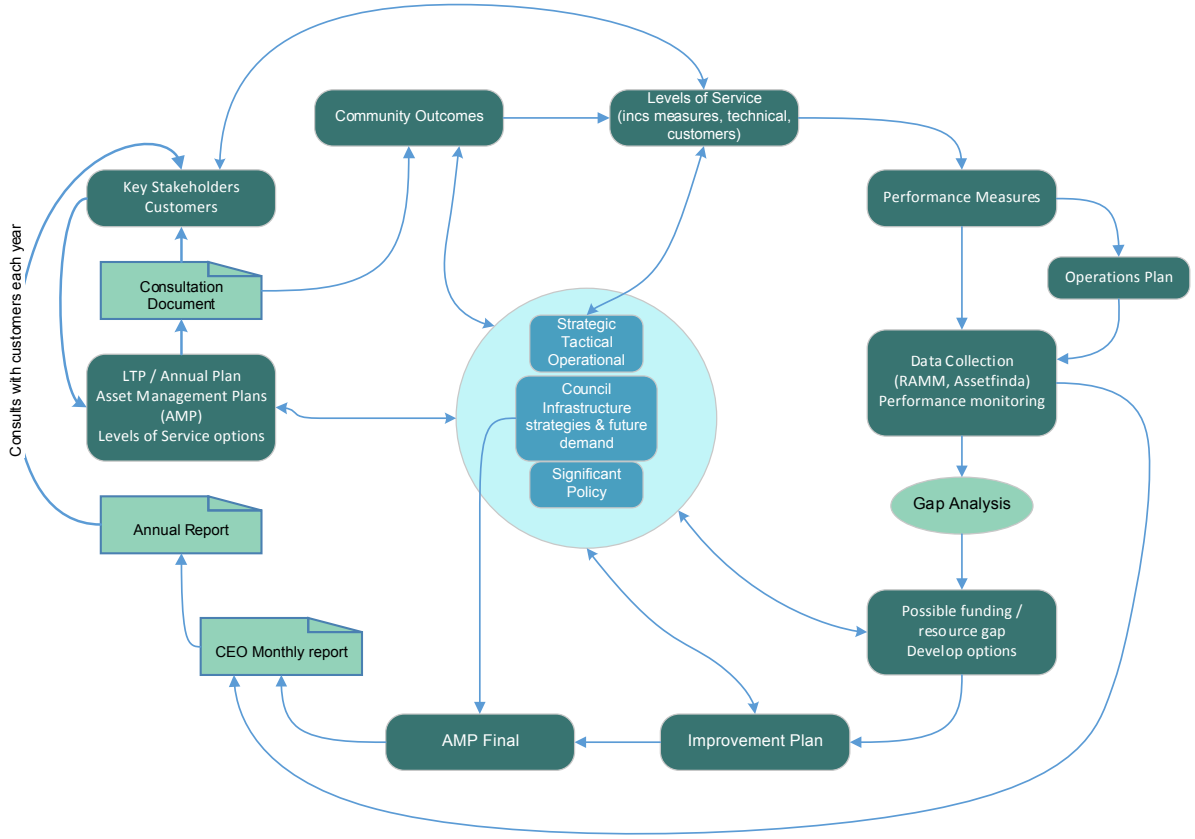


Figure 5.1: Consultation Process and Strategic Linkage Diagram

5.2 Types of Levels of Service

5.2.1 OPERATIONAL

Desired Levels of Service

The targets currently set are those carried over from the previous version WWAMP. These have been broadly developed as:

- Compliance to wastewater standards; these are the minimum targets set by legislated and reflect maintaining the current level of service through existing collection, transmission, and treatment systems
- Fault response times; set at levels achievable through available resources and current level of service
- Customer satisfaction; these are the minimum targets set by legislated and reflect maintaining the current level of service through existing collection, transmission, and treatment systems
- Demand management

Current operational levels of service for wastewater are scheduled in Table 2. The levels of service are "how we maintain our existing assets" for our customers.

Operational levels of service fall into two categories:

Technical (asset/product related) measures, which relate to the outputs the customer receives in terms of:

- Quality
- Capacity
- Quantity
- Environmental impacts
- Availability
- Cost/ affordability
- Legislative requirements
- Comfort
- Maintainability
- Safety
- Reliability and performance

Service Quality (service process related) measures, which relate to how the customer receives the service in terms of:

- Tangibles (information sheets etc.)
- Responsiveness
- Courtesy
- Empathy (understanding, individual attention)
- Assurance (knowledge, courtesy, trust, confidence)

5.2.2 TACTICAL

The levels of service stated within Table 5-1 are "why we build new assets". These are thresholds which warrant the creation of a new asset in order to maintain an optimum level of service for the asset.

5.2.3 IMPLEMENTATION

The implementation levels of service stated within Table 5-2 are "the standard we build a wastewater asset to".

5.2.4 NATIONAL

The management and optimal maintenance of sewerage systems is important for good public health and environmental outcomes. It is important for council to satisfy the customers and monitor the performance with the service provided – with both the operation of the service itself and the way in which complaints about the service are dealt with.

The department of internal affairs (DIA) has notified in Gazette: 21 November 2013 non-financial performance measure rules on key aspects of sewerage and the treatment and disposal of sewage to receiving environment. Council will be required to report on these performance measures for the level of service provided to community. These LoS are listed in section 5.3.

5.3 Current Levels of Service

Objective: To protect the environment and public health by providing appropriate collections, treatment and disposal of wastewater for all users connected to council's sewerage scheme.

Table Error! No text of specified style in document.**-1: Tactical Levels of Service**

Number	Community Outcome	Level of Service	How we measure it (customer)	How we measure it (technical)	Current LoS Performance	How We Monitor Performance	Target LoS Medium Term (1-3 years)	Target LoS Long Term (4-10 Years)
System and adequacy **T1**	Economy	Sufficient capacity to meet the demands of today and future growth	If a connection is immediately possible	Capacity of pipe work relative to capacity required. That all new development is able to be connected immediately if previously identified in the District Plan and in the Growth Model.	All developments that occur within already specified development areas, in accordance with growth model are not held up by infrastructure capacity issues.	Through the ability to allow subdivisions to occur.	All developments that occur within already specified development areas, in accordance with revised growth model are not held up by infrastructure capacity issues.	All developments that occur within already specified development areas, in accordance with revised growth model are not held up by infrastructure capacity issues.

Note: An asterisk* identifies the performance measure in LTP

Table Error! No text of specified style in document.**-2: Operational Levels of Service**

Number	Community Outcome	Level of Service	How we measure it (customer)	How we measure it (technical)	Current LoS Performance	How We Monitor Performance	Target LoS Medium Term (1-3 years)	Target LoS Long Term (4-10 Years)
Discharge Compliance **O1**	Environment	We manage the environmental impacts of our wastewater treatment and discharges THIS IS A DIA MANDITORY MEASURE.	No successful prosecutions to council or its staff.	Number of abatement notices ≤ 1 Number of infringement notices = 0 Number of enforcement orders = 0 Number of convictions = 0 If there are significant breaches, we need to provide further commentary.	Number of abatement notices =2 Number of infringement notices = 0 Number of enforcement orders = 0 Number of convictions = 0	Record and report and notices, orders, or convictions.	Number of abatement notices ≤ 1 Number of infringement notices = 0 Number of enforcement orders = 0 Number of convictions = 0	Number of abatement notices ≤ 1 Number of infringement notices = 0 Number of enforcement orders = 0 Number of convictions = 0
Discharge Compliance **O2**		Quality of effluent discharge from Treatment facilities is acceptable	Nitrogen reduction to the lake in Effluent after the treatment process	reduce by at least 20 % of total nitrogen discharge from WWTP within Lake catchment by 2020	Achieving 21.8 % TN reduction from discharges from all WWTP within Lake catchment	Routine TN test of effluent from treatment plants within lake catchment	Reduce the total nitrogen discharged from WWTP within the Lake catchment by at least 20 % of the benchmark average (10,310 kg/year) by 2020.	Reduce the total nitrogen discharged from WWTP within the Lake catchment by at least 20 % of the benchmark average (10,310 kg/year) by 2020. From 2020 onwards maintain this reduction.
System & adequacy **O3**	Economy Environment	Sewerage systems are maintained to an adequate standard to minimise overflows and minimise harm to the community. THIS IS A DIA MANDITORY MEASURE	Number of dry weather overflows from the sewerage system	Number of dry weather[1] overflows from the sewerage system expressed per 1000 sewerage connections the sewerage system (district wide). Where one event results in multiple dry weather overflows (points of discharge) each point of discharge must be counted in this measure.	1.73 overflow discharges per 1000 connections in 2019/20.	Implementation of sewer spill response plan. Analysis of contract reports and complaint records.	Target number of dry weather sewerage overflows ≤ 3 per thousand connections.	Target number of dry weather sewerage overflows ≤ 3 per thousand connections.

[1] Dry weather is a day when less than 1mm of rain has fallen during a continuous 24-hour period.

Number	Community Outcome	Level of Service	How we measure it (customer)	How we measure it (technical)	Current LoS Performance	How We Monitor Performance	Target LoS Medium Term (1-3 years)	Target LoS Long Term (4-10 Years)
Response times **O4**	Economy	Fault response time Response time from Council receiving notification of a fault to the time that service personnel reach the site of overflow or other fault is ≤1hr. Fault resolution time Resolution time from Council receiving notification of a fault to the time that service personnel confirms resolution of the blockage or other fault is within 4 hrs.	Percentage of failure responded within the specified time	Response time from Council receiving notification of the fault to the time that service personnel reach the site of the sewerage overflow resulting from a blockage.	Response time in 2019/20 was Not recorded.	Analysis of service requests and contactors KPI. This measure has not been able to be recorded because of issues relating to the recording of after-hours call outs. We are putting systems in place to ensure that this issue is rectified for the future.	Response time to get to site with sewerage overflow is ≤ 1 hr (90% of times) Time to resolve the problem is ≤ 4 hrs (85% of times).	Time to get to site with sewerage overflow • ≤1hr (95% of times) Time to resolve the problem • Within 4 hrs (90% of times)
		Fault response time (median) The median response time from Council receiving notification of a fault to the time that service personnel reach the site of the overflow or other fault. Fault resolution time (median) The median resolution time from Council receiving notification of a fault to the time that service personnel confirms resolution of the blockage or other fault. THIS IS A DIA MANDITORY MEASURE.	Median response time for attendance and resolution	Response time from Council receiving notification of the fault to the time that service personnel reach the site of the sewerage overflow resulting from a blockage	The median response time in 2019/20 was Not recorded. The median resolution time in 2019/20 was Not recorded.	Analysis of service requests and contactors KPI. This measure has not been able to be recorded because of issues relating to the recording of after-hours call outs. We are putting systems in place to ensure that this issue is rectified for the future.	Less than 1 hour. Less than 4 hours.	Less than 1 hour. Less than 4 hours.
Customer satisfaction **O5**	Environment + Economy	The number of complaints received by Council on: a) Sewerage odour b) Sewerage system faults c) Sewerage system blockages; and d) Council's response to issues with the sewerage system (expressed per 1000) Target number of complaints per 1000 connections ≤ 8. THIS IS A DIA MANDITORY MEASURE.	The sewerage system related issues resolved on time.	Number of complaints received on: a) Sewage odour b) sewerage system faults c) Sewerage system blockages d) The Council's response to issues with the sewerage system, expressed per 1000 connections to the Council sewerage system. Complaints taken from the request for service system. If there is more than one complaint about a single event, each complaint must be counted separately (not each event or occurrence).	During 2019/20 the following was reported 153 complaints *Number of complaints =8.3 /1000 connections*	Total number of complaints / (total rated properties/1000)	Target number of complaints per 1000 connections ≤ 8	Target number of complaints per 1000 connections ≤ 5

*** Emergency: It is an event which interrupts the reticulation of wastewater to treatment plant and can cause damage to environment and health to the community.**

5.4 Consultation

The most recent level of service consultation was undertaken as part of the preparation of the 2018-28 LTP. The most recent Levels of Service Survey conducted by TDC was in November 2016 and the survey asked for satisfaction. Ratepayers from the district were highly satisfied with the Council's provision of water services. Overall, 79 % were satisfied, while only 5 % were dissatisfied.

5.5 Changes to Level of Service

There are no proposed changes to levels of service.

There are still a few areas that are not meeting the current level of service and response times are not accurately measured. To maintain and reduce blockages and overflows into Lake Taupo, Streams and Rivers, the Three waters maintenance contract is awarded, and the performance of the contract was linked to LoS. Now council has proposed increased proactive maintenance and condition assessment including a sewer inspection contract.

Capital expenditure to improve the level of service includes;

- Treatment Plant works to manage total nitrogen discharges.
- Improvement to control system and SCADA for better monitoring and reporting
- Reticulation upgrades

Potential impacts on level of service could be: Local government amalgamation, long term funding constraints, regional delivery of water services, expiry of resource consents, funding changes, environmental effects, loss of access to land, treaty settlements.

6.0 FUTURE DEMAND

6.1 Factors Affecting Demand

There are a number of other factors that influence demand for the wastewater asset within the Taupo District. These are described below and include:

- Growth in population and the number of houses.
- Climate change and increase rainfall.
- Increasing standards requiring a higher level of treatment.

Other factors which influence the demand on the wastewater asset however not described in detail are usage efficiency, tourism/events, and leisure trends.

Council has a network model for the Taupo catchment and growth projections are modelled to identify where upgrade works might be required to meet demand.

The main growth areas in Taupo are the residential areas in the Wharewaka area and in the Nukuhau area. Kinloch continues to see strong growth.

6.2 Plans Related to Growth

In addition to general council planning documents such as the District Plan there are other planning documents that relate to demand in relation to the wastewater asset. These include: Growth Management Taupo 2050. Council's asset management plans need to be aligned with the strategy to ensure more efficient and affordable provision of infrastructure for the identified growth areas.

Plans related to growth:

- Growth Management Strategy – Taupo District 2050
- Taupo Town Centre Structure Plan
- Taupo Commercial & Industrial Structure Plan
- Kinloch Structure Plan
- Mapara Valley Structure Plan
- Southern Settlements Structure Plan

6.3 Growth

6.3.1 GROWTH MANAGEMENT STRATEGY – TD2050

In June 2006 the Council adopted Taupo District 2050 (TD2050), the Growth Management Strategy for the District and this document has been updated in 2018. The growth management strategy identifies where urban growth is anticipated so that land use and infrastructure planning can be aligned. TD2050 has been incorporated into the District Plan by way of plan changes, particularly Plan Change 21 which identifies the future urban growth areas.

6.3.2 GROWTH MODEL REVIEW (2020)

A *Taupō District Growth Model* has been in place since 1 July 2004 and was initially developed with the projected growth identified in TD2050. The *Taupō District Growth Model* and *Growth Model Review* have been updated and included in the current *Development Contributions Policy*, to reflect changes in the economy and the timing of key infrastructure. A growth model was developed based on the anticipated population

increase and associated residential lot increases in TD2050. The growth model is generally reviewed and updated every three years prior to the review of the asset management plans and development of the long-term plan.

However, no update has been made this LTP. Updated census data was not available in a timely manner, and the effects of the Covid-19 pandemic created uncertainty. The growth rate at Kinloch continued to strongly exceed the growth model. Therefore, timing of future growth projects in Kinloch are based on a greater growth rate than the growth model suggests.

Based on Census 2018 figures, Taupō District is home to 37,203 people who usually live here.

There are 20,844 private dwellings in the district 68% are occupied and 32% are unoccupied (likely holiday homes).

Recent Census Data	**2013**	**2018**
Population	32,907	37,203
Occupied dwelling	13,395	14,094
Unoccupied dwelling	6,171	6,588
Dwelling under construction	78	159
Total private dwellings	19,644	20,844

Demand is affected by a mixture of economic and population growth factors, including:

- Demographics
  - The 2018 census has seen Taupō's population grow by 13% since 2013.
  - Taupō's population is likely to continue to grow with it peaking at 2035.
- Community expectations – Council sets the communities levels of service has part of its *10-Year Plan* process based on community feedback and the decision-making processes.

It is dangerous from a financial aspect to overestimate the level of future growth. Where growth is overestimated the requirement for capital expenditure is overstated, essentially elevating costs to the ratepayer with limited ability to collect development contributions.

6.3.3 DEVELOPMENT CONTRIBUTIONS (DC) POLICY

Council's method for collecting funding for growth projects is outlined in detail in its DC Policy. This is determined in conjunction Under the DC Policy the cost of growth-related infrastructure is the responsibility of the developer. If the development does not occur as projected but the project still proceeds, the cost of the growth-related capital expenditure is transferred onto the rate payer, therefore ultimately increasing rates.

Growth in the number of lots and dwellings in the district has impacts on infrastructure demand. Growth Council's decision-making processes and planning documents such as the 10-Year Plan, the Asset Management Plans, and others.

It is dangerous from a financial aspect to overestimate the level of future growth. Where growth is overestimated the requirement for capital expenditure is overstated, essentially elevating costs to the ratepayer with limited ability to collect development contributions.

6.3.4 NEW LOTS TO BE CREATED

Consideration has been given to the optimistic discussions with developers, actual consent numbers over the past three years, demographic considerations[1] and officers' estimates when estimating the potential lot numbers outlined in the *DC Policy* and the *Growth Model*.

The table below outlines those estimates for the next ten years. The areas that are not predicted to have any growth are not shown.

Table 1: Estimated lots created over the period 2021 - 31 from the 2018 Taupo growth model

WASTEWATER	Taupo District Growth Model 2018 - 2050									
Financial Year Starting	**21/22**	**22/23**	**23/24**	**24/25**	**25/26**	**26/27**	**27/28**	**28/29**	**29/30**	**30/31**
Taupo South	55	55	55	55	55	30	30	0	20	0
Taupo North West	35	30	30	30	30	30	30	23	0	23
Taupo Town	20	20	20	20	20	20	20	17	20	17
Total Lots Created	110	105	105	105	105	80	80	40	40	40
Building Consents Issued	110	105	105	105	105	80	80	40	40	40
Acacia Bay (including lower Mapara Rd)										
Total Lots Created	2	2	2	2	2	2	2	2	2	2
Building Consents Issued	2	2	2	2	2	2	2	2	2	2
Kinloch Area										
Total Lots Created	12	0	7	0	0	0	0	10	10	10
Building Consents Issued	12	0	7	0	0	0	0	10	10	10
Mapara/Blue Ridge Area										
Total Lots Created	0	0	0	0	0	0	0	2	2	2
Building Consents Issued	0	0	0	0	0	0	0	2	2	2
Five Mile Bay/Waitahanui										
Total Lots Created	0	0	0	0	0	0	0	0	0	0
Building Consents Issued	0	0	0	0	0	0	0	0	0	0
Turangi										
Total Lots Created	2	2	2	2	2	2	2	2	2	2
Building Consents Issued	2	2	2	2	2	2	2	2	2	2
Hatepe										
Total Lots Created	0	0	0	0	0	0	0	0	0	0
Motuoapa										
Total Lots Created	0	0	0	0	0	0	0	0	0	0
Building Consents Issued	0	0	0	0	0	0	0	0	0	0
Pukawa/Omori/Kuratau										
Total Lots Created	0	3	0	3	0	3	0	0	0	0
Building Consents Issued	0	3	0	3	0	3	0	0	0	0
Whareroa										
Total Lots Created	15	0	0	0	15	0	0	0	0	0
Building Consents Issued	15	0	0	0	15	0	0	0	0	0

The estimated growth of the district; and water, wastewater, and transportation catchments; models are found in the *DC Policy* and *Taupō Growth Model*.

Note that the growth assumption used for Kinloch water and wastewater are greater than in shown in the current growth model.

6.3.5 OCCUPANCY PER DWELLING

The long-term trend for more than fifty years has been for a decrease in the number of people per dwelling however this has reversed slightly as shown by the 2018 census data.

Council uses a Household Equivalent Unit (HEU) to convert between population figures and the number of dwellings. Current Census data shows the HEU is approximately 2.6 people per household.

In Taupō District, home occupancy data is complicated by holiday homes which form approximately 34 % of the district's dwellings based on Census data.

However, because of this high number of possibly empty homes for a significant part of the year Council needs to consider peak usage and populations when determining demand. This peak demand is particularly relevant when considering demand on

infrastructure, such as water and wastewater outlined in detail in the *DC Policy* and *Taupō Growth Model*.

6.3.6 ESTIMATE - SCALE - SMOOTH

New lot projections are estimated on a development basis and then aggregated into catchments[2]. The data was then reviewed and amended in an officer discussion process which moderated the estimates with the aim to avoid reactive to the unpredictable upturns and downturns is growth.

6.4 Meeting increased/changing demand

Increased/changing demand can be met by using a number of methods including;

- Other non-asset-based methods e.g. education for the business community regarding Grease Trap maintenance and safe disposal, water conservation to reduce daily discharge volumes.
- Capital Expenditure – building new assets e.g. upgrading pump station, telemetry control system and pipes to cater for growth.
- Operational/maintenance expenditure – there may be a change to the cost to operate or maintain due to growth or to changes in demand. There may also be increased operations and maintenance due to new assets created e.g. increased maintenance costs of planned maintenance, CCTV, Telemetry, instruments for continuous monitoring, new AMS systems, and new water pipes built to cater for growth.

6.4.1 OTHER NON-ASSET BASED SOLUTIONS DEMAND MANAGEMENT TOOLS TO MANAGE CHANGES IN DEMAND

A unique feature of demand management in Taupo District is the managing of the fluctuating demand. Taupo has a large percentage of unoccupied dwellings which means that the base demand as compared to dwelling numbers is low. However, this demand increases significantly during peak holiday periods, tourist seasons and when there are large events in town.

TDC currently uses the following techniques to manage demand for water:

- Bylaws and legislation (including the District Plan).
- Water supply restriction using WDMP

Other areas which may be used in future are:

- Education through increased customer consultation.
- User charges.

6.4.2 CAPITAL EXPENDITURE DUE TO CHANGES IN DEMAND

The development of new connections in the district in the coming ten years will require new infrastructure as well as necessitating the upgrading of the treatment plants. The table below outlines the infrastructure required, the cost of this infrastructure and the timing of the provision of components with a Council cost share.

Table 6-2: Capital Projects Required to Service Taupo District Growth

Growth Project (Yrs 1 – 10)	Growth	When
Taupo wastewater Southern trunk main upgrade	9,800,000	2021-24
Kinloch wastewater WWTP upgrade	9,000,000	2021-22
Taupo wastewater Control gate bridge siphon	1,750,000	2021-23
Taupo wastewater - WWTP Primary Clarifier 3	2,100,000	2023-25
Motutere wastewater TP capacity upgrade	500,000	2023
Taupo wastewater - Eastern trunk main capacity upgrade (programme)	1,800,000	2024-27
Kinloch wastewater MBR upgrade - Second reactor	1,050,000	2028-2030
Whareroa wastewater - WWTP Irrigation expansion	230,000	2028

6.4.3 OPERATIONAL EXPENDITURE DUE TO CHANGES IN DEMAND

Operational budgets are increased in order to operate and maintain new assets. Funding of this expenditure is discussed in the financial section of this asset management plan (section 9) and strategies for operation and maintenance of assets in Section 4.

6.5 Community Expectations

Customers are primarily concerned with expansion of existing network services such as:

- Ability to connect to the current network
- No odour
- Cost of service
- Improved environmental outcomes; reduce sewer overflows and compliance with resource consents

Customer opinion is to be gauged more thoroughly as part of increased consultation, as detailed in the improvement plan.

6.6 Tourism

The effect of tourism is to increase the population and perceived growth over short periods.

Rather than try to estimate the number of people in the district at peak times we can more directly measure the impact of additional people through measurement of wastewater volumes received.

7.0 RISK MANAGEMENT

7.1 Introduction

Risk management is an important element in the development and management of assets. For asset management planning to be robust it must be integrated with other corporate risk management processes and that this encompasses strategies for Council's most critical assets, provide for the effects of asset failure and be integrated with disaster recovery plans and business continuity plans.

7.1.1 BACKGROUND

Council has reviewed and adopted in 1999 a Risk Management Charter. In 2016 Council's Audit & Risk Committee reviewed and adopted a revised Risk Management Charter. Council determined its overall policy would be to continually develop a Risk Management System that reflects best practice. Key objectives are:

- "to provide a logical and systematic method for identifying and managing risk within the organisation that will assist the organisation to meet its goals and objectives efficiently and effectively. This achieved by aligning key organisational objectives, risks and mitigating controls,

- to minimise losses and maximise opportunities – Risk Management is much about defining opportunities as avoiding and mitigating losses

- to improve the decision-making capabilities of staff recognising that the greatest knowledge and capacity for management of risks often rests with those"

Overarching strategies for managing risk within Council are:

- Council's Chief Executive Officer will establish and implement a Risk Management system that is relevant to the organisation and which reflects the provisions of Council's Charter. The overarching objective of that Risk Management system will be to identify, and where feasible, mitigate risk factors that might prevent Council achieving its objectives. Risk Management systems established within Council will reflect prevailing best practice including relevant industry standards – especially AS/NZS Risk Management Standard 4360 and AS/NZS ISO 31000.

- The ongoing effectiveness of Councils Risk Management systems and compliance with them by employees will be demonstrated by appropriate reporting to Council and its appropriate Committees. Currently this is achieved by programed reporting to Council's Audit & Risk Committee who meets 3-4 times per annum.

7.1.1.1 Current Risk Management Status

Council has an Audit & Risk Committee which oversees the governance of a Risk Management Programme within the Taupō District Council.

The accountability for the management of risk is not removed from the specific activity managers and the Senior Leadership Group or those responsible for the management of assets and this is viewed as a collaborative process between governance and management.

The high-level assessment of critical assets is done and now needs to be coordinated with the other assets to determine true criticality.

Business Continuity Plans (BCP) has been developed to maintain continuity of operations and service delivery as part of the implementation of Councils Risk Management Charter. Additionally, Council had adopted a Disaster Recover Plan in 2013 which also addresses aspects of asset management during emergencies.

It is envisaged that BCPs will assist council in the following advantages:

- To reduce the cost of disruptions
- To be more resilient
- To mitigate business risks and financial exposures
- To meet compliance
- To enhance health and safety
- To benefit from insurance premium discounts, reduced excesses and doors opening to new insurance markets.

TDCs wastewater network may is vulnerable to seismic, flood or volcanic events and the impact of failure of these assets.

TDC is also a member of the Waikato Utility Lifelines group and the wider Waikato Civil Defence and Emergency Management Group.

The Three waters maintenance contracts include an after-hours emergency response for network issues and customer complaints. After hours staff (Tauranga City call centre) receives calls and forward emergency calls directly to the contractor who are required to respond. The treatment plant operations team also has on call staff to attend to all treatment plant related emergencies.

7.2 Risk Management Process

The risk management process is an integral part of good management practice. It is an iterative process of continuous improvement that is embedded into existing practices or business improvement. Council aims to follow and reflect the risk management standards ISO 31000.2009 and AS/NZS 4360:2004.

a) Communicate and consult

Communicate and consult with internal and external stakeholders of Council as appropriate at each stage of the risk management process.

b) Establish the context

Establish the external, internal and risk management context in which the rest of the process will be undertaken. Criteria against which risk will be evaluated should be established and the structure of the analysis defined.

c) Identify risks

Identify where, when, why and how events could prevent, degrade, delay or enhance the achievement of asset's objectives.

d) Analyse risks

Identify and evaluate existing controls. Determine consequences and likelihood and hence the level of risk. This analysis should consider the range of potential consequences and how these could occur.

e) Evaluate risks

Compare estimated levels of risk against pre–established criteria and consider the Balances between potential benefits and adverse outcomes. This enables decisions to be made about the extent and nature of treatments required and about priorities.

f) Treat risks

Develop and implement specific cost-effective strategies and action plans for increasing potential benefits and reducing potential costs

g) Monitor and review

It is necessary to monitor the effectiveness of all steps of the risk management process. This is important for continuous improvement. Risks and the effectiveness of treatment measures need to be monitored to ensure changing circumstances do not alter priorities. To ascertain that, the condition assessment of the above ground assets was done regularly

by operating staff and planned and preventive maintenance are done to manage identified risk.

7.3 Council Funding for Risk

Council looks to provide funding for disaster recovery through a separate reserve. It appropriates funding each year to a Disaster Recovery Fund reserve to enable access to ready cash in the event of a natural disaster. This is intended to assist reinstatement and to finance any short-term needs in the time between any disaster and the recommencement of services.

As at June 2020, the reserve fund had a balance of approximately $2 million. Council has chosen not to insure its below ground assets given the position of its reserves.

Secondly the TEL Fund was established in September 1995 when TDC sold its investments in Taupō Electricity Ltd and Taupō Generation Ltd. The use of that sale capital and subsequent investment income generated each year are included in Council's Treasury Management Policy. One requirement of that policy is that the portfolio and funds are managed in a manner that reflects their potential utilisation as a disaster recovery fund in the event of a natural disaster within the Taupō district. The value of the fund as at 30th June 2020 is approximately $61.3m.

Thirdly Council maintains headroom within its Debt covenants with the Local Government Funding Agency (LGFA) that would allow it to borrow significant amounts in the event that Council needed to fund a disaster recovery programme.

With these three funding mechanisms in place Council considers it is prudently and effectively managing the risk of being able to fund both short and long term needs with respect to potential natural disaster and subsequent recovery operations in the district.

7.4 Lifelines Risk Assessment

TDC is a member of Waikato utility Lifelines Group. This process aims to identify components within the TDC wastewater network that may be vulnerable to seismic, flood or volcanic events and the impact of failure of these assets.

7.5 Risk Register

The specific asset risk register (see following) identifies risks, the consequence of the risk, the existing controls in place, treatment options and the level of risk to the asset as assessed and updated by Council Officers. A possible improvement to the register is to provide each treatment options with an associated cost and added to the risk register; however, these are yet to be costed by TDC.

The risk register is due for review.

7.6 Risk Classification Matrices

7.6.1 LIKELIHOOD

Likelihood scale for consideration based on **ANZS 4360** is as follows.

Table 7-1: Risk Likelihood

Level	Descriptor	Damage / Failure Indicative Frequency
A	Almost Certain	Once per year or more frequently
B	Likely	Once every three years
C	Possible	Once every ten years
D	Unlikely	Once every thirty years
E	Rare	Once every 100 years
N	Almost Impossible	Once in 10,000 years

7.6.2 CCONSEQUENCE

A consequence scale as a result of a risk event occurring based on **ANZS 3460** is shown for consideration as follows.

Level	Descriptor	Description
5	Catastrophic	Extreme Impact of damage or failure
4	Major	High impact of damage or failure
3	Moderate	Medium impact of damage or failure
2	Minor	Low impact of damage or failure
1	Insignificant	Very little impact of damage or failure
N	Negligible / Nil	Assessment is Nil

Table 7-2: Risk Consequence

7.6.3 RISK RATING MATRIX

With both likelihood and consequence scales in place a qualitative risk analysis matrix/level of risk can be determined.

	Consequences					
Likelihood	**N**	**1**	**2**	**3**	**4**	**5**
A	N	L	M	H	E	E
B	N	L	M	M	H	E
C	N	L	L	M	M	H
D	N	L	L	L	M	H
E	N	L	L	L	L	M
N	N	N	N	N	N	N

Table 7-3: Risk Matrix

The rating legend for the matrix, in this example, can be summarized as follows
E = Extreme risk

H = High risk
M = Moderate risk
L = Low risk
N = Negligible risk approaching nil / no risk

7.6.4 RISK MITIGATION MEASURES

High to Extreme risk would normally involve more detailed studies, action plans and management responsibility specifically assigned.

Moderate risk would be managed by monitoring or response procedures and management responsibility specified.

7.6.4.1 Summary of Identified High Risks

This is a summary of the high risks; the complete list is included as Table 7-5.

Table 7-4: Identified High Risks

Asset Risk	The Risk	Mitigation Measures
Fire	Damage to the Reticulation network due to structural/electrical system damage of pump station.	List of local contractors' details for easy access to a work force
Fire	Damage to the Treatment system due to structural/electrical system damage of the WWTP or computer system damage	Generators, operating procedures and a list of known local contractors.
Earthquake	Damage to treatment system due to: - Electrical system failure - Earth slip failure - Mechanical failure - Structural failure (e.g. Building, Control Room, settling tanks, clarifiers, trickling filters, digester, belt press, etc.) - Pipe fracture	Built-in generators, staff trained for servicing, list of local Contractors' details available when needed
Tomo's	Damage to the reticulation system due to pipe fracture, disconnection of joints and/or pump failure	List of local contractors' details for easy assess to a work force

Asset Risk	The Risk	Mitigation Measures
Contractual Obligations not fulfilled external parties	Failure in the reticulation system due to sewer overflows for failure to address capacity and maintenance issues.	Contract monitoring, performance measures
Contractual Obligations not fulfilled external parties	Failure to comply with resource consents	Contract monitoring, performance measures
Excessive costs to maintain, renew or create assets	Failure to comply with resource consents	Improved planning and investigation.
Public safety non-compliance / occupational health and safety non-compliance	Public safety and workers' safety are put at risk due to, Exposure to open manholes, Leaking pipes, Inadequate wastewater treatment, Contaminant discharges to the environment (immediate environs and the Lake), Inadequate training on operation of machines and other devices or Inadequate occupational health and safety trainings	Public Health Risk Mgt Plans, appropriate signage on hazard areas, upgrade of the WWTP and LDS, spill to environment procedure in place for both river and lake, adequate training provided, adequate PPE for staff)

Following failure of the truck sewer main at Lake Terrace in 2019, following a water main burst TDC have developed to GIS based tool to assist with identification of risk. The tool allows the user to test certain scenarios to identify potential risks to assets by adjusting different parameters. Whilst the tool has been developed it has not jet been used to aide with any risk assessments.

https://transbig.shinyapps.io/TDC_3Waters_Risk_Assessment_Portal_V4

7.7 Critical Assets

To date only work has been undertaken to identify critical wastewater assets such as pipes, pump stations, tanks and structures. This work continues to be developed and data is being captured in the AMS.

Table 7-5: Wastewater Risk Register

Asset Management Plan

Risk Register

Division:	Infrastructure	Compiled by:	Ramesh Sharma	Date:	June 2017
Asset:	Wastewater	Reviewed by:	Denis Lewis	Date:	September 2017

NATURAL RISKS

Asset Risks	The risk: What can happen and how it can happen	The consequences of an event happening		Adequacy of existing controls	Consequence rating	Likelihood rating	Level of risk	Risk priority
		Consequences	Likelihood					
Earthquake	Damage to reticulation system due to: - Pipe fracture - Disconnections in joints - Pump failure - Earth slip - Land subsidence causing changes of grade in pipe network	Major	Unlikely	E (list of local Contractors' details available when needed)	4	D	M	
	Damage to treatment system due to: - Electrical system failure - Earth slip failure - Mechanical failure - Structural failure (e.g. Building, Control Room, settling tanks, clarifiers, trickling filters, digester, belt press, etc.) - Pipe fracture	Catastrophic	Unlikely	E (built-in generators, staff trained for servicing, list of local Contractors' details available when needed)	5	D	**H**	
	Groundwater contamination due to: - Earth slips in LDS	Major	Unlikely	NC	4	D	M	
	Inaccessibility to network due to footpath/road system failure	Minor	Unlikely	E (emergency road repair)	2	D	L	
Volcanic Eruption/ Ash fall	Damage to treatment system due to: - Clogging of open pipes with ash in the WWTPs - Increased solid biomass on the tanks due to ash fall - Corrosion of equipment due to acid content of the ash	Moderate	Unlikely	E (water blasting, vacuum trucks, adequate capacity of the grit chamber in the WWTP,	3	D	L	
	Inaccessibility of the WWTP and inability to operate the plant	Minor	Unlikely	E (water blasting of access way)	2	D	L	
Lahar	Damage to the treatment system due to:	Moderate	Rare	E	3	E	L	

Asset Risks	The risk: What can happen and how it can happen	The consequences of an event happening		Adequacy of existing controls	Consequence rating	Likelihood rating	Level of risk	Risk priority
		Consequences	Likelihood					
	- Increased solid biomass on the tanks - Potential corrosion of pipes and machines			(water blasting, vacuum trucks)				
	Inaccessibility of the WWTP and inability to operate the plant	Minor	Rare	E (water blasting of access way)	2	E	L	
Flooding	Inaccessibility of the WWTP and inability to operate the plant	Minor	Unlikely	E (use of big trucks)	2	D	L	
	Damage to the treatment system due to: - Silting of tanks - Tank overflow	Moderate	Unlikely	E (vacuum truck, WWTP has 1-day storage capacity for dry-weather flow, pump out to the LDS which has max of 2-day irrigation capacity)	3	D	L	
	Reticulation system overflow due to: - Stormwater finding its way through to sewer pipes Silting of pipes	Major	Unlikely	NC	4	D	M	
Tsunami	Damage to reticulation network due to: - Scouring and damage to footpath/road system - Destruction of pump stations and other structures	Major	Rare	E (pond the area and suck with vacuum truck)	4	E	L	
	Inaccessibility of the WWTP and inability to operate the plant	Minor	Rare	E (water blasting of access way)	2	E	L	
Fire	Damage to the reticulation network due to: - Structural/electrical system damage of pump station -	Catastrophic	Possible	E (list of local Contractors' details available when needed)	5	C	H	
	Damage to the treatment system due to: - Structural/electrical system damage of the WWTP - Computer system damage	Catastrophic	Possible	E (built-in generators, staff trained for servicing, list of local Contractors' details available when needed)	5	C	H	
Lightning	Damage to the reticulation network due to: - Structural/electrical system damage of pump station	Major	Rare	E (list of local Contractors' details available when needed)	4	E	L	
	Damage to the treatment system due to: - Structural/electrical system damage of the WWTP - Computer system damage	Major	Rare	E (built-in generators, staff trained for servicing, list of local Contractors' details available when needed)	4	E	L	

Asset Risks	The risk: What can happen and how it can happen	The consequences of an event happening		Adequacy of existing controls	Consequence rating	Likelihood rating	Level of risk	Risk priority
		Consequences	Likelihood					
High winds	Damage to the reticulation network due to: - Structural/electrical system damage of pump station	Major	Unlikely	E (list of local Contractors' details available when needed)	4	D	M	
	Damage to the treatment system due to: - Structural/electrical system damage of the WWTP - Computer system damage	Major	Unlikely	E (built-in generators, staff trained for servicing, list of local Contractors' details available when needed)	4	D	M	
Landslide/Slip	Damage to reticulation system due to: - Pipe fracture - Disconnections in joints - Pump failure - Earth slip - Land subsidence causing changes of grade in pipe network	Major	Possible	E (list of local Contractors' details available when needed)	4	C	M	
	Damage to treatment system due to: - Electrical system failure - Earth slip failure - Mechanical failure - Structural failure (e.g. Building, Control Room, settling tanks, clarifiers, trickling filters, digester, belt press, etc.) - Pipe fracture	Major	Unlikely	E (built-in generators, staff trained for servicing, list of local Contractors' details available when needed)	4	D	M	
	Groundwater contamination due to: - Earth slips in LDS	Major	Possible	NC	4	C	M	
	Inaccessibility to network due to footpath/road system failure	Minor	Possible	E (emergency road repair)	2	C	L	
Tomos	Damage to reticulation system due to: - Pipe fracture - Disconnections in joints - Pump failure - Land subsidence causing changes of grade in pipe network and loss of support for pipe system	Major	Likely	E (list of local Contractors' details available when needed)	4	B	H	
	Damage to treatment system due to: - Structural failure (e.g. Building, Control Room, settling tanks, clarifiers, trickling filters, digester, belt press, etc.) - Pipe fracture	Major	Possible	E (built-in generators, staff trained for servicing, list of local Contractors' details available when needed)	4	C	M	

Asset Risks	The risk: What can happen and how it can happen	The consequences of an event happening		Adequacy of existing controls	Consequence rating	Likelihood rating	Level of risk	Risk priority
		Consequences	Likelihood					
	Groundwater contamination due to: - Land subsidence in LDS	Major	Possible	NC	4	C	M	
	Inaccessibility to network due to footpath/road system failure	Minor	Possible	E (emergency road repair)	2	C	L	
Geothermal activity	Damage to the reticulation system due to: - Potential corrosion of pipes	Major	Possible	E (water blasting, ceramic pipes are used in high-risk areas)	4	C	M	
	Damage to the treatment system due to: - Potential corrosion of pipes and machines	Moderate	Possible	E (immediate water blasting on-site for surfaces and engage Contractors for water blasting of pipes every 3 months)	3	C	M	
	Inaccessibility of the WWTP and inability to operate the plant	Minor	Unlikely	E	2	D	L	

EXTERNAL RISKS

Asset Risks	The risk: What can happen and how it can happen	The consequences of an event happening		Adequacy of existing controls	Consequence rating	Likelihood rating	Level of risk	Risk priority
		Consequences	Likelihood					
War	Damage to reticulation system due to: - Pipe fracture - Disconnections in joints - Pump failure	Major	Almost impossible	NC	4	N	N	
	Damage to treatment system due to: - Electrical system failure - Mechanical failure - Structural failure (e.g. Building, Control Room, settling tanks, clarifiers, trickling filters, digester, belt press, etc.) - Pipe fracture - Inability to operate the WWTP	Major	Almost impossible	NC	4	N	N	
	Inaccessibility to the network	Minor	Almost impossible	NC	2	N	N	
Terrorism	Damage to reticulation system due to: - Destruction by terrorists	Major	Rare	E (list of local Contractors' details available when needed)	4	E	L	
	Damage to treatment system due to: - Destruction by terrorists - Inaccessibility of the WWTP and inability to operate the plant	Major	Rare	E (list of local Contractors' details available when needed, staff trained for servicing)	4	E	L	
	Inaccessibility to the network	Minor	Rare	NC	2	E	L	
Protests/Riots	Damage to reticulation system due to: - Destruction by protesters	Major	Unlikely	E (list of local Contractors' details available when needed)	4	D	M	
	Damage to treatment system due to: - Destruction by protesters - Inaccessibility of the WWTP and inability to operate the plant	Major	Unlikely	E (list of local Contractors' details available when needed, staff trained for servicing)	4	D	M	
	Inaccessibility to the network	Minor	Unlikely	NC	2	D	L	
Vehicle Accident	Damage to reticulation system due to: - Ramming into the pipes, manholes and pump stations	Moderate	Possible	E	3	C	M	

Asset Risks	The risk: What can happen and how it can happen	The consequences of an event happening		Adequacy of existing controls	Consequence rating	Likelihood rating	Level of risk	Risk priority
		Consequences	Likelihood					
	Inaccessibility of the network along the footpath/road after an accident	Minor	Possible	E (immediate clearing)	2	C	L	
	Inability to address operational issues in the network and WWTP if accident involves staff	Moderate	Possible	E (enough staff to cover operations)	3	C	M	
	Damage to treatment system due to: - Ramming of buildings and other structures - Inability to operate the WWTP	Moderate	Possible	E (list of local Contractors' details available when needed, staff trained for servicing)	3	C	M	
Contractual obligations not fulfilled by external parties	Failure in the reticulation system due to: - Sewer overflows for failure to address capacity and maintenance issues	Major	Likely	E (scoring system monitored closely, termination of contract for non-compliance and tendering new one)	4	B	H	
	Failure to undertake network maintenance and maintain the required network performance standard	Moderate	Likely	E (scoring system monitored closely, termination of contract for non-compliance and tendering new one)	3	B	M	
	Failure to comply with Resource Consents	Major	Likely	E (scoring system monitored closely, termination of contract for non-compliance and tendering new one)	4	B	H	
	Failure to implement required works due to lack of feasibility and design works	Minor	Likely	E (scoring system monitored closely, termination of contract for non-compliance and tendering new one)	2	B	M	
Excessive costs to maintain, renew or create assets	Failure to maintain the required network performance standard	Moderate	Likely	E (Will allow for unplanned costs)	3	B	M	
	Failure to comply with Resource Consents	Major	Likely	E (Will allow for unplanned costs)	4	B	H	
	Failure to address service demand	Moderate	Likely	E (Will allow for unplanned costs)	3	B	M	
Lack of contractors to carry out works	Failure in the reticulation system due to: - Sewer overflows for failure to address capacity and maintenance issues	Major	Possible	NE	4	C	M	

Asset Risks	The risk: What can happen and how it can happen	The consequences of an event happening		Adequacy of existing controls	Consequence rating	Likelihood rating	Level of risk	Risk priority
		Consequences	Likelihood					
	Failure to undertake network maintenance and maintain the required network performance standard	Moderate	Possible	NE	3	C	M	
	Failure to comply with Resource Consents	Major	Possible	NE	4	C	M	
	Failure to implement required works	Moderate	Possible	NE	3	C	M	

OPERATIONAL RISKS

Asset Risks	The risk: What can happen and how it can happen	The consequences of an event happening		Adequacy of existing controls	Consequence rating	Likelihood rating	Level of risk	Risk priority
		Consequences	Likelihood					
Legislative non-compliance	Failure to achieve Levels of Service due to: - Non-compliance to Resource Consents - Unlawful discharges to the environment	Major	Possible	E (capital/renewal/maintenance works programmed)	4	C	M	
	Court subpoena for unlawful acts; specifically, violation to RMA	Major	Possible	E (to be addressed accordingly)	4	C	M	
Lack of asset condition assessment and valuation	Failures in the reticulation system due to: - Sewer overflows - Pipe fracture	Major	Possible	E (development of an in-house Asset Management System for proper planning)	4	C	M	
	Failure in the treatment system due to: - Electrical system failure - Mechanical failure - Structural failure (e.g. Building, Control Room, settling tanks, clarifiers, trickling filters, digester, belt press, etc.) - Pipe fracture	Major	Possible	E (Acquisition of proprietary AMS to replace in-house Asset Management System for proper planning)	4	C	M	
	Failure in the disposal system due to: - Saturation of the field as a result of insufficient capacity	Major	Possible	E (Acquisition of proprietary AMS to replace in-house Asset Management System for proper planning	4	C	M	
	Failure to come up with robust capital works, renewal and operational programmes	Moderate	Possible	E (Acquisition of proprietary AMS to replace in-house Asset Management System for proper planning	3	C	M	
	Expenditures are not optimised	Minor	Possible	E (Acquisition of proprietary AMS to replace in-house Asset Management System	2	C	L	

Asset Risks	The risk: What can happen and how it can happen	The consequences of an event happening		Adequacy of existing controls	Consequence rating	Likelihood rating	Level of risk	Risk priority
		Consequences	Likelihood					
				for proper planning				
Incorrect financial projections to create, renew or maintain assets	Delayed project completion	Moderate	Possible	E (Plan Improvement)	3	C	M	
	Over- or under spent budget creating impact on rates and development contributions	Moderate	Possible	E (Plan Improvement)	3	C	M	
Not meeting community expectations	Loss of ratepayers' faith and trust to Council due to: - Failure to maintain network performance standard - Failure to deliver the target levels of service	Major	Possible	E (Plan Improvement)	4	C	M	
Public safety non-compliance/ Occupational Health and safety non-compliance	Public safety and workers' safety are put at risk due to: - Exposure to open manholes - Leaking pipes - Inadequate wastewater treatment - Contaminant discharges to the environment (immediate environs and the Lake) - Inadequate training on operation of machines and other devices - Inadequate occupational health and safety trainings	Major	Likely	E (Public Health Risk Mgt Plans, appropriate signage on hazard areas, upgrade of the WWTP and LDS, spill to environment procedure in place for both river and lake, adequate training provided, adequate PPE gears for staff)	4	B	H	
Loss of asset data/information on assets	Failure to maintain network performance standard due to: - Potential delay in work programmes - Unreliable asset management planning	Moderate	Unlikely	E (Robust database and Asset Mgt. System)	3	D	L	
	Increased expenditure to recollect the data Failure of in-house AMS	Minor	Unlikely	E (Robust database and Asset Mgt. System)	2	D	L	
High staff turnover and absence of staff to undertake wastewater asset management	Failure to maintain network performance standard due to: - Loss of historical and current knowledge base - Planned programmes tend not to be sustainable - Learning periods consume significant work time as new staff comes in - Institutional/Organisational development is not sustained.	Moderate	Likely	E (Organisation restructured to ensure Network Engineers have the capability to address issues across disciplines)	3	B	M	
Lack of management support to the required work programmes	Failure to maintain network performance standard due to: - Disapproval of required work programmes - Insufficient justification to support the program proposals	Moderate	Likely	E (Proper investigations and scoping to justify the planned works)	3	B	M	

Asset Risks	The risk: What can happen and how it can happen	The consequences of an event happening		Adequacy of existing controls	Consequence rating	Likelihood rating	Level of risk	Risk priority
		Consequences	Likelihood					

8.0 LIFECYCLE MANAGEMENT PLAN

The Taupo District occupies a large proportion of the Central North Island Volcanic Plateau together with the complete catchment area of Lake Taupo and Upper Waikato River areas. Whilst most of the District is situated within the Waikato Region, a small proportion also intrudes into the Bay of Plenty, Hawkes Bay and Manawatu-Wanganui regions. The District comprises 6,354 km^2 of land and 616 km^2 of lake.

Prior to 1950, the District was largely undeveloped and sparsely populated. Since that time, population has increased rapidly to approximately 37,203 (2018). Urban growth has focused on Taupo Township and various lakeshore settlements, whilst rural land development has been dramatic with the conversion of scrub wastelands to productive farmlands and vast exotic forest plantations and future conversion to lifestyle properties.

Lake Taupo and its surrounds have also become an important national and international tourist destination, renowned for its scenic attractions and wide-ranging recreational activities.

Taupo District Council provides wastewater services to many urban areas within the district including Taupo, Turangi, Tokaanu, Acacia Bay, Kinloch, Motuoapa, Omori, Kuratau, Pukawa, Whareroa, Motutere, Whakamaru, Atiamuri and Mangakino.

This section contains life cycle management plans for the following wastewater asset components:

- Treatment Plants
- Reticulation (pipes, manholes, lamp holes and pump stations)

Many of these assets are seen as critical assets where failure would have a dramatic impact. This has been discussed in further detail in the Risk Management section.

Background data for the asset type including asset description, capacity, performance, condition and valuations is included in the Asset Data section.

This section contains the general *management strategies,* to achieve the levels of service defined in Level of Service section. These strategies are divided into four main work categories (routine maintenance, renewal, capital and disposal) as illustrated in the following figure.

Detail of each of the schemes is included in the appendices.

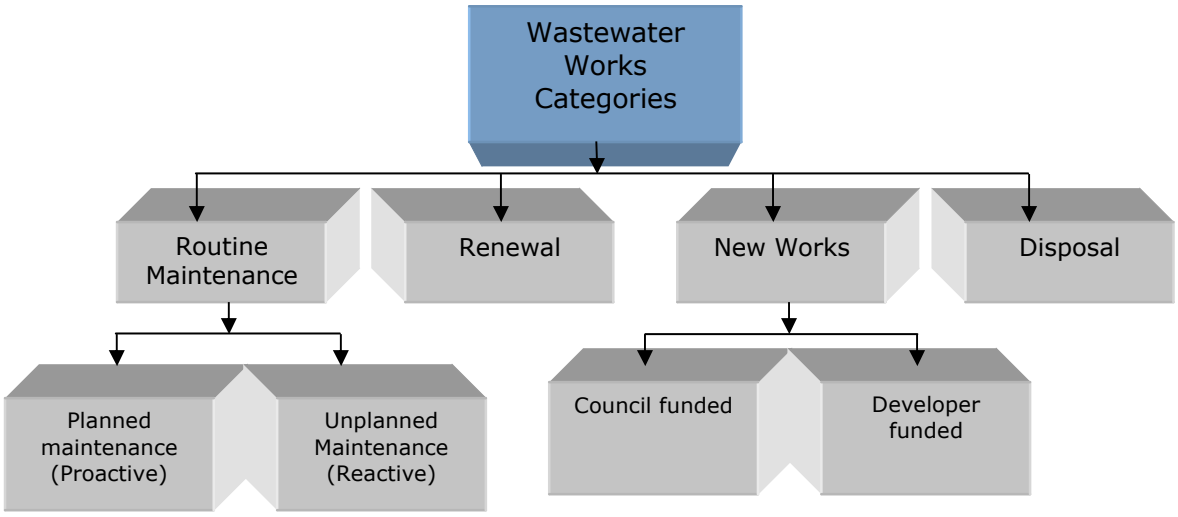


Figure 8-1: Asset Works Categories

The work categories are defined as follows:

Routine Maintenance

Routine maintenance falls into two broad categories as follows:

- Planned (Proactive) Maintenance: Proactive inspection and maintenance works planned to prevent asset failure.
- Unplanned (Reactive) Maintenance: Reactive action to correct asset malfunctions and failures on an as required basis (i.e. emergency repairs).

A key element of asset management planning is determining the most cost-effective blend of planned and unplanned maintenance as illustrated in the following figure.

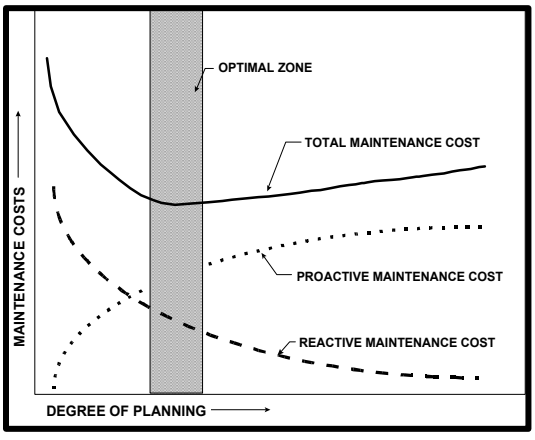


Figure 8-2: Balancing Proactive and Reactive Maintenance

Renewals

This includes replacement and rehabilitation of existing assets to their original condition and capacity.

New Works
Creation Works: New works which extend or upsize assets, which are required to cater for new development and growth. Creation works fall into two separate categories as follows:

- Council funded - Works funded and constructed by TDC.
- Developer funded - Works funded by developers as part of sub divisional development or by way of contributions that are then vested in Council.
- Asset disposal: Retirement or sale of surplus assets.

A forecast of the 10-year expenditure for each asset group in each of the categories outlined above has been provided in the Financial Summary section.

8.1 Overarching issues/ Strategies for Wastewater

Council is responsible for collection, treatment and disposal of wastewater from residential, commercial and industrial properties within designated drainage areas of the district in a way, which safeguards the environment and protects public health. The objective is to provide cost-effective wastewater treatments that meet the scheme capacity requirements and also the resource consent conditions (refer section 8.3).

Reducing nitrogen discharge by at least 20 % of into Lake Taupo Catchment by 2020 is also the part of responsibilities under the lake Taupo protection project.

Council has developed a long-term plan to meet these requirements and the activities include:

- Carry out condition assessment of the sewerage network and CCTV
- To progressively upgrade wastewater reticulation network.
- Develop a wastewater strategy for total nitrogen discharges
- Regular assessment of wastewater quality throughout district as required by resource consent conditions
- Review asset performance by monitoring the operational data.
- Implementation of the Trade Waste Bylaw
- Improve Asset Management Systems

8.2 Service Delivery & Rationale

The wastewater services are carried out by several providers.

Service	Provider	Rationale (Why?)
Asset Management	Council	We retain in-house knowledge
WTP operation	Council	We retain in-house knowledge
Management of Maintenance Contracts	Council Business unit	Control of cost and we retain in-house knowledge
Minor concept design	Council	We retain in-house knowledge
Major detail design	Tendered	To capitalise on external expertise resource/ experience and take advantage of competition.
Maintenance	Tendered	To capitalise on external specialist resource/ experience and take advantage of competition.

The following table shows a summary of all TDC operation, maintenance and renewals contracts:

Contract Name	Contract No.	Contractor	Approx. Value ($)	Term (Yrs)	Maintenance / Renewal / Asset Creation
Three Waters Network Maintenance Contract	TDC/1516/155	Downer	$11,399,600 (Total for 5 years)	Start date: 1 July 2016 Term: 5 +2 +2	Mostly reactional electrical and mechanical maintenance but includes some renewal and new works. Includes water wastewater and stormwater.
Vermicomposting Operations	TDC/1617/183	MyNoke	Approximately $300,000 p.a.	Start date: 15 Dec 2016 Term: 5 +5	Operational
Sludge cartage Contract	TDC/1819/265	Site Care	$398,926 p.a.	Start date: 1 July 2019 Term: 6	Operational
Effluent Disposal Farms Crop Harvesting	TDC/1819/264	Contractor: Pritchard Agricultural Contractors	Approximately $80,000 p.a. Plus, bale ownership is the Contractors	Start date: 1 Oct 2019 Term: 6 +3	Operational and maintenance
SCADA Systems Integrator Contract	TDC/1819/266	CR Automation	Approximately $300,000 p.a.	Start date: 1 July 2019 Term: 3	Operational and maintenance Water and Wastewater
Laboratory Testing Services	TDC/1920/300	Eurofins	Approximately $550,000 p.a.	Start date: 8 Jun 2020 Term: 5 +2 +2	Operational Water and Wastewater

Contract Name	Contract No.	Contractor	Approx. Value ($)	Term (Yrs)	Maintenance / Renewal / Asset Creation
SL-Rat Surveying and Directed Sewer Cleaning and CCTV Condition Assessment of Taupo's Sewer Network	TDC/1819/290	Downer	$ 990,000 (Total for 3 years)	Start date: 1 Sep 2019 Term: 3	Operational and maintenance

Table 8-1: TDC Operations Maintenance and Renewal Contracts

8.2.1 CONTRACT TYPES

TDC has a Procurement Policy and procurement guide that sets out how TDC procures the products and services it needs. Refer the Procurement Policy for details.

8.3 Asset Type

8.3.1 TREATMENT PLANTS

Overall Objective:	To provide affordable wastewater treatment that meet the scheme capacity requirements and resource consent conditions.

Key wastewater treatment issues are:

- The nitrogen discharge limits for wastewater discharged to the Lake Taupo Catchment (WRC Variation 5).
- The ability of WWTP and disposal systems to meeting resource consent requirements.
- Decrease in allowable nutrient loading rates for land disposal systems.

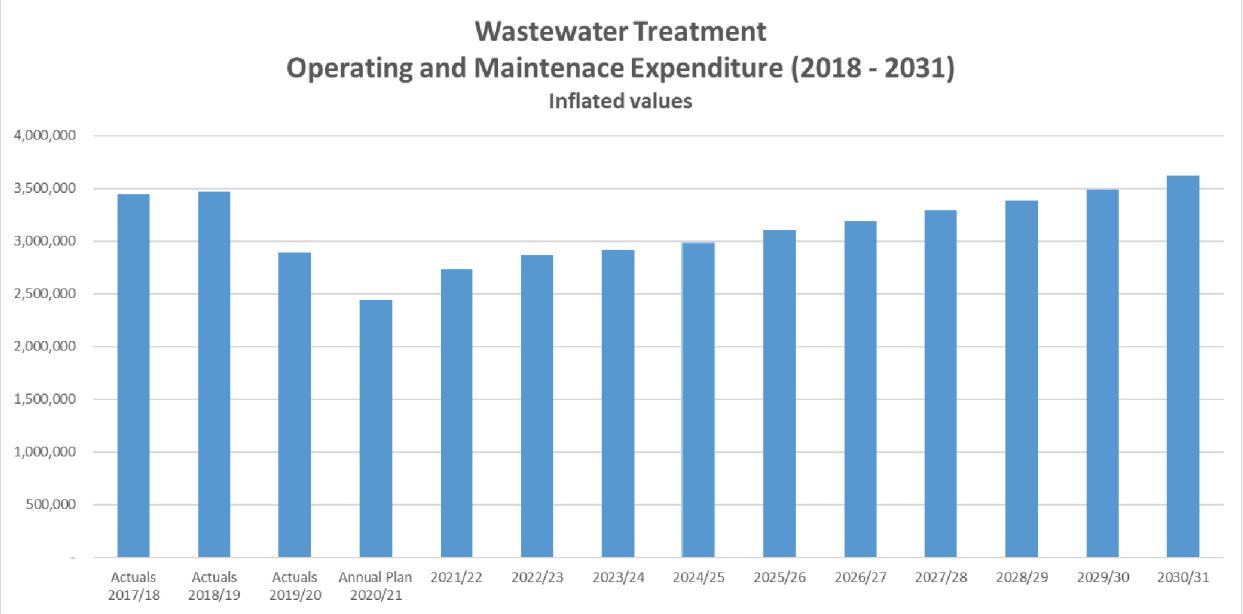
8.3.1.1 Treatment Plant Operations and Maintenance

Maintenance is carried out on treatment plants to ensure that the levels of service outlined in the Level of Service section of this document and effluent discharge consent conditions are met. A summary of the additional operating costs due to changes in demand and consent conditions is included in Section 6, with a full financial summary in Section 9.

The treatment plants are operated by TDC operators and the maintenance is mostly carried out internally by a maintenance team. Specialist maintenance such as equipment calibration, probe maintenance, electrical and telemetry works are carried out by specialist contractors.

Each treatment plant has operational procedures and management plans.

Historical and Projected Treatment Operation and Maintenance is shown below.



Note: Opex expenditure shown do not include, overhead cost, financial cost, interest (loans), depreciation etc.

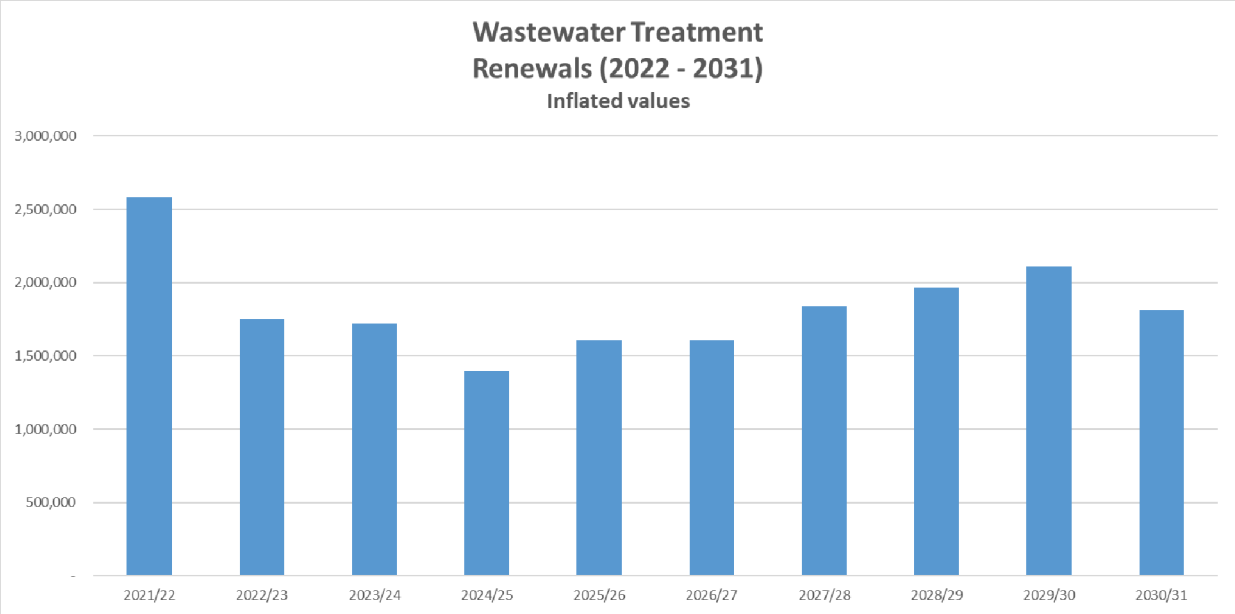
8.3.1.2 Treatment Plant Renewal

Renewal expenditure is work that restores an existing asset to its original capacity or the required condition. By renewing plant equipment as required the quality level of service is met. Where assets become surplus to requirements or no longer meet the required level of service, they are renewed and the existing asset is removed either used in other schemes or sold as surplus where possible or disposed of, which occurs normally at the end of useful life.

Over the last three years more information has been obtained which in term enables a more detailed renewals programme to be developed. Undertaking renewals at the identified time will ultimately reduce the reactive maintenance, spillages and renewal spending enabling better budget planning with reduced unbudgeted spending.

The renewal programme is prepared through condition rating of the above ground assets – this information is currently stored in an excel file in objective and is updated as required with no more than three years between condition rating and review.

Renewals work for each treatment plant is grouped to together for the respective financial year. If an unexpected renewal is required, the lesser prioritised renewal (or renewals) is deferred till the next year. A summary of the treatment renewals is given below.



8.3.1.3 Treatment Plant Creation

The section covers strategies for the creation of new assets (including those created through subdivision and other development) or works which upgrade or improve an existing asset beyond its existing capacity/performance in response to changes in capacity requirements, legislation or influent quality.

Table: New Treatment Works Capital Budget (non-inflated values)

Project Name	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Acacia Bay WWTP - Instrument and control system upgrade	0	0	0	0	0	0	0	100,000	0	0
Atiamuri WWTP Upgrade	50,000	350,000	0	0	0	0	0	0	0	0
Kinloch wastewater TP MBR (formerly balance tank)	9,000,000	0	0	0	0	0	0	0	0	0
'Kinloch wastewater MBR upgrade - Second reactor	0	0	0	0	0	0	0	50,000	1,000,000	0
'Mangakino wastewater WWTP Upgrade	0	0	0	100,000	1,800,000	0	0	0	0	0
Motuoapa wastewater instrument and control systems upgrade	0	0	0	0	0	0	0	100,000	0	0
Motutere wastewater TP capacity upgrade	0	0	500,000	0	0	0	0	0	0	0
Taupo wastewater - Improved WWTP Resiliance (overflow risk reduction)	100,000	0	0	750,000	0	0	0	0	0	0
Taupo wastewater - Irrigation expantion (new land area)	0	0	0	0	0	0	7,000,000	0	0	7,000,000
Taupo wastewater - WWTP Primary Clarifier 3	0	0	200,000	1,900,000	0	0	0	0	0	0
Taupo wastewater irrigation UV disinfection, effluent filtration and transfer pump station capcity increase	2,600,000	2,600,000	0	0	0	0	0	0	0	0
Turangi wastewater - Disposal system improvement	0	0	0	0	0	0	250,000	750,000	7,500,000	7,500,000
Whereroa wastewater - WWTP Irrigation expansion	0	0	0	0	0	0	0	230,000	0	0

8.3.1.4 Treatment Plant Asset Disposal

In general where assets become surplus to requirements or no longer meet the required level of service, they are renewed and the existing asset is removed; either used in other schemes or sold as surplus where possible or disposed of, which occurs normally at the end of useful life.

RETICULATION AND PUMP STATIONS

Overall Objective:	To convey wastewater from houses and businesses to the wastewater treatment plants without the wastewater spills.

Key issues relating to the pipes and pump stations are:

- Blockages due to the fat build up
- Damage of pipes through ground instability
- Failure of key equipment within pump stations
- Discharges to lakes or river as a result of asset failure
- Limited capacity during peak flow periods for some assets
- Groundwater and stormwater infiltration into the system.
- Individual scheme information is included in the appendices.

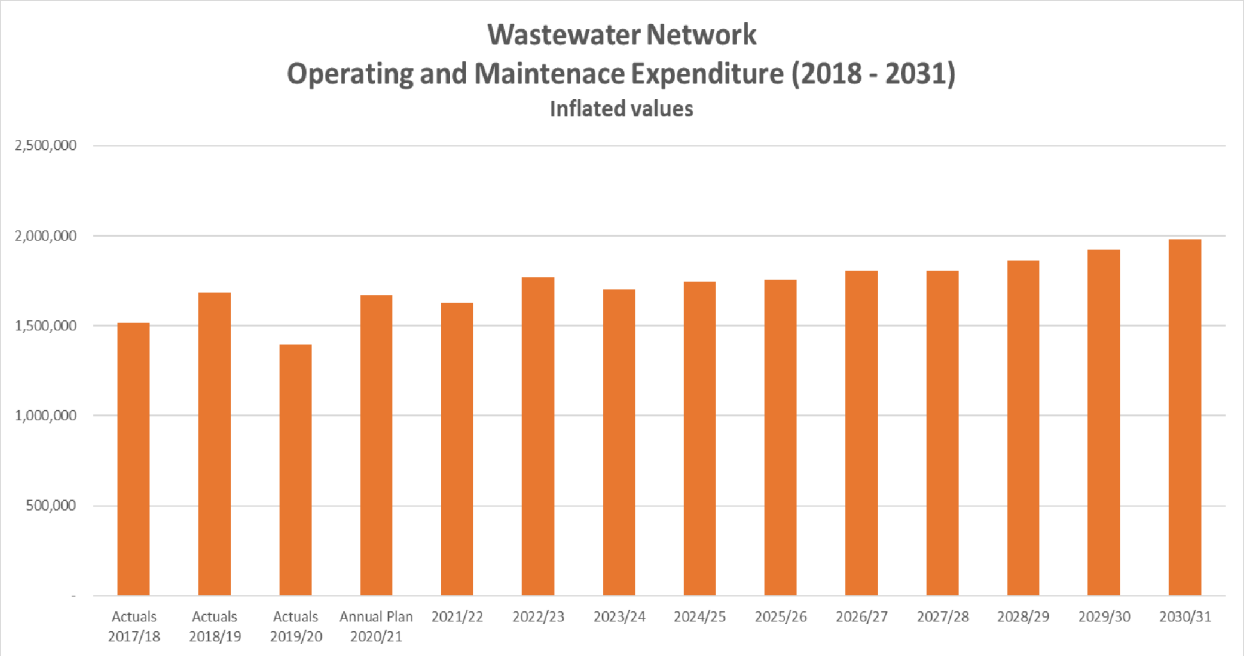
8.3.1.5 Network Operations and Maintenance

-

The network is maintained under the maintenance contract. Some specialist maintenance such as equipment CCTV, pipe lining or renewals and electrical renewals works are carried out by specialist contractors. The Three Waters maintenance contractor routinely manages inspection and cleaning of septic tanks, sewer pump stations, that discharge directly to the treatment plants as this sewerage network is hugely affected by root intrusion, rags and fat build up, which causes the spillages / overflows. The proactive maintenance reduces the amount of localised spillages / overflow incidents from block sewer/ manhole.

Council undertakes network condition assessment by way of analysing the KPI of the three waters maintenance contract. The contractor undertakes CCTV works for the sewerage network as well as regular inspections of manholes systems, this report data along with service requests are then collated and analysed for future maintenance and renewal requirements.

Council operates an electronic service request system that links directly with the three waters maintenance contractor. The public can access this system through Councils fix my street/ application on the website and phone caller's information is placed directly into the service request. Service requests have response times and ramp through the Council hierarchy if not completed on time.



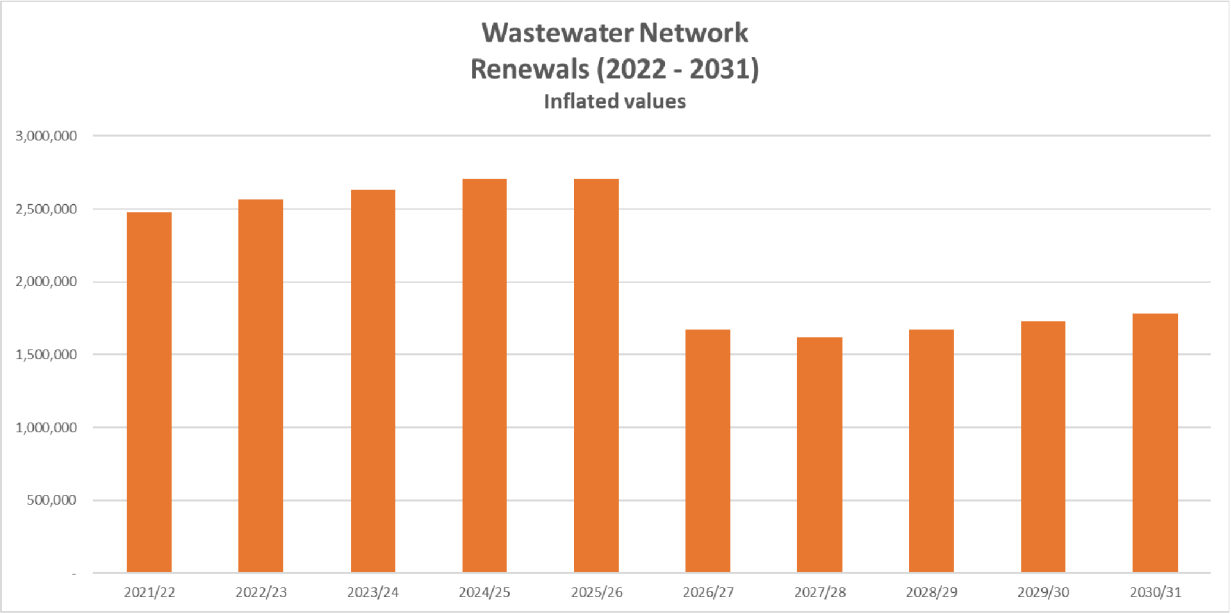
Note: Opex expenditure shown do not include, overhead cost, financial cost, interest (loans), depreciation etc.

8.3.1.6 Reticulation and Pump Station Renewal

Most renewals are due to sewer main issues, overflows, pump or valve failure in the case of reactive renewals or planned renewals based on condition rating provided by the network maintenance staff /contractors. Council has adopted a service level for the network but will not retrospectively upgrade the network unless there is a known serious network spillages /overflow to lake / waterways issue. To understand the current network capacity and identify the under-capacity areas that are causing problems, the maintenance contract and service requests are analysed. Future developments are funded by developers who must increase the capacity of the downstream network if their development requires additional capacity.

At this stage in the asset age, majority of renewals are for old sewerage system district wide, sewer manhole restoration, electrical panels and pump station components. The renewal programme for pump stations is developed using condition rating information supplied by the maintenance contractors. A manhole inspection and a CCTV programme have been proposed for inclusion in the operations budget. The first sections of CCTV will be the CBD, Rising Main to Rakaunui Road and the Huka Falls Rising main. It is expected that future pipe renewal work will be identified during this CCTV inspection process and subsequently a future budget will be planned in due course. In the interim a lump sum budget is allowed.

A summary of the 30 years network renewals budget from 2021-51 for district is given in the following chart.



8.3.1.7 Reticulation Asset Creation

There is currently no significant expected reticulation or pump station asset creation that is not growth related. All growth-related information is included in Section 6.

There will be a process of identifying properties that remain on septic tanks and are within reticulated sewer areas. Once the septic tanks are identified TDC will work with the property owners to make connection to the sewer network where practicable. These assets will largely be private with TDC providing the sewer lateral for connection.

Table 8-9: Future Reticulation Capital Expenditure

Project Name	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Taupo wastewater Control gate bridge siphon	750,000	1,000,000	0	0	0	0	0	0	0	0
Taupo wastewater Southern trunk main upgrade	800,000	4,500,000	4,500,000	0	0	0	0	0	0	0
Taupo wastewater - Eastern trunk main capacity upgrade (programme)	0	0	0	150,000	1,110,000	540,000	0	0	0	0
Turangi wastewater - Waihi Village wastewater contribution	1,200,000	0	0	0	0	0	0	0	0	0

8.3.1.8 Resource Consents

TDC have acquired numerous resource consents for the wastewater reticulation and treatment. The table below summarises the consented wastewater discharges for each scheme, along with the date that the consent expires.

The annual resource consent and monitoring costs are included in the operations budget. Any costs associated with applying for new consent (or replacements consents) are budgeted.

Table 8-10: Summary of Wastewater Resource Consents

Resource Consent	EW File Number	Purpose	Location	Expiry Date	Granted Date	Status
930464	60 55 42A	Discharge up to 9000 cubic metres of treated domestic waste on to land and gases and aerosols from sewage treatment and spray irrigations into air at Rakaunui Road	Taupo Urban Sewage - Taupo	31/12/2015	30/08/1994	Expired - replacement consent applied for.
951023	60 55 12A	Discharge up to 1000 m^3/day of treated domestic effluent into the ground per day in the vicinity of Mangakino Reserve, Lake Maraetai.	Mangakino Sewage	30/12/2016	28/01/1997	Expired - replacement consent applied for.
102927	60 55 18A	Discharge treated domestic effluent to the Hangarito Stream & Taupo South wetland	(Turangi Sewage) Awamate Rd - Turangi	23/06/2018	23/06/2003	Expired - replacement consent applied for.
109488	60 01 86A	Discharge up to 64 cubic metres per day of treated municipal sewage effluent into the ground	(Atiamuri Village) SH1 - Atiamuri	1/03/2024	6/05/2004	Current
113402.01	60 55 10A	Discharge up to 1500 m^3/day of treated wastewater from the Kinloch WWTP to various disposal sites in the Kinloch are	(Kinloch Sewage) Kinloch	31/01/2039	22/01/2014	Current (modified by s127)
113402.02	60 55 10A	Discharge contaminants to air in association with the operation of the Kinloch WWTP	(Kinloch Sewage) Kinloch	31/01/2039	22/01/2014	Current
116596	60 55 42A	Discharge up to 15,000 cubic metres per day of treated wastewater from the Taupo Pollution Control Plant to land via surface irrigation, and associated discharges to air	Taupō Urban Sewage (Taupō)	31/12/2032	11/03/2008	Current
121289	60 55 42B	Discharge contaminants to air (odour) arising from the storage, transfer, treatment and disposal of liquid and solid waste, the production and collection of biogas, and operation of a standby diesel generator in the vicinity of the Taupo Wastewater Treatment Plant	Rickit Street, Taupo	31/12/2032	7/10/2010	Current
122515	60 55 30A	Discharge up to 500 cubic metres per day of treated wastewater to ground from the Motuoapa SBR wastewater plant.	Parekawa Drive - Motouapa	13/11/2033	13/11/2013	Current
122517	60 55 30A	Discharge contaminants to air in association with the operation of an SBR wastewater plant Treatment Plant	Parekawa Drive - Motouapa	13/11/2033	13/11/2013	Current
122518	60 55 06A	Discharge up to 920 m^3/day of treated wastewater to land	Acacia Bay Road, Taupō	25/10/2035	15/10/2015	Current
122519	60 55 06A	Discharge contaminants to air from a wastewater treatment plant	Acacia Bay Road, Taupō	25/10/2035	15/10/2015	Current
130354	60 01 88A	Discharge treated municipal wastewater to land and contaminants to air from the Whakamaru WWTP	Whakamaru Village Pokuru Road Whakamaru	31/05/2036	24/05/2016	Current
135810	60 54 69A	Discharge treated domestic wastewater from the Omori, Kurutau and Pukawa communities to land	Morunga Street - Omori	31/03/2044	11/03/2019	Current
135813.01.01	60 55 28A	Discharge treated domestic wastewater from the Motutere community on to land	SH1 - Motutere	30/06/2040	2/07/2020	Current
135813.02.01	60 55 28A	Discharge contaminants to air from Motutere WWTP	SH1 - Motutere	30/06/2040	2/07/2020	Current
138347	60 54 64A	Discharge treated municipal wastewater to land and contaminants to air from the Whareroa WWTP	Whareroa Road - Whareroa	31/01/2039	31/01/2019	Current

9.0 FINANCIAL SUMMARY

9.1 Process of Determining Financial Forecast

The provisional 30-year financial forecast for wastewater was determined by identifying new works, and the continuation/evaluation of current maintenance and renewal strategies within each of the components, i.e. reticulation and treatment plants. Changes to the operations (OPEX) and capital projects (CAPEX) expenditure for items within each of the asset types were generally due to maintaining current level of services and increased contract rates.

Level of service consultation carried out in 2005 indicated the community were generally satisfied with Councils current spending within the various asset groups. This feedback was also used when determining provisional budgets. Refer to Table 9.4 for the 10-year financial forecasts for both OPEX and CAPEX budgets.

Council uses the following strategy:

- Assign realistic timing to projects given the resources available under Councils current funding sources and in relation to impacts in other Asset Management Plans
- Optimise timing of projects
- Generate consistent budgeting philosophies across all Council divisions
- Align expenditure with growth predictions

Consultation on the final 10-year financial forecast has been carried out via the LTP process.

9.1.1 IMPLICATIONS OF CHANGES BETWEEN DRAFT AND FINAL BUDGETS

The following changes have been made from draft to final budgets:

<u>Taupo Wastewater</u>

The project budget for, '*Taupo wastewater irrigation UV disinfection, effluent filtration and transfer pump station capacity increase'* has been pushed out 1 year due to uncertainty in resource consent conditions still be received and also allowing time for more project feasibility work to be completed. Budget timing is now $200,000 Yr1, $2,400,000 Yr2, $2,600,000 Yr3.

<u>Motutere WWTP Upgrade + Motutere Point Reticulation</u>

$400,000 has been added to Yr4 to allow reticulation of Motutere Point wastewater and to connect this to the WWTP. The timing of the WWTP upgrade has been modified to align with this project. Budget timing is now $100,000 Yr3, $500,000 Yr4 for the WWTP upgrade and $400,000 Yr4 for reticulation of the point community.

9.2 Funding of Expenditure

9.2.1 FUNDING STRATEGY

The focus of this AMP is to identify the optimum (lowest lifecycle) cost for the wastewater and to identify the cost for each asset group necessary to produce the desired level of service. How this cash flow will be funded is outlined in Council's long-term financial strategy.

Current funding sources available for wastewater include:

- Rates – income generated by the collection of general, separate and differential rates.
- One off capital contribution – contributions made by individual developers for projects that are of particular benefit to them that are being constructed by TDC.
- Development Contributions – contributions made by developers under the Local Government Act 2002.
- Private (developer) funded works – projects completely built and funded by developers where ownership is handed over to TDC on completion (vested assets).
- Connection Fees.
- Interest on general funds.
- Fees and charges (ref Annual Plan for current Fees & Charges).

9.2.2 ALLOCATION OF FUNDS

The process of allocating funds is generally based on:

- Maintenance and operations are funded from General Rates.
- Renewal works are funded by Depreciation. Depreciation is calculated using either the straight line or the diminishing value method to allocate their cost or revalued amounts, net of their residual values, over their useful lives.
- New Works are funded by either or a combination of Development Contributions, Loans, Individual Contributions (e.g. underground power) and Depreciation (if it has not all been used for Renewal Works).

The funding strategy can be found within the Long-Term Plan.

9.3 Historical and Forecast Expenditure

Detailed historic expenditure for each asset group is included within the lifecycle section for that asset. Budgeted wastewater expenditure for the next 10 years is summarised on the following pages. The capital expenditure due to changes in demand is documented in section 6.5.2.

The AMP group is collectively working through the Waugh report recommendations, particularly the 0 and 1 scores, to bring all AMPS up to the core level. Any other recommendations not completed during the updated AMP process cycle are added to the Improvement plan with dates etc. which can be monitored.

9.3.1 OPEX: OPERATING AND MAINTENANCE EXPENDITURE

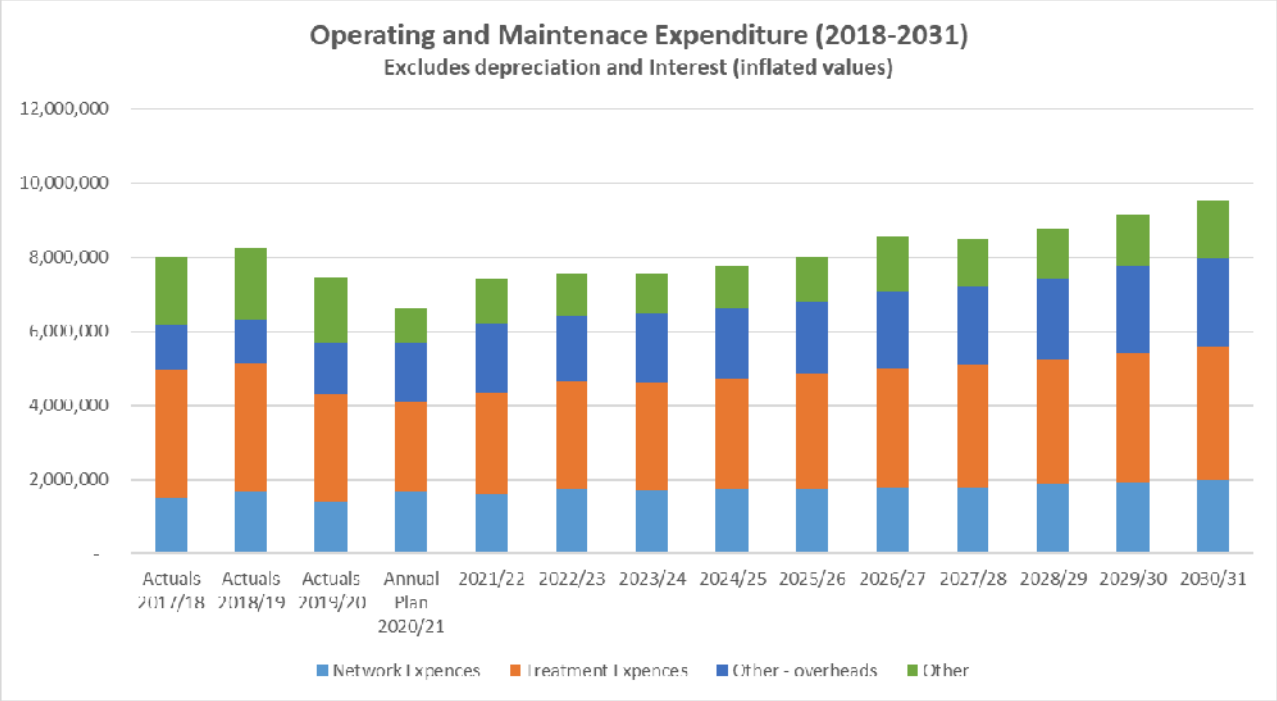


FIGURE 9-1: OPERATING AND MAINTENANCE EXPENDITURE

The maintenance is carried out by contractors who are appointed in accordance with Council's procurement policy.

9.3.2 OPEX: INCOME

Operational income is generated from the sale of haylage from the Rakaunui Road and View Road sites.

9.3.3 CAPEX: RENEWAL EXPENDITURE

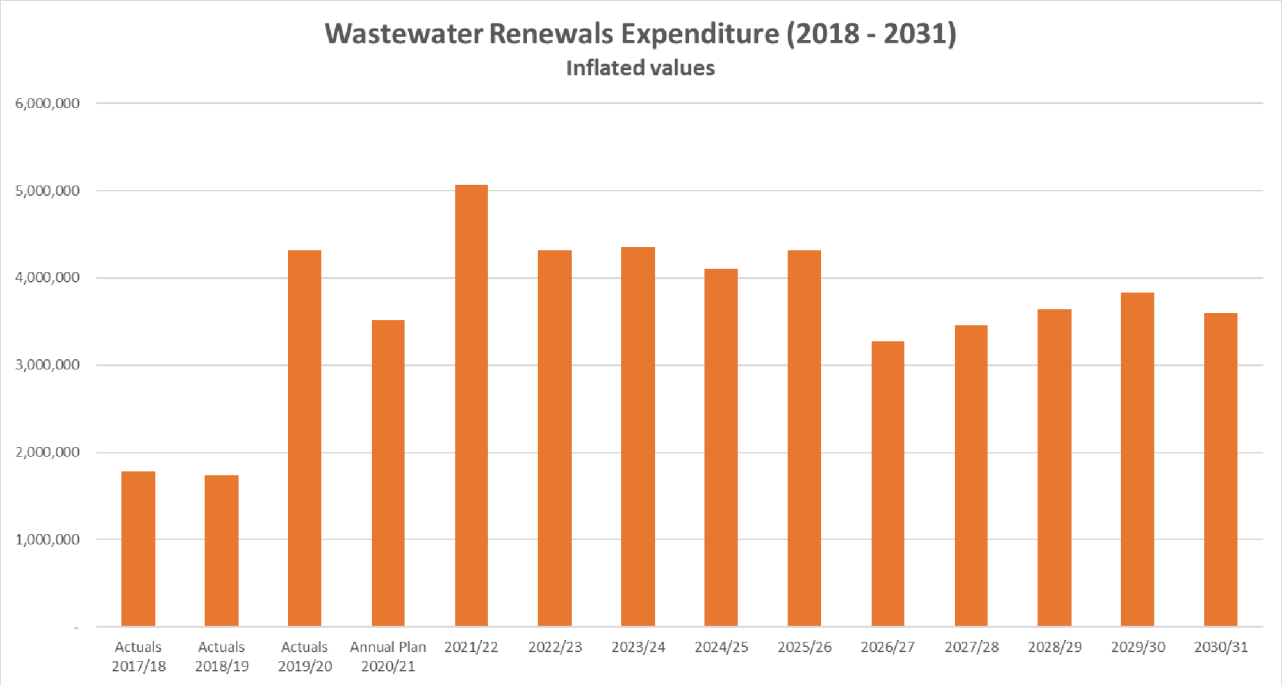


Figure 9-2: Renewals Expenditure

Renewals include any items where an existing asset is replaced for example pumps or manhole rehabilitation etc. Renewal costs fluctuate year to year as assets with different expected lives reach the end of their useful lives and need renewing or replacing.

Generally, the timing of renewal for an asset is based on assessment as the asset is nearing the end of its useful life. Loss in service potential is calculated by straight-line depreciation with the exception of land which is not depreciated. The depreciation rates are applied at a component level and are dependent on the remaining useful life of each component. The total useful lives have been updated and are loaded in to Asset Finda.

Table 9-1: Wastewater Asset Useful Lives

Component	Useful Life (years)
Manholes	80
Lamp holes	50
Pipe – Asbestos Concrete	65
Pumps	15
Valves	Various
Wet wells and Storage Chambers	100
Pipe – PVC	80
Pipe – Concrete	80
Control Equipment	15
Telemetry Equipment	15

A summary of the depreciation of wastewater assets is presented in the Taupo District Council Annual Report.

The renewal plan section of the scheme appendices outlines renewals required for each scheme. Refer to project sheets.

9.3.4 CAPEX: NEW WORKS EXPENDITURE

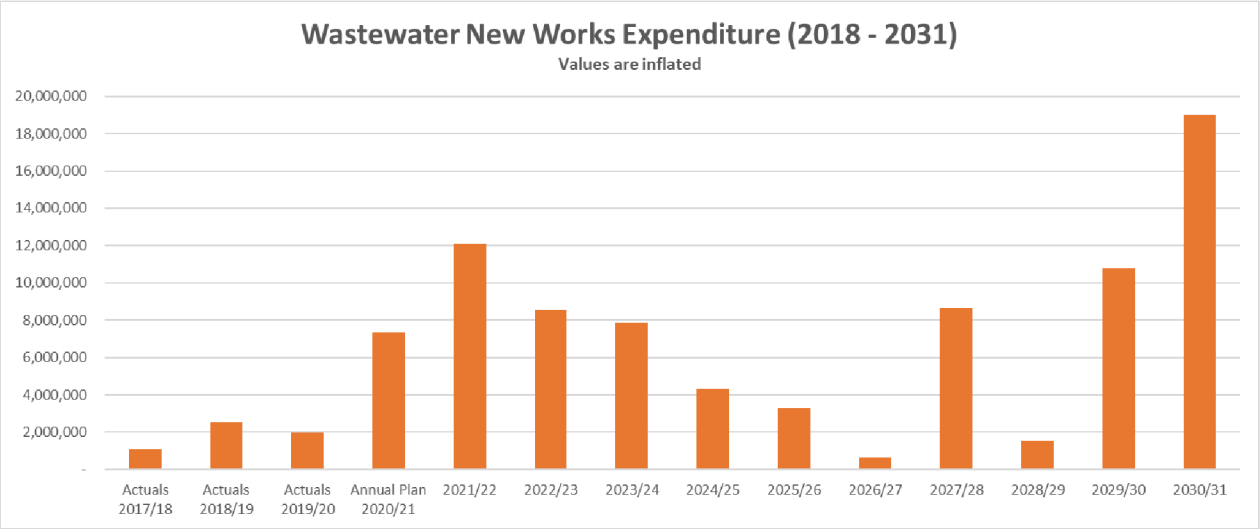


Figure 9-3: New Works Expenditure

New works expenditure is governed by works required to meet resource consent requirements and growth. Structure Planning documents have been and will continue to be used to support the assessment of future expenditure.

9.3.5 CAPEX: DISPOSAL

The Waitahanui wastewater treatment plant is no longer in use and assets that could not be reallocated have been disposed of. There is no forecast asset disposal for wastewater at this time.

9.3.6 EXPENDITURE LINKAGES TO LEVEL OF SERVICE

The linkage to the level of service for each project is detailed on the individual project sheet.

9.4 Total Expenditure and Funding

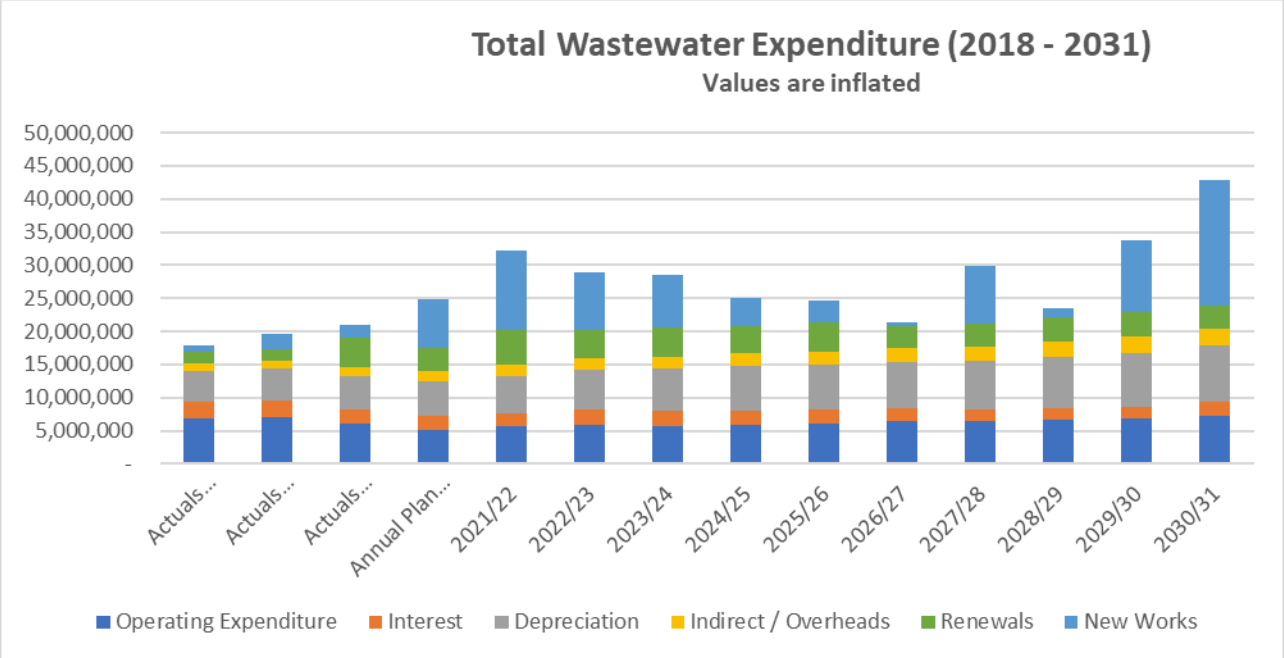


Figure 9-4: Total Expenditure

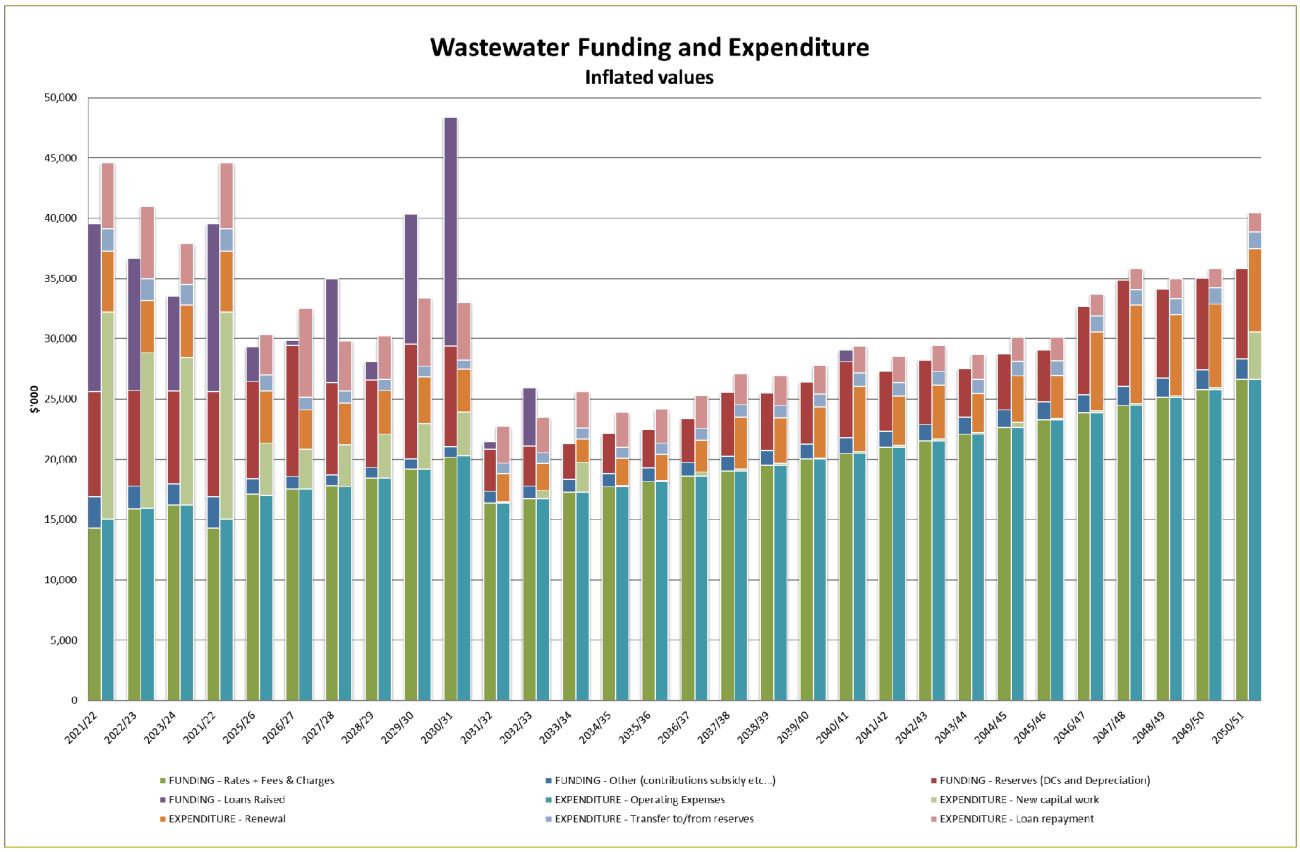


Figure 9-5: Wastewater Funding and Expenditure

9.5 Valuation of Wastewater Assets

Wastewater assets provide a continuing service to the community and are not generally regarded as tradable. The cost to replace an asset with the Modern Equivalent Asset (MEA) is used as a basis to determine replacement value. This AMP is being updated with the latest Asset valuations of August 2020.

Refer to Section 4 (Asset Data), for a summary of the valuation of wastewater assets. A full valuation report is available on request.

9.6 Financial Assumptions

The following financial assumptions have been made. Further information can be found in the LTP document.

- Asset Revaluations completed 2017 have been used as the basis for asset values and have been inflation adjusted.
- Development Contributions Income is assumed to eventuate as predicted.
- Investment Returns eventuate as predicted.
- Interest Rate on borrowings remains as predicted within the financial model.
- Expenditure of capital projects occurs, and estimated debt levels are as predicted.
- No allowance has been made for inflation adjustment within this AMP. The source of funds for the future replacement of significant assets is stated in the revenue and Financing Policy.
- The useful lives of significant assets are as per the accounting policies documented in the LTP. Depreciation is charged at 50 % for the first year and 100 % in subsequent years.
- Development Contributions will continue to be collected.
- Assume that the revenue received from Rates is as per expected.

9.7 Financial Confidence Levels

The confidence in the asset data used as a basis for the financial forecasts has been assessed using the following grading system from the International Infrastructure Management Manual – Australia/New Zealand Edition, April 2000.

Table 9-2: Confidence Grading Table

Confidence Grade	General Meaning
A	Highly reliable. Data based on sound records, procedure, investigation and analysis, documented properly and recognised as the best method of assessment
B	Reliable. Data based on sound records, procedures, investigation and analysis, documented properly but has minor shortcomings, for example the data are old, some documentation is missing, and reliance is placed on unconfirmed reports or some extrapolation.
C	Uncertain Data based on sound records, procedure, investigation and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data are available
D	Very Uncertain. Data based on unconfirmed verbal reports and/or cursory inspection and analysis.

The confidence level is B+ overall. The financial cost within the first 3 years is seen as reliable with reliability decreasing with time. Also, reliability depends on the phase of project with reliability increasing as project moves from scoping to construction.

Scoping	Increasing Reliability ↓
Investigation	
Design	
Construction	

Table 9-3: Financial Table (inflated) for the 30 Years 2021-2035 ($,000)

	Annual Plan 2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35
Operating Income															
General rates	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Targeted rates	-13,111	-13,339	-13,434	-13,521	-13,700	-14,008	-14,150	-14,111	-14,289	-14,573	-14,875	-15,242	-15,714	-16,132	-16,508
Capital subsidies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Development and/or financial contributions	-616	-1,011	-983	-930	-797	-853	-797	-797	-611	-611	-626	-641	-658	-674	-691
Vested assets	-602	-736	-758	-723	-598	-634	-629	-709	-527	-525	-538	-552	-566	-580	-594
Fees and charges	-1,370	-1,399	-1,432	-1,466	-1,502	-1,540	-1,580	-1,621	-1,664	-1,711	-1,754	-1,797	-1,842	-1,888	-1,936
Total Income	**-15,700**	**-16,485**	**-16,606**	**-16,640**	**-16,597**	**-17,035**	**-17,155**	**-17,238**	**-17,091**	**-17,419**	**-17,793**	**-18,232**	**-18,779**	**-19,274**	**-19,728**
Operating Expenses															
Network Expenses	1,627	1,772	1,702	1,748	1,754	1,803	1,801	1,860	1,924	1,983	2,032	2,083	2,135	2,188	2,243
Treatment Expenses	2,740	2,865	2,914	2,985	3,104	3,191	3,293	3,380	3,488	3,622	3,712	3,805	3,900	3,998	4,098
Other Operating expenses	1,300	1,097	1,211	1,289	1,480	1,491	1,562	1,507	1,558	1,553	1,678	1,720	1,763	1,807	1,852
Interest	2,587	2,528	2,383	2,149	1,908	1,872	1,684	1,422	1,226	1,168	2,135	2,188	2,243	2,299	2,356
Depreciation	4,978	5,188	5,341	5,502	5,675	5,877	6,074	6,249	6,443	6,643	8,821	9,042	9,268	9,499	9,737
Overheads	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315	2,447	2,508	2,571	2,635	2,701
Total Expenses	**14,547**	**14,764**	**14,866**	**14,987**	**15,235**	**15,548**	**15,729**	**15,732**	**15,953**	**16,284**	**20,825**	**21,346**	**21,879**	**22,426**	**22,987**
Net Deficit (Surplus) of Operations	**-1,153**	**-1,721**	**-1,741**	**-1,653**	**-1,362**	**-1,487**	**-1,426**	**-1,506**	**-1,138**	**-1,136**	**3,032**	**3,113**	**3,100**	**3,153**	**3,259**
Funded by:															
Operating deficit (surplus) from/to reserves	-551	-985	-983	-930	-764	-853	-797	-797	-611	-611	-626	-641	-658	-674	-691
Recognition of vested assets	-602	-736	-758	-723	-598	-634	-629	-709	-527	-525	-538	-552	-566	-580	-594
Depreciation not funded	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Funding	**-1,153**	**-1,721**	**-1,741**	**-1,653**	**-1,362**	**-1,487**	**-1,426**	**-1,506**	**-1,138**	**-1,136**	**-1,164**	**-1,193**	**-1,223**	**-1,254**	**-1,285**
Network Renewals	2,480	2,567	2,634	2,706	2,706	1,673	1,620	1,673	1,730	1,783	997	2,266	1,342	2,453	1,117
Treatment Renewals	2,583	1,752	1,723	1,400	1,609	1,605	1,841	1,967	2,109	1,810	2,080	2,231	2,286	2,343	2,401
Total Renewals	5,063	4,319	4,356	4,105	4,316	3,279	3,461	3,640	3,839	3,593	3,077	4,497	3,628	4,796	3,518
Network New Capital															
Kinloch wastewater TP MBR (formerly balance tank)	9,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
District wide WW Network Renewals	2,480	2,567	2,634	2,706	2,706	1,673	1,620	1,673	1,730	1,783	997	2,266	1,342	2,453	1,117
1718 Taupo wastewater plant renewals	1,559	393	595	491	337	439	822	627	560	275	736	755	774	793	813
Turangi wastewater - Waihi Village wastewater contribution	1,200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Taupo wastewater Southern trunk main upgrade	800	4,658	4,779	0	0	0	0	0	0	0	0	0	0	0	0
Taupo wastewater Control gate bridge siphon	750	1,035	0	0	0	0	0	0	0	0	0	0	0	0	0
1718 Wastewater Operations equipment renewals - KS	270	409	324	333	382	415	328	529	337	754	473	485	497	509	522
Total Network Capital	**16,059**	**9,061**	**8,331**	**3,529**	**3,425**	**2,527**	**2,769**	**2,829**	**2,627**	**2,812**	**2,206**	**3,506**	**2,613**	**3,755**	**2,452**
Treatment New Capital															
1718 Rakaunui & View Rd LDS renewals	260	331	319	229	225	300	250	258	483	249	341	350	359	368	377
Taupo wastewater irrigation UV disinfection, effluent filtration and transfer pump station capcity increase	200	2,484	2,761	0	0	0	0	0	0	0	0	0	0	0	0
1718 Wastewater Operations equipment renewals - KS	135	207	16	24	45	12	71	86	102	105	0	98	101	103	106
1718 Vehicle renewals - KS	114	81	0	41	43	88	0	49	205	50	78	80	82	84	86
Taupo wastewater - Improved WWTP Resiliance (overflow risk reduction)	100	0	0	818	0	0	0	0	0	0	0	0	0	0	0
1718 Wastewater Operations equipment renewals - KS	70	23	53	87	112	144	95	123	165	33	105	108	110	113	116
1718 Wastewater Operations equipment renewals - KS	50	41	32	11	11	40	18	55	13	13	34	35	36	37	38
Atiamuri WWTP Upgrade	50	362	0	0	0	0	0	0	0	0	0	0	0	0	0
1718 Wastewater Operations equipment renewals - KS	42	109	34	24	22	40	60	12	76	33	54	55	57	58	59
1718 Wastewater Operations equipment renewals - KS	30	21	98	16	118	58	101	154	25	125	86	88	90	92	94
Wastewater Operations Equipment Renewals	20	10	0	9	79	0	2	5	0	4	16	16	17	17	17
1718 Wastewater Operations equipment renewals - KS	15	21	117	82	124	46	38	49	32	37	67	68	70	72	73
1718 Septage plant renewals	10	83	27	44	101	12	48	12	102	105	62	64	66	67	69
1718 Wastewater Operations equipment renewals - KS	5	5	80	5	6	12	6	6	9	26	19	20	20	21	21
1718 Wastewater Operations equipment renewals - KS	3	19	30	3	6	0	2	0	0	3	8	8	9	9	9
Taupo wastewater - WWTP Primary Clarifier 3	0	0	212	2,073	0	0	0	0	0	0	0	0	0	0	0
Motutere wastewater TP capacity upgrade	0	0	106	546	0	0	0	0	0	0	0	0	0	0	0
Moturere Point reticulation	0	0	0	436	0	0	0	0	0	0	0	0	0	0	0
Total Treatment New Capital	**1,104**	**3,796**	**3,884**	**4,449**	**891**	**751**	**692**	**811**	**1,212**	**781**	**871**	**991**	**1,015**	**1,040**	**1,066**
Total New Capital	**17,163**	**12,858**	**12,215**	**7,978**	**4,316**	**3,279**	**3,461**	**3,640**	**3,839**	**3,593**	**3,077**	**4,497**	**3,628**	**4,796**	**3,518**
Total Capex & Renewals	**22,226**	**17,177**	**16,571**	**12,084**	**8,631**	**6,557**	**6,922**	**7,279**	**7,678**	**7,187**	**6,154**	**8,994**	**7,257**	**9,592**	**7,036**
Funded by:															
Loans Raised	4,255	1,845	892	1,797	3,047	3,745	81	499	1,963	764	672	4,823	0	0	0
Less Loan Repayments	-3,303	-3,324	-3,708	-7,839	-2,991	-4,226	-3,109	-2,978	-2,610	-2,182	-3,050	-2,955	-3,030	-2,908	-2,792
Development and/or financial contributions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transfer from reserve(s)	6,142	6,500	7,320	10,373	4,835	6,110	5,096	5,350	4,795	4,451	6,127	7,452	6,658	7,704	6,310
Total Funding	**7,094**	**5,021**	**4,504**	**4,331**	**4,891**	**5,628**	**2,068**	**2,870**	**4,148**	**3,034**	**3,749**	**9,320**	**3,628**	**4,796**	**3,518**

Table 9-4: Financial Table (inflated) for the 30 Years 2036-2050 ($,000)

	2035/36	2036/37	2037/38	2038/39	2039/40	2040/41	2041/42	2042/43	2043/44	2044/45	2045/46	2046/47	2047/48	2048/49	2049/50
Operating Income															
General rates	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Targeted rates	-16,907	-17,315	-17,733	-18,164	-18,611	-19,072	-19,548	-20,041	-20,561	-21,092	-21,633	-22,190	-22,766	-23,359	-24,140
Capital subsidies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Development and/or financial contributions	-708	-726	-744	-763	-782	-801	-821	-842	-863	-884	-906	-929	-952	-976	-1,000
Vested assets	-609	-624	-640	-656	-672	-689	-706	-724	-742	-761	-780	-799	-819	-840	-860
Fees and charges	-1,984	-2,034	-2,084	-2,137	-2,190	-2,245	-2,301	-2,358	-2,417	-2,478	-2,540	-2,603	-2,668	-2,735	-2,803
Total Income	**-20,208**	**-20,699**	**-21,201**	**-21,719**	**-22,254**	**-22,807**	**-23,377**	**-23,965**	**-24,583**	**-25,214**	**-25,858**	**-26,522**	**-27,206**	**-27,910**	**-28,805**
Operating Expenses															
Network Expenses	2,299	2,357	2,416	2,476	2,538	2,601	2,666	2,733	2,801	2,871	2,943	3,017	3,092	3,169	3,249
Treatment Expenses	4,200	4,305	4,413	4,523	4,636	4,752	4,871	4,993	5,117	5,245	5,376	5,511	5,649	5,790	5,935
Other Operating expenses	1,899	1,946	1,995	2,045	2,096	2,148	2,202	2,257	2,313	2,371	2,430	2,491	2,553	2,617	2,683
Interest	2,415	2,475	2,537	2,601	2,666	2,732	2,801	2,871	2,943	3,016	3,092	3,169	3,248	3,329	3,412
Depreciation	9,980	10,230	10,485	10,748	11,016	11,292	11,574	11,863	12,160	12,464	12,775	13,095	13,422	13,758	14,102
Overheads	2,768	2,838	2,909	2,981	3,056	3,132	3,211	3,291	3,373	3,457	3,544	3,632	3,723	3,816	3,912
Total Expenses	**23,562**	**24,151**	**24,754**	**25,373**	**26,008**	**26,658**	**27,324**	**28,007**	**28,707**	**29,425**	**30,161**	**30,915**	**31,688**	**32,480**	**33,292**
Net Deficit (Surplus) of Operations	**3,353**	**3,452**	**3,554**	**3,654**	**3,753**	**3,851**	**3,947**	**4,043**	**4,124**	**4,211**	**4,303**	**4,393**	**4,482**	**4,570**	**4,487**
Funded by:															
Operating deficit (surplus) from/to reserves	-708	-726	-744	-763	-782	-801	-821	-842	-863	-884	-906	-929	-952	-976	-1,000
Recognition of vested assets	-609	-624	-640	-656	-672	-689	-706	-724	-742	-761	-780	-799	-819	-840	-860
Depreciation not funded	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Funding	**-1,317**	**-1,350**	**-1,384**	**-1,418**	**-1,454**	**-1,490**	**-1,527**	**-1,566**	**-1,605**	**-1,645**	**-1,686**	**-1,728**	**-1,771**	**-1,816**	**-1,861**
Network Renewals	1,494	1,824	3,177	2,822	1,713	2,101	2,185	3,967	2,655	4,136	3,433	13,328	2,986	2,506	2,596
Treatment Renewals	2,461	2,522	2,585	2,650	2,717	2,785	2,854	2,925	2,998	3,073	3,149	3,228	3,309	3,392	3,476
Total Renewals	3,955	4,347	5,762	5,472	4,429	4,885	5,039	6,892	5,653	7,209	6,581	16,556	6,295	5,898	6,071
Network New Capital															
Kinloch wastewater TP MBR (formerly balance tank)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
District wide WW Network Renewals	1,494	1,824	3,177	2,822	1,713	2,101	2,185	3,967	2,655	4,136	3,433	13,328	2,986	2,506	2,596
1718 Taupo wastewater plant renewals	833	854	875	897	919	942	966	990	1,015	1,040	1,066	1,093	1,120	1,148	1,176
Turangi wastewater - Waihi Village wastewater contribution	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Taupo wastewater Southern trunk main upgrade	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Taupo wastewater Control gate bridge siphon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1718 Wastewater Operations equipment renewals - KS	535	548	562	576	591	605	621	636	652	668	685	702	719	737	756
Total Network Capital	**2,862**	**3,226**	**4,614**	**4,295**	**3,223**	**3,648**	**3,771**	**5,593**	**4,321**	**5,844**	**5,183**	**15,122**	**4,825**	**4,392**	**4,528**
Treatment New Capital															
1718 Rakaunui & View Rd LDS renewals	386	396	406	416	426	437	448	459	470	482	494	506	519	532	545
Taupo wastewater irrigation UV disinfection, effluent filtration and transfer pump station capcity increase	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1718 Wastewater Operations equipment renewals - KS	108	111	114	117	119	122	126	129	132	135	138	142	146	149	153
1718 Vehicle renewals - KS	89	91	93	95	98	100	103	105	108	111	113	116	119	122	125
Taupo wastewater - Improved WWTP Resiliance (overflow risk reduction)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1718 Wastewater Operations equipment renewals - KS	119	122	125	128	131	135	138	141	145	148	152	156	160	164	168
1718 Wastewater Operations equipment renewals - KS	39	40	41	42	43	44	45	46	47	48	50	51	52	53	55
Atiamuri WWTP Upgrade	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1718 Wastewater Operations equipment renewals - KS	61	62	64	66	67	69	71	72	74	76	78	80	82	84	86
1718 Wastewater Operations equipment renewals - KS	97	99	102	104	107	110	112	115	118	121	124	127	130	133	137
Wastewater Operations Equipment Renewals	18	18	19	19	20	20	21	21	22	22	23	23	24	25	25
1718 Wastewater Operations equipment renewals - KS	75	77	79	81	83	85	87	89	92	94	96	99	101	104	106
1718 Septage plant renewals	71	72	74	76	78	80	82	84	86	88	90	93	95	97	100
1718 Wastewater Operations equipment renewals - KS	22	22	23	23	24	24	25	26	26	27	28	28	29	30	30
1718 Wastewater Operations equipment renewals - KS	9	10	10	10	10	10	11	11	11	12	12	12	12	13	13
Taupo wastewater - WWTP Primary Clarifier 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Treatment New Capital	**1,093**	**1,120**	**1,148**	**1,177**	**1,206**	**1,237**	**1,268**	**1,299**	**1,332**	**1,365**	**1,398**	**1,434**	**1,470**	**1,506**	**1,544**
Total New Capital	**3,955**	**4,347**	**5,762**	**5,472**	**4,429**	**4,885**	**5,039**	**6,892**	**5,653**	**7,209**	**6,581**	**16,556**	**6,295**	**5,898**	**6,071**
Total Capex & Renewals	**7,909**	**8,693**	**11,525**	**10,944**	**8,858**	**9,770**	**10,078**	**13,784**	**11,306**	**14,418**	**13,163**	**33,111**	**12,589**	**11,796**	**12,143**
Funded by:															
Loans Raised	0	0	0	0	1,007	0	0	0	0	0	0	0	0	0	0
Less Loan Repayments	-2,680	-2,573	-2,470	-2,371	-2,277	-2,226	-2,137	-2,051	-1,969	-1,891	-1,815	-1,742	-1,673	-1,606	-1,541
Development and/or financial contributions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transfer from reserve(s)	6,635	6,920	8,233	7,844	6,706	7,111	7,176	8,943	7,622	9,100	8,396	18,298	7,967	7,504	7,613
Total Funding	**3,955**	**4,347**	**5,762**	**5,472**	**5,436**	**4,885**	**5,039**	**6,892**	**5,653**	**7,209**	**6,581**	**16,556**	**6,295**	**5,898**	**6,071**

10.0 ASSET MANAGEMENT PRACTICES

10.1 Current Asset Management Practices

This section outlines the decision-making tools Taupo District Council uses to determine long term maintenance, renewal and creation expenditure for wastewater assets.

Council has had a consultant undertake a review of the three waters asset management plans. This review has enabled asset managers to identify particular areas in the AMP that need to be improved. This outputs from this review process have been placed into the improvement section of the AMP. Also, an Asset management Team has been established to provide group support to the development of AMPs going forward. The AMP Team collectively identify any changes/updates required to the main text and comments are made via spreadsheet before any changes are made to individual AMPS.

Asset Management Plans are compiled by individual asset managers responsible for their assets. Asset Managers are also part of the Asset Management Team who work together to ensure quality outcomes. The team has key relationships with the policy division to make sure that customer expectations are understood as well as key outcomes are achieved. The Finance team also assist in the preparation of finance section. Project information as well as overall budgeting is then passed to senior management to enable further analysis as well as support. Asset management plans are then presented to Council where further prioritisation occurs.

Asset Management practices fall under three broad headings:

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. The Council now seeks a solution and planning to replace the existing AMS system that can meet needs of today and future proof asset management in the future.

Data: Data available for manipulation by information systems to produce the required outputs.

10.2 Asset Management Processes

10.2.1 ATTRIBUTE DATA COLLECTION AND VALIDATION

Data collection is completed by:

- Treatment Plant operations staff
- Wastewater maintenance contractors and Network Engineer(s) providing updated asset information as maintenance works are completed.
- Contractors supplying data where an asset is renewed or installed
- As built data from new subdivision works

Validation is completed by way of TDC auditing a number of contractor's work sheets.

10.2.2 NEW DEVELOPMENT APPROVALS/AS-BUILT RECORDS

The Development Engineer approves completed works and ensures that the following people are issued a copy of all final documents, e.g. plans, pipe and manhole testing results.

- GIS – via the GIS help desk email address
- Utility Asset Officer (who will discuss any issues with the Asset Manager if required).

10.2.3 PROCUREMENT

Council is currently in the process of developing a Procurement Manual for IPG. This document provides instruction regarding Council procurement and tender evaluation methods.

10.2.4 LEVEL OF SERVICE CONSULTATION

The level of service consultation provides feedback from residents and ratepayers of the Taupo District. The responses from this consultation provide input into how the asset is managed. More information can be found in section 5.

10.2.5 INFORMATION FROM CONTRACTORS

Processes for collection of data (maintenance, condition, new assets, renewals, performance etc) clearly defined and efficiently administered through asset maintenance contracts.

10.2.6 STANDARD OPERATING PROCEDURES

Standard Operating Procedures are being developed to assist in the operation and maintenance of assets. This process is ongoing with new procedures being developed as the need arises and updates being made as required.

10.2.7 ASSET MANAGEMENT ACCOUNTING AND ECONOMICS

Council uses a renewal accounting system. The asset management renewal and capital expenditure policy are included as Appendix A.

Infrastructure assets are those public facilities which provide for the delivery of services and sustained standard of living. They primarily comprise the Council's fixed utility systems including roads, streets and footpaths, the water and sewerage reticulation systems, the stormwater system, bridges and culverts.

Infrastructure assets are deemed to have the following attributes:

- they are large networks constructed over several generations;
- they have very long useful economic lives;
- they have a high initial cost;
- they provide a benefit and/or a social service rather than a commercial service, i.e. the assets are used by or for the community as a whole, servicing all the City's residents and visitors The assets are not usually capable of subdivision for ready disposal, because of legal or other restrictions, and consequently are not readily disposable within the commercial marketplace;
- assets are not normally depleted as their service capability is fully maintained in perpetuity, i.e. they are expected to have an indefinite life if adequately maintained although portions of the network will be replaced from time to time.

Assets are systematically evaluated as required, approximately every three years.

Depreciated replacement cost is calculated having regard to an allowance for the expired portion of the expected useful economic life for each category of infrastructure asset.

TDC uses the principles of accrual accounting to measure costs of services provided and recognise revenues.

Renewal accounting treats all upgrading, reconstruction, renewal and renovation work which does not increase the capacity or service potential of assets as operating expenditure.

Operating expenditure can be divided into two broad categories; normal ongoing day to day routine maintenance works, and those other more infrequent larger projects that upgrade or renew the asset to its previous service potential.

Creation expenditure involves increases in an asset's service potential or the creation of new assets.

All expenditure on infrastructure assets will therefore fall into one of three categories:

10.2.7.1 Routine Maintenance Expenditure

Routine maintenance projects can be expected to display some or all of the following characteristics:

- regular and ongoing annual expenditure necessary to keep the assets at their required service potential,
- day to day and/or general upkeep works designed to keep the assets operating at required levels of service,
- works which provide for the normal care and attention of the asset including repairs and minor replacements,
- minor response type remedial works i.e., isolated failures requiring immediate repair to make the asset operational again.

10.2.7.2 Renewal Expenditure

Work displaying one or more of the following attributes, can be classified as renewal expenditure.

- works which do not increase the capacity or service potential of the asset, i.e. works which upgrade and enhance the assets restoring them to their original size, condition, capacity etc,
- the replacement component of augmentation works which increase the capacity of the asset, i.e. that portion of the work which restores the assets to their original size, condition, capacity etc.,
- the replacement component of a new work which replaces the redundant element of an existing asset,
- reconstruction or rehabilitation components of works involving improvements, realignment and re-grading,
- renewal and/or renovation of existing assets, i.e., restoring the assets to a new or fresh condition.

10.2.7.3 New Works Expenditure

New works expenditure projects displaying one or more of the following characteristics:

- Construction works which create a new asset that did not previously exist in any shape or form,
- Expenditure which purchases or creates a new asset (not a replacement) or in any way improves an asset beyond its original design capacity,
- Upgrade works which increase the capacity of the asset,
- Construction works designed to produce an improvement in the standard and operation of the asset beyond its current capacity.

To the extent that a project results in replacement of an asset caused by physical deterioration, and also provides capacity for increased demand, proportions should be allocated to both creation and renewals on the basis of marginal cost.

It is recommended that the split between creation and renewal expenditure is based on marginal cost. This recognises the full cost of renewing the existing asset to its original service potential is an expense as this expenditure cost does not contribute to improving the asset beyond its original design capacity.

10.2.8 THE LONG-TERM PLAN PROCESS

The Long-Term Plan (LTP) formerly known as the Long-Term Council Community Planning (LTCCP) process considers the community outcomes, statutory requirements, the headline indicators and external pressures to determine what Council can or should be doing to help the community work towards its desired future.

The LTP also contains an action plan that sets out how Council will undertake its strategic goals and details the specific activities, functions and initiatives undertaken in the short term (3 years) and long term (10 years).

The LTP draws on information from other documents including the Asset Management Plans and models it in financial terms over a ten-year horizon.

The LTP is updated every three years with the next LTP being currently developed for the 2021 to 2031 period.

10.2.9 THE ANNUAL PLAN PROCESS

The Annual Plan is an action plan that sets out how Council will undertake its strategic goals and details the specific activities, functions and initiatives undertaken. It is produced in the years when a LTP is not. It will also outline deviations from the LTP.

10.2.10 STANDARDS AND GUIDELINES

In all wastewater works there are standards and guidelines that are available to ensure that Council is following 'best practice'. This includes national standards on pipe laying, onsite wastewater treatment, subdivision and development and the TDC Code of Practice for Land Development.

Whereas Acts and Regulations determine minimum levels of service, standards and guidelines provide the means of compliance with specific levels of service.

10.3 Asset Management Information Systems

10.3.1 ASSET MANAGEMENT SYSTEM

Council used *Asset Finda* Asset Management System that contains the data for Three waters (Water, Wastewater and Stormwater) Assets. This is a new system for TDC and asset data is being transferred into the system over time from various other sources.

10.3.2 GIS

The GIS stores all the spatial data relating to the assets. The data is taken from the AMS.

10.3.3 SERVICE REQUEST SYSTEM

This is the system used by Council to record customer complaints, comments or compliments. The information is entered into the system when a customer calls and the call will be categorised depending the issue. Predetermined Council Staff are tasked with completing these requests in a predetermined timeframe.

10.3.4 ASSET VALIDATION BY CONTRACTORS

Data is collected by maintenance and capital works contractors. This information is then updated in the AMS.

10.3.5 SPM (DEVELOPMENT CONTRIBUTION CALCULATIONS)

Capital works project costing are inputted into SPM along with their respective breakdowns of cost e.g. proportion of the project that is growth, backlog or renewal. The level of Development Contribution (DC's) is then calculated for forward financial planning and income projections.

10.3.6 OBJECTIVE

Objective is Council's electronic document management system. All information relating to Council business is saved in this system for easy retrieval when required. This includes incoming and outgoing correspondence especially emails and letters.

10.3.7 HISTORIAN

Historian is a data management programme that allows viewing of operational data such as daily flows or plant measurements.

10.3.8 WATER OUTLOOK

Water Outlook software is being implemented to enable faster and more accurate reporting of laboratory and *Historian* data.

10.4 Data

10.4.1 ACCOUNTING COST DATA

Cost data for the asset groups are identified in the accounting records.

The work category type (maintenance, renewals, and new works) is identified. Marginal costs are only separately identified for significant works. Minor asset expenditure (traffic controls, service lanes) may not be separately identified.

Visual inspection to verify quantities for payment for routine maintenance and renewal tasks is done by the professional services business unit.

10.4.2 GROWTH MODEL

The growth model is typically updated on a three years basis to reflect changes in development patterns. This model predicts the spread and level of growth within the Taupo District Council Area. This model assists Asset Managers in planning forward works for their respective assets.

10.4.3 ASSET VALUATION

The asset valuation provides a three-yearly update of the value of the Wastewater Asset. The asset valuation for the wastewater assets is undertaken every 3 years. New assets or disposal of assets are taken into account at this time. The valuation process is performed in accordance with generally accepted accounting standards and with NZ local authority asset management practice (NAMS). The process also takes into account reviewing the useful lives of each asset type.

10.4.4 CONDITION ASSESSMENT

Condition assessments are carried out by both contractors and council staff. This process is both formal and informal. Currently all condition assessment information for the wastewater treatment plants is stored in objective as an excel file. Reticulation conditional information is contained within contractor reports that are also saved in objective.

10.4.5 OPERATIONAL DATA

Operational data is available on objective, on site and through Historian.

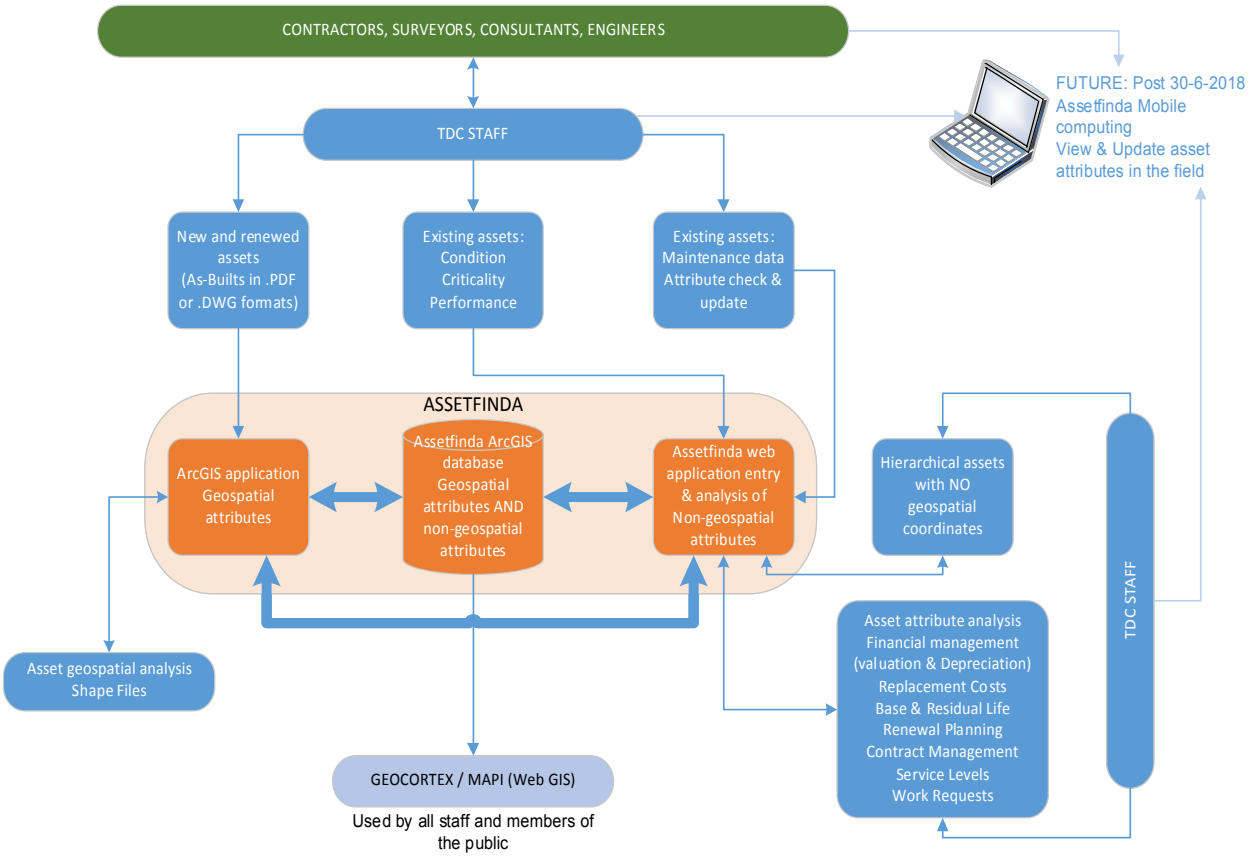


Figure 10-1: Asset Management System / GIS Data Recording Flow

10.4.6 DATA QUALITY ASSURANCE

The following are quality assurance regimes:

- Data Collection:
  - The contractor is responsible for GPS data collection following council standards (council doesn't accept any data with more than 0.3 m error in GPS coordinates).
  - TDC staff is continuously collecting data for historical assets which are updated after verification.
  - Project management team provides as built and field data and advice AMS team to update the information in asset register and or GIS.

- Data entry: Currently council is doing manual entry of the data using ArcGIS import capabilities CAD files and PDF files.

- Data maintenance: This is partially done by council staff whenever the contractor finds any variance in existing data and physical asset in the ground. As regards to the WWTP and pump stations operating staff and contractors' staff are continuously validating and updating the conditions of the asset and informing the AMS team. In future it is envisaged that some efficiency will be developed with upgrade of AssetFinda and field staff will be able to update asset attributes directly and it will be validated using quality assurance protocol developed at that time.

11.0 IMPROVEMENT PLAN AND MONITORING

11.1 Improvement Plan

Improving the management of Taupo District Council's water assets is a continual and on-going process. During the course of updating this plan, asset management improvement tasks have been noted for follow-up over the next three years in conjunction with reviewing and improving this plan. This programme reflects the overall aim of improving asset management practices, which is to deliver the right level of service at the lowest long-term cost to TDC's customers.

The Asset Management Plan was last updated in 2017 to reflect changes in national policy and local thinking.

The Water, Wastewater and Stormwater AMPs were independently peer reviewed in 2018 by Waugh consultants. A number of improvements were identified from these reviews to raise these AMPs from core to advanced, where appropriate.

Waugh report recommendations will be worked through to bring all AMPs up to the core level in all areas. Any other recommendations not completed during the updated AMP process cycle are added to the Improvement plan (section 11.2) with dates which can be monitored.

Audit NZs most recent review was in 2017. Any feedback from Audit NZ on this AMP or AMPs in general is also considered when updating these plans.

Resources (cost and time) have yet to be approved and are only estimates at the time of updating AMP. These may need to be reviewed when task is in progress to judge if timeframe and cost is realistic

Improvement Programme								
Area	Area for improvement	External ref.	Action/task description	Priority	Target date	Cost $	Resource	Status
04	**ASSET DATA**							
	Asset register (AMS)	Waugh review 2018	Lacks demonstration that sufficient and accurate maintenance data appropriate to asset size/value are held.	High	2024 LTP	Internal resource	Asset information Team / Network Engineer	This is a broad statement, detailed lines below to address this point.
	Asset register (AMS)	N/A	Asset inventories for all wastewater pump stations to be included in Asset Management System.	High	2024 LTP	Internal resource	Asset information Team / Network Engineer	Part complete
	Asset register (AMS)	N/A	Asset inventories for all wastewater treatment plants to be included in Asset Management System.	High	2024 LTP	Internal resource	Asset information Team / Network Engineer	Minimal progress
	Asset register (AMS)	N/A	Continue to update valuation data in the AMS with the intention of being able to undertake full valuations through AMS.	High	2024 LTP	Internal resource	Asset information Team / Finance team / Asset manager	Part complete, more work needed on WWTPS and PSs.
	Asset register (AMS)	N/A	Improve asset condition and asset performance data for underground assets (manholes and pipes) in addition to asset age and physical description; to enable better end of life and financial forecasting.	Med	Ongoing	Internal resource	Asset information Team / Operations Manager	Network data being updated with CCTV inspection reports.
	WWTP Management Plans		Update of management plans for wastewater treatment plants (on-going in line with RC applications).	High	Ongoing	Internal resource	Asset Manager	Some recently complete.
	WWTP O&Ms		Review operation and maintenance manuals for wastewater treatment facilities, including P&IDs etc…	High	2022	Internal resource	Asset Manager / Ops manager	Some plants have existing O&Ms, some do not.
	AMP	Waugh review 2018	There is adequate description of assets, but reader understanding will be enhanced if Figure 2 (Table) included scheme, assets, population and replacement value.	Med	2024 LTP	Internal resource	Asset Manager	Include in Asset Data section and also Exec Summary.
	Vested Assets – Subdivisions		Include section in the AMP on new subdivisions/assets gained	Low	2024 LTP	Internal resource	Asset Manager	
05	**LEVEL OF SERVICE**							
	Measurement and reporting		Gauge customer opinion more thoroughly as part of increased consultation.	Med	2021	Internal resource	Policy Team	

Improvement Programme								
Area	Area for improvement	External ref.	Action/task description	Priority	Target date	Cost $	Resource	Status
	Policy	Waugh review 2018	Figure 5.1 identifies the Significance and Engagement Policy but doesn't discuss the Policy or identify whether the Wastewater service is a significant service	Low	2024 LTP	Internal resource	Asset Manager	
	Trending	Waugh review 2018	Section 5.4 discuss satisfaction levels but does not show trending of satisfaction levels. How does the latest results compare with previous surveys?	Low	2024 LTP	Internal resource	Asset Manager	
	Capex links to LoS		Expanding the capital expenditure linkage detail within the AMPs to include linking capital expenditure to demand, maintenance or renewal, in addition to Levels of Service.	Low	2024 LTP	Internal resource	Asset Manager	
06	**FUTURE DEMAND**							
	Growth Model	-	Update growth projections to resolve uncertainties in current data and forecasts.	High	2021/22	Internal Resource	DC Policy Team	Growth model has not been updated since 2017 and is not likely out of date. Growth over the past few years exceeded forecasts.
	Trending	Waugh review 2018	Section 6 Future Demand provides good discussion on Taupō District 2050 (TD2050), the Growth Management Strategy. However, reader understanding would be significantly enhanced if graphs showing forecast population & dwelling growth	Low	2024 LTP	Internal Resource	Asset Manager	Census data 2018 has been slow to be made available but is now being released.
	Trending	Waugh review 2018	The Wastewater AMP demand section may be enhanced by providing the demand figures in graphical form e.g. o Water to Wastewater relationship showing average daily water supplied vs dry weather inflow, current inflow, projected inflow and consented inflow.	Med	2024 LTP	Internal Resource	Asset Manager	Maybe in lifecycle management plans for each scheme
	Forecasting of growth projects	-	Link growth model to the assets that are required with supporting information.	Med	2024 LTP	Internal Resource	Asset Manager	
07	**RISK MANAGEMENT**							
	Critical assets	-	Continue work to better define critical assets in AMS	High	2024 LTP	Internal Resource	Asset Manager	
	Resilience	Waugh review 2018	The risk section can be enhanced through discussion of resilience and referencing 100Resilient Cities website etc	Med	2024 LTP	Internal Resource	Asset Manager	
	Insurance	Waugh review 2018	There is no mention of Council's Policy on Dangerous, Earthquake prone and Insanitary Buildings Policy and how it impacts on water facilities and buildings	Med	2024 LTP	Internal Resource	Asset Manager	
	Insurance	Waugh review 2018	Discuss insurance / risk mitigation etc…. what assets are insured.	Med	2024 LTP	Internal Resource	Asset Manager	Underground assets are not insured. There is some grey area and this needs to be clearly identified.
	Contingency Planning	-	The Wastewater AMP does not show or refer to any contingency plans		2024 LTP	Internal Resource	Asset Manager	BCPs have been developed and need linking into the AMP.

Improvement Programme								
Area	Area for improvement	External ref.	Action/task description	Priority	Target date	Cost $	Resource	Status
08	**LIFECYCLE MANAGEMENT**							
	Renewals planning	-	Develop a reticulation renewals programme that uses condition inspection information rather than age and material only.	High	2024 LTP	Internal Resource	Asset Manager	In progress as more condition data is collected.
	Renewals planning	-	Optimize renewals programmes based on Asset Management principles for reticulation and treatment facilities.	Med	2024 LTP	Internal Resource	Asset Manager / Operations Manager	
	Demand management	Waugh review 2018	Consideration should be given to inclusion of demand management strategies like I/I reduction, response times, renewals, codes of practice, technical standards, standard materials & quality audits	Med	2024 LTP	Internal Resource	Asset Manager	
	Trending	Waugh review 2018	Demonstration of SR, breaks, asset type, maintenance trending etc…	Med	2024 LTP	Internal Resource	Asset Manager	
09	**FINANCIAL SUMMARY**							
	Reliability	Refer section 4.1.1	Though the Council has valuations performed and use the data to inform asset planning, the AMPs do not detail the valuation process.	Med	2024 LTP	Internal Resource	Asset Manager / Finance Team	
	Asset Data Confidence	Waugh review 2018	Section 4.3 provides good description of data confidence i.e. asset data and financial data, but this can be improved upon by distinguishing between above/below ground or reticulation/treatment assets as generally there is a significant difference between data confidence of these asset sets.	Low	2024 LTP	Internal Resource	Asset Manager	
	Sensitivity analysis	-	Sensitivity analysis on financial forecasts	Low	2024 LTP	Internal Resource	Asset Manager	
10	**ASSET MANAGEMENT PRACTICES**							
	Control Environment	AUDIT NZ Refer section 5.4	Including within the AMPs a reference to the "Corporate Activity Plan Framework", and potentially renaming this document to "Asset Management Policy". For consistency purpose renaming not considered.	Low	2024 LTP	Internal Resource	Asset Manager	
	Councillor Input	AUDIT NZ Refer section 1.6.2	Detailing in the AMPs involvement by councillors, including the reviewing and approving of the AMPs.	Low	2024 LTP	Internal Resource	Asset Manager	Also detail SLT review process.
		-	Asset maintenance activities within AMPs are at a very high level and would benefit from greater granularity.	Low	2024 LTP	Internal Resource	Asset Manager / Operations Manager	
	Asset Condition	AUDIT NZ Refer section 10.4.4	Condition assessments are performed, however the condition grading model as per the NAMS IIMM manual is not detailed in the AMPs.	Med	2024 LTP	Internal Resource	Asset Manager	

Improvement Programme								
Area	Area for improvement	External ref.	Action/task description	Priority	Target date	Cost $	Resource	Status
	Asset Data	AUDIT NZ Refer section 4.3 & 10.4.6	The AMPs detail regarding the Council's asset management quality assurance processes to ensure integrity of asset data is too brief in the AMPs.	Med	2024 LTP	Internal Resource	Asset Manager	
11	**GENERAL IMPROVEMENT PLAN & MONITORING**							
		Waugh review 2018	There is no specific section addressing sustainability, but sustainable service provision is dispersed throughout the document.	Low	2024 LTP	Internal Resource	Asset Manager	What Council considers 'sustainable' is not currently defined.
		Waugh Report 2018	The Improvement Programmes show resources (internal/outsource) but doesn't assign specific responsibility to items or estimated time and costs. This undermines the demonstration of commitment to completion of Improvement Items.	Low	2021	Internal time only	Asset Manager	Owners of tasks added however the cost to complete improvements has not been determined.
12	**LIFECYCLE MANAGEMENT SCHEME SPECIFIC**							
	Trending	Waugh review 2018	The Wastewater AMP demand section may be enhanced by providing the demand figures in graphical form e.g. o Water to Wastewater relationship showing average daily water supplied vs dry weather inflow, current inflow, projected inflow and consented inflow.	Med	2024 LTP	Internal Resource	Asset Manager	

Table 11-1: Improvement Plan

11.2 Completed Improvement Plan Tasks

Following is a list of Improvement Plan Tasks that have been completed since the development of the previous Asset Management Plan.

11.3 Opportunities to improve AMPs

Audit New Zealand and Waugh Consultants have provided feedback on the AMP and suggested improvements are tracked above.

Waugh Consultants has presented a spider plot that scores each section of the AMP and suggests a level that should be targeted.

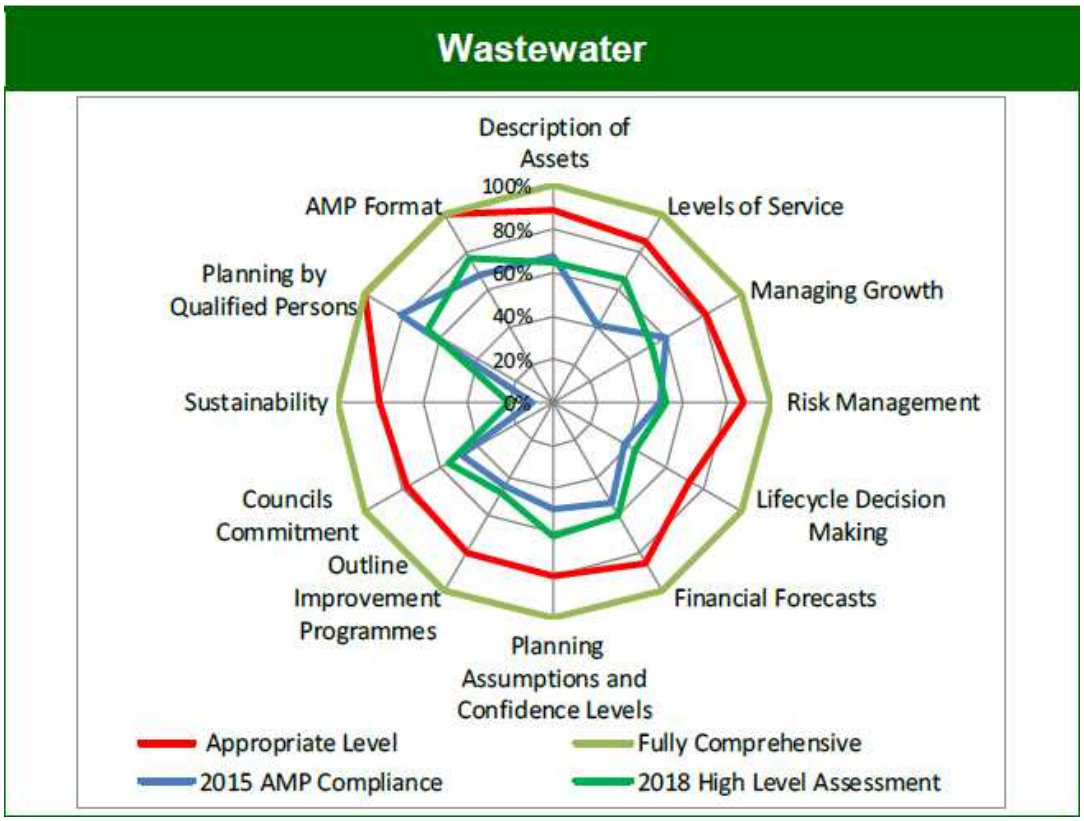


Table 4.2: Overall Average Score per Service

Service	2015	2018
Water	2.85	3.29
Wastewater	2.84	3.31
Stormwater	2.87	3.53
Solid Waste	2.95	3.43
Transport	1.96	3.13
Property	2.60	3.42
Parks & Recreation	2.69	3.34

11.4 Monitoring & Review Procedures

The most important review procedure is the 3-yearly review of the AMP that takes into account asset performance during the previous 3 years and identifies future trends and input into Council's strategic planning process. The 3 yearly cycle of TDC strategic planning is as shown in below.

Year	2016	2017	2018	2019	2020	2021
Activity	Structure planning	Review of asset management plans	LTP amendment	Structure planning	Review of asset management plans	LTP amendment

Figure 1: TDC Three Yearly Planning Cycle

The framework for the 3-yearly review of the AMP in terms of the breadth of considerations is illustrated in the following figure.

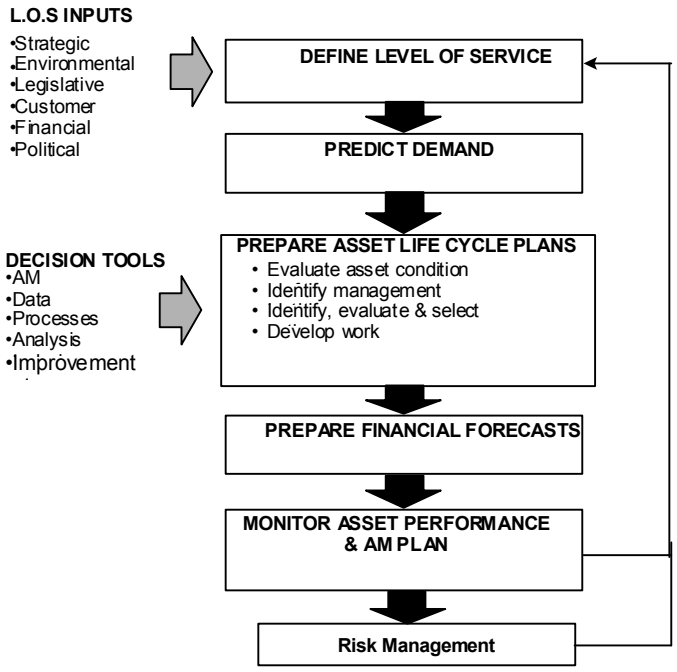


Figure 2: Asset Management Plan Review Procedure

LIFECYCLE MANAGEMENT 7PLANS

Contents

Acacia Bay

ASSET INFORMATION

The Acacia Bay area has been developed progressively since the early 1950's, as a residential settlement and has an increasing population of permanent residents. Roads and streets are all paved and adequate stormwater drainage has been provided but up until the early 80's, septic tanks and soak holes were still in use for wastewater disposal.

Prior to 1986, about 80% of the nitrogen discharged from the septic tanks reached the margins of the lake. The growth in weed and algae slimes along the lake shore was largely attributed to these nutrients.

The wastewater collection network that now serves Acacia Bay includes the existing township of Acacia Bay extending from the lakeshore up to Mapara Road and Whakamoenga Point. The wastewater treatment plant is located off Acacia Bay road.

The sequential batch reactor (SBR) wastewater treatment plant was commissioned in 1986 and it processes the wastewater and provides nitrogen removal.

The current method of disposal for Acacia Bay's treated effluent is by rapid infiltration trench and minor lakeshore effects are suspected.

Through the re-consenting process, Waikato Regional Council has requested that the capacity of the existing disposal system be increased by 25% to meet future failures /demand /growth and this expansion has occurred.

The capacity of the Acacia Bay WWTP is limited and should significant growth occur then connection to Taupō WWTP becomes a viable option. Capacity across the Control Gates Bridge is the limiting factor presently. The Acacia Bay WWTP discharge consent expired in 2035 and this may also be a trigger to connect Acacia Bay to the Taupō wastewater network.

The legal description of the Acacia Bay wastewater treatment plant is given as property pt Rangatira e, sec 5 blk 1 Tauhara sd and the valuation number is 738355800. Map ref NZMS 260 u18 741

The key issues in the management of the sewerage scheme are:

- Population growth (WWTP is near capacity)
- Continued monitoring of the lake shore receiving waters to measure environmental impact.
- Allow for the possible future connection of the community to the Taupo sewer network. This will be required if significant growth occurs in the area.

ASSET DESCRIPTION

The wastewater treatment plant is a sequential batch reactor (SBR) plant. The plant carries out the functions of equalisation, aeration and settling, each tank having five operating modes: fill, react, settle, decant and idle.

The treated wastewater is discharged to soakage trenches adjacent to the wastewater treatment plant for disposal. The disposal of wastewater is measured and monitored. A telemetry system is used to monitor pumps and treatment functions.

A summary of asset replacement valuation (2019/20) is given below:

Scheme	Acacia Bay
Reticulation	$ 5,914,710
Treatment Plant and Disposal system	$ 3,736,256
TOTAL	$ 9,650,966

ASSET CONDITION

The treatment plant was commissioned in September 1986, was upgraded in 1998, 2001 and 2004 and is thus still in good condition.

ASSET CAPACITY/PERFORMANCE

The treatment plant generally operates very well and has a good record of consent compliance.

The rapid infiltration system (soak holes) were repaired and strengthened at certain time intervals in 1996, 2000 and 2003 due to suspected tomo formation. An additional soakage area was installed in 2017 and this provided approximately a 25% increase in soakage area.

Routine testing is carried out weekly to measure influent parameters and effluent quality.

A small spring near the lake edge is monitored and the results show slightly elevated nutrients measured. As a part of the current resource consent application an ecological assessment was completed to assess the level of impact on the lake shore receiving environment. Waikato Regional Council is using this information in the assessment to establish new resource consent conditions.

<u>Operation and Maintenance Plan</u>
Standard operation and maintenance information is provided in Section 8 of this Asset Management Plan.

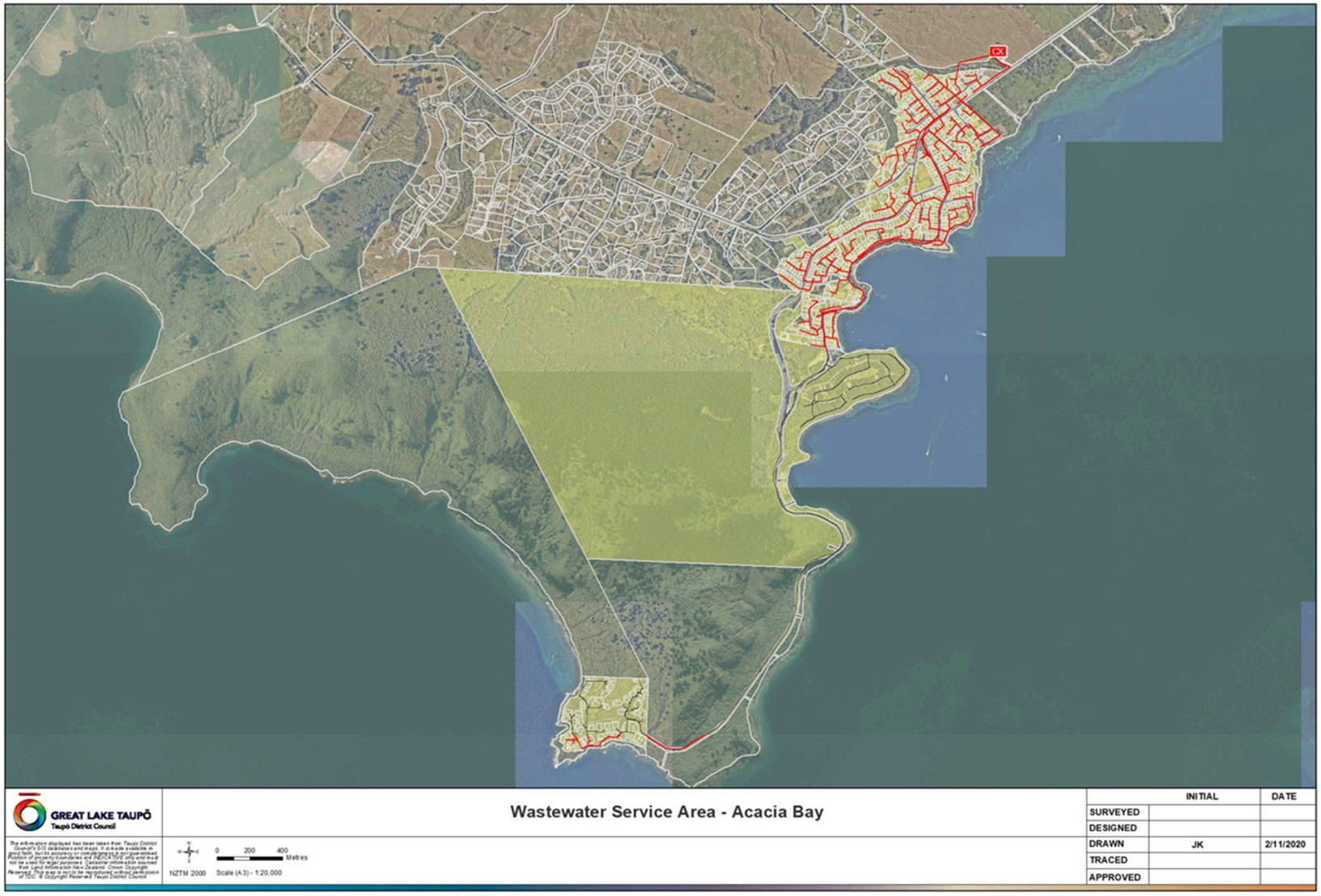
DEVELOPMENT PLAN

Reticulation

No modification, outside of any private development that may occur, is planned for Acacia Bay. There is a significant focus on condition assessment and improving maintenance of the sewer network.

Treatment Plant

There are no significant upgrades planned for the Acacia Bay WWTP. Long-term, should there be any significant growth in the area it is likely that Acacia Bay would connect to the Taupo wastewater network; noting the current constraints at the control gate bridge.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Wastewater Service Area - Acacia Bay
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Atiamuri

ASSET INFORMATION

The Atiamuri Hydro village was built for the Atiamuri Hydro Electric Station staff who worked at the power generating station.

The *Hydro Village* has approximately 35 connections, whose wastewater drains by gravity to the Imhoff Tank on the southern side of State Highway 1. The clarified effluent drains from the Imhoff tank, to a ground soakage trench system while the settled sludge is twice annually drained from the Imhoff tank to sand drying beds. The dried sludge is dumped on a land fill site.

The adjoining old *Atiamuri Village* was built for hydroelectric construction staff and is not connected to the wastewater network.

In the long-term it is possible that Taupō District Council will develop a reticulation scheme to incorporate these lots into the existing Atiamuri WWTP.

The key issues relating to the management of the sewerage scheme are:

- No growth.
- Increasingly higher environmental standards and resulting high monitoring costs.
- Continued maintenance and monitoring to ensure the treatment and service standards are maintained.
- Resource consent expires on the 01/02/2023.

ASSET DESCRIPTION

The wastewater from the Hydro village is treated in a 60 m^3/day Imhoff tank designed for 200 persons at 300 l/h/day. The treated effluent is discharged onto 140 m^2 of land using dosed aerobic trenches with an infiltration rate of 300 mm/day. The reticulation consists of glazed earthenware and PVC pipes. The system is not connected to the telemetry system.

Resource Consent number 109488 was granted to discharge up to 64 m^3/day into ground This Right expires on 1 February 2023. The capacity of the plant is 64 m^3/day and the capacity of the reticulation is 30 m^3/day.

A new resource consent will allow for connection of the entire Atiamuri community to the wastewater treatment plant.

A summary of asset replacement valuation (2019/20) is given below:

Scheme	Atiamuri
Reticulation	$ 336,942
Treatment and Disposal	$ 332,647
TOTAL	$ 659,589

ASSET CONDITION

The system was installed in the early 1960's and has had some upgrading in 1991. Generally, the system is in good condition.

ASSET CAPACITY/PERFORMANCE

Capacity

The scheme serves approximately. There is very little catchment growth other than the possible connection of the non-services part of the community. The volume of wastewater is not directly measured however the volume of wastewater is expected to be well under consented flows. The wastewater volumes are calculated based on the number of dwellings and the amount of water consumption.

Reliability

The system is considered very reliable. During the past five years there were no blockages or root intrusion problems recorded for this scheme. Generally, the reticulation system is considered reliable.

Effluent quality

The Imhoff tank provides only a basic level of primary treatment. consent conditions are met. Quality test on average are taken four times per year to determine the influent characteristics and effluent quality.

Operation and Maintenance Plan

Standard operation and maintenance information is provided in Section 8 of this Asset Management Plan.

DEVELOPMENT PLAN

Half of Atiamuri Village (the "Old Village") is currently still using septic tanks. There is an option to extend the existing reticulation to incorporate the "Old Village" and send the wastewater to the existing Atiamuri Sewage Treatment plant (Imhoff tank with effluent disposal to ground through soakage). The driver for this project will likely be Regional Council requirements for the property owners in old Atiamuri to improve treatment standards. This project is not considered in the 30-year plan.

The resource consent expires in 2023, planning for the renewal of this consent will occur two years prior to the expiration date.

Flow measurement device is scheduled for installation in 2020 to enable data collection prior to the connect application. Upgrade to the wastewater treatment plant is scheduled for completion by 2023.

Project Name	Project Description	2021-22	2022-23
Atiamuri WWTP Upgrade	The wastewater discharge consent expires in 2023 and it is likely that a WWTP upgrade for nutrient removal is required. The existing plant is not powered and provides no treatment other than simple solids settling.	$ 50,000	$ 350,000


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Kinloch

In late 1984 Council entered into an agreement with the Kinloch developer to provide a wastewater reticulation and a treatment plant. The wastewater collection and treatment system were completed in 1988.

The community has experienced significant growth; and this has driven the need for minor upgrades at the WTTP over recent years.

The treatment capacity of the WWTP is now pushed to it limits and a major upgrade to the WWTP is in progress. The project look will convert the treatment plant to a Membrane Bioreactor and this will add significant capacity and improve treatment performance.

A subsurface dripline disposal system has been installed in the 10-hole public golf-course and in the land surrounding the WWTP; this was commissioned in November 2020.

The legal description of the disposal field is given by: - pt 2 DPS 12496 blk xvi marotiri sd. Map reference NZMS 260 u18:646 791.

The key issues relating to the management of the sewerage scheme are:

- The need for infrastructure expansion to accommodate growth
- Increasing environmental standards e.g. improved buffering capacity within the plant and expanded and improved land disposal system in the Kinloch public golf course.

ASSET DESCRIPTION

The wastewater reticulation consists of pipe work ranging from 100mm to 200mm and seven pump stations at Kinloch. The wastewater is pumped to the treatment plant which is a sequential batch reactor (SBR) plant. The plant which carries out the functions of equalisation, aeration and sedimentation in a time sequence, each tank having five operating modes: fill, react, settle, decant and idle. The existing Kinloch WWTP includes inlet screen and grit removal, two SBR treatment tanks, a waste activated sludge (WAS) tank, treated effluent storage, and disposal pump station to feed the current irrigation area.

The telemetry system is used to monitor the remote pump stations and treatment plant.

A summary of asset replacement valuation (2019/20) is given below:

Scheme	Kinloch
Reticulation	$ 10,486,426
Treatment and Disposal	$ 5,326,757
TOTAL	$ 15,813,183

ASSET CONDITION

The treatment plant was commissioned in March 1988, was upgraded in 1999 and 2003 with a control system upgrade in 1999, and an upgrade to the inlet works in 2003, and is still in good condition. The condition assessment of the treatment facilities in regularly undertaken.

ASSET CAPACITY/PERFORMANCE

Capacity

Upgrade to the Kinloch WWTP will be required to improve the level of treatment as the town grows.

A new resource consent (113402.01.01) for wastewater discharge has recently been granted on March 2014 for up to 1500 m^3/day, which was applied for renewal in October 2005. The permitted methods of effluent discharges to land include dripper irrigation lines within the public 9-hole golf course and traditional trenches.

Reliability

The wastewater network in generally very reliable. We have responded to a few recent blockages with an increased cleaning programme.

Operation and Maintenance Plan

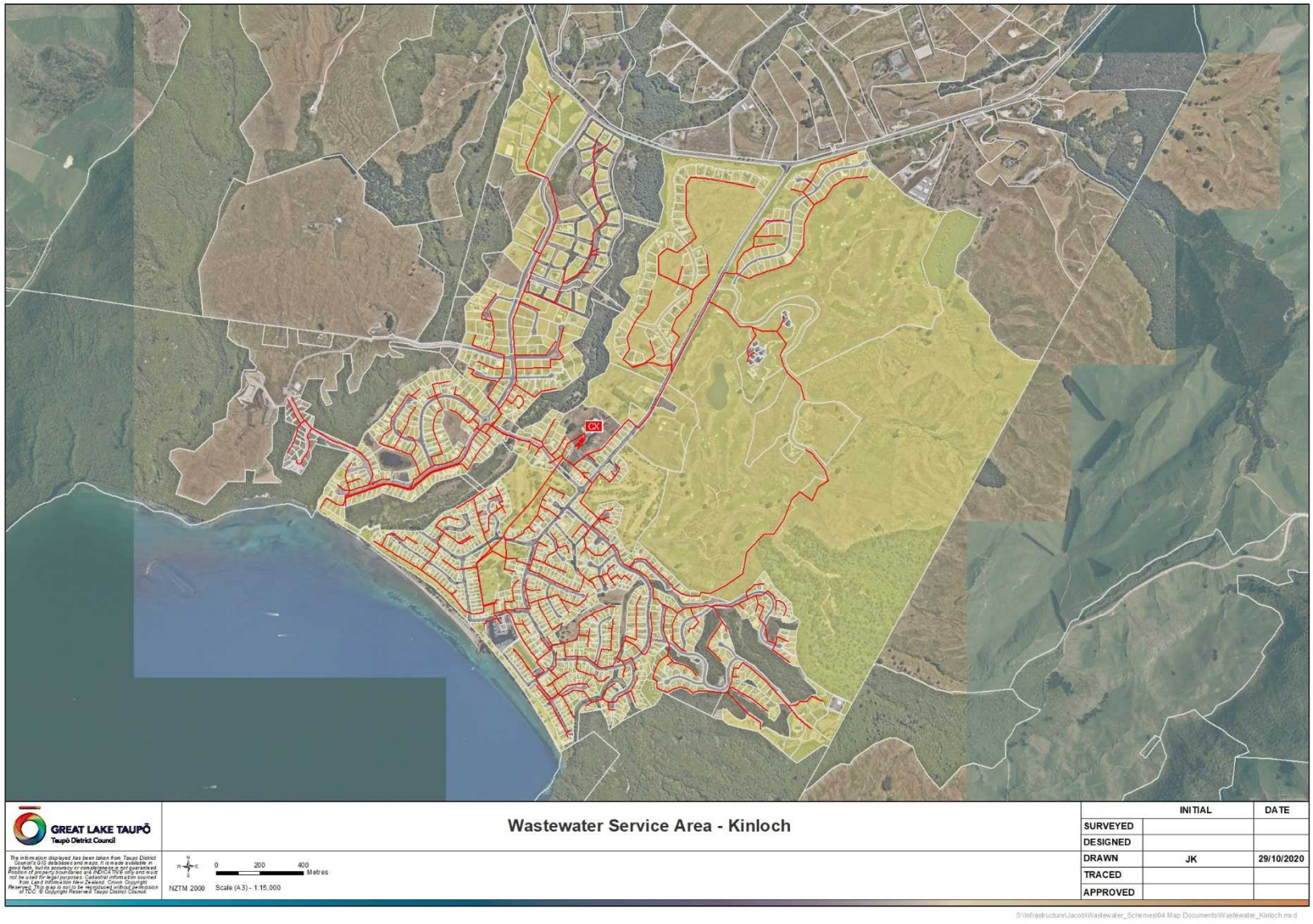
Standard operation and maintenance information is provided in Section 8 of this Asset Management Plan.

DEVELOPMENT PLAN

Several upgrades to the wastewater plant, disposal system and improvements to storm water management at the plant are scheduled over the next 5 years.

Completion of the Kinloch WWTP upgrade is scheduled for 2021.

Project Name	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Kinloch wastewater TP MBR (formerly balance tank)	9,000,000	0	0	0	0	0	0	0	0	0
'Kinloch wastewater MBR upgrade - Second reactor	0	0	0	0	0	0	0	50,000	1,000,000	0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Taupō District Council
Wastewater Service Area - Kinloch
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Mangakino

ASSET INFORMATION

Mangakino township was established in the late 1940's as a Ministry of Works village to house construction workers (and their families), employed on hydro-electricity schemes on the Waikato river. It was intended that the village should be dismantled at the completion of the construction and therefore much of the infrastructure in the town was of a temporary nature, designed to last 20 - 25 years.

The original system used septic tanks in the collection system and an Imhoff tank to provide primary treatment, followed by a sand filtration system installed during the mid-1990's in an attempt to further clean the effluent prior to discharge. Treated effluent is discharged to an underground dripper soakage system that has previously failed due to the high solids and BOD load.

In 2006 the Mangakino Wastewater Treatment Plant (WWTP) was upgraded to include a new secondary treatment stage, in the form of a new Submerged Aerated Filter (SAF) plant. The new plant includes a pumping station that conveys the primary treated wastewater into the SAF reactor tanks. The plant was fitted with a standby emergency diesel generator, to ensure uninterrupted operation of the plant in the event of a power failure. There have been instances where the installed storage volume at the plant has proven to be insufficient to prevent overflow events. An emergency generator has been installed to reduce the risk of overflow. Overflows are contained within an open bunded area formed as a depression in the surrounding land. This bunded area is open to the public and hence represents a public health risk during and for some time subsequent to an overflow event.

Excessive storm water infiltration occurred during rain events due to the reticulation network being in poor condition as well as some connection of private storm water drains to the sewer network. This contributed to the occurrence of overflow. Over the period of 2016 – 2020 significant improvements have been made to the reticulation system and the peak flows in heavy rain events have reduced significantly. The network is now is very good condition.

Rapid infiltration trenches where installed at the North side of the golf course to improve the performance of the disposal system and these have worked well and enabled the drip irrigation system to recover. There is now adequate disposal capacity to manage the peak flows as well as any growth in the community. Plans have also been developed for extension to the

The key issues relating to the management of the sewerage scheme are:

- Increasing activity in Mangakino generating more wastewater
- Improvement to the network have resulted in less leakage losses.
- Upgrade to the WWTP is required to manage the increase volumes being received and to reduce nitrogen discharges.

- Main sewer lines have been constructed across the middle of building sites and dealing with buildings over sewers is a frequent problem.
- The old network septic tanks remain in service and will require removal following upgrade of the WWTP.

ASSET DESCRIPTION

The existing township reticulation is separated into four main catchment areas. Three of the areas each drain to a communal septic tank and the fourth area drains directly to the plant. The 150 mm diameter sewer collects effluent from all of the treatment tanks and the wastewater process through a SAF prior to discharging to ground.

Properties in the industrial area have individual septic tanks which discharge to soakage. The industrial area cannot be served by an extension to the existing reticulation unless a pump system is installed, and additional treatment capacity is added.

The Resource Consent for discharge has lapsed and a new consent has been sought and is expected to be in place in late 2020 or early 2021.

The asset replacement valuation (2019/20) is give below:

Scheme	**Mangakino**
Reticulation	$ 3,178,590
Treatment and Disposal	$ 4,920,340
TOTAL	$ 8,098,930

ASSET CONDITION

The reticulation is in very good condition following a significant renewal programme. Most of the reticulation pipes are covered by buildings, which makes renewal of reticulation slightly more complex. The storm water drains are also connected to sewer main in some dwellings and many of these connections have been removed as part of the renewal work.

The treatment plant is new and in good condition. The only asset class that maybe poor condition are the original network septic tanks and there is a plan to remove this following upgrade of the WWTP.

ASSET CAPACITY/ PERFORMANCE

Capacity

There are no capacity constraints in the network however treatment capacity, and capacity for nitrogen removal will need to increase.

Reliability

Relining of the sewer has improved reliability of the network and treatment operations. There are no know reliability issues.

Operation and Maintenance Plan

Standard operation and maintenance information is provided in Section 8 of this Asset Management Plan.

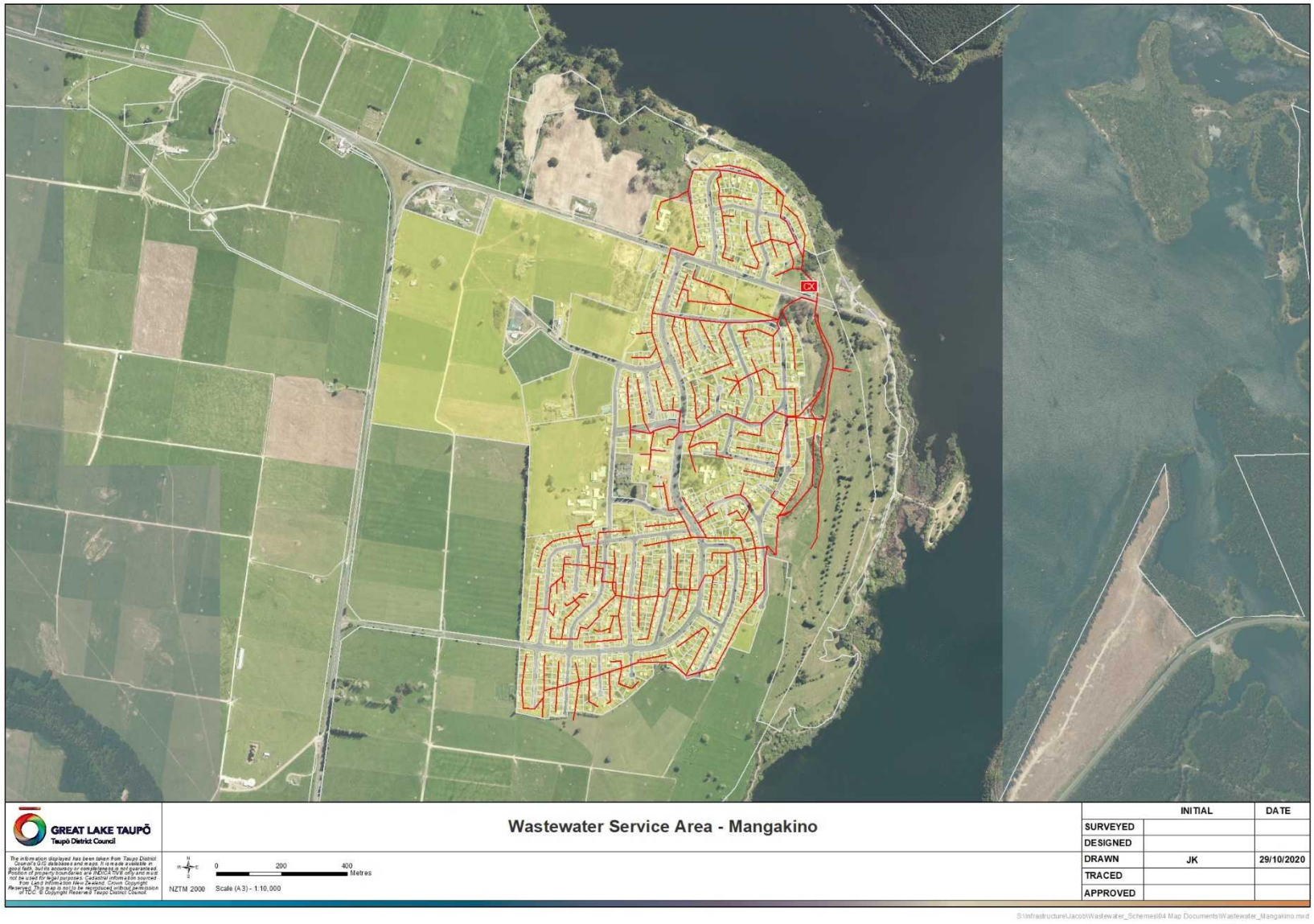
RENEWAL PLAN

Removal of the network septic tank.

DEVELOPMENT PLAN

Upgrade of the WWTP is to be scheduled once the new resource consent is gained.

Project Name	Project Description	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31
'Mangakino wastewater WWTP Upgrade	'Centralized primary treatment and nitrogen removal	0	0	0	100,000	1,800,000	0	0	0	0	0


GREAT LAKE TAUPŌ
Taupō District Council
Wastewater Service Area - Mangakino
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Motuoapa

ASSET INFORMATION

The Motuoapa Village Urban Drainage Area was constituted in 1983 and comprises two parts; the old lakeside settlement, with the shop, garage, motel etc. and the new residential on the opposite site of the state highway.

Lots in the old settlement have on-site septic tanks and the effluent from these tanks' anaerobic effluent from the septic tanks is pumped to the wastewater treatment plant. Council maintains these septic tanks. The new lots in upper Motuoapa are connected to a conventional gravity sewer.

The treatment plant was commissioned in 1987 and designed for a peak flow of 270 m^3/d and a peak population of 1,080. In 2006 an additional SBR reactor was fitted to the existing second tank (the tank was previously used as a treated effluent holding tank), increasing the capacity to allow for development and additional aeration was added. In 2016 an influent balance tank and odour control system where installed.

ASSET DESCRIPTION

The sequence batch reactor (SBR) treatment plant treatment plant carries out the functions of equalisation, aeration and sedimentation in a time sequence, each tank having five operating modes: fill, react, settle, decant and idle. Treated effluent is pumped to the adjacent disposal filed for disposal.

A resource consent to discharge up to 500 m^3/day of treated wastewater to land was obtained in 2013 and expires on November 2033.

A summary of asset replacement valuation (2019/20) is given below:

Scheme	Motuoapa
Reticulation	$ 3,268,530
Treatment and Disposal	$ 4,711,726
TOTAL	$ 7,980,256

ASSET CONDITION

The only known issue in condition is related to the network in the old part of Motuoapa. Under conditions of high lake level, the reticulation experiences a degree on infiltration. Condition inspection is required however it can be difficult to locate points on infiltration when it not occurring (low lake levels).

ASSET CAPACITY/PERFORMANCE

The old village reticulation dates from 1950's has adequate capacity and is not expected to require major upgrading.

The new consent conditions coupled with the growth of the community triggered the need for a wastewater treatment plant upgrade. The upgrade has recently been commissioned and will improve nitrogen removal from the wastewater.

Effluent Quality

Effluent quality is generally very good however there has been occasion in recent year where performance has slipped. There have been issued related to high inflow (lake level), suspected illegal dumping of waste into the sewer network and these have affected the plants performance. Peak holiday periods always present a challenge for operations team to 'tune' the treatment plants for optimal performance.

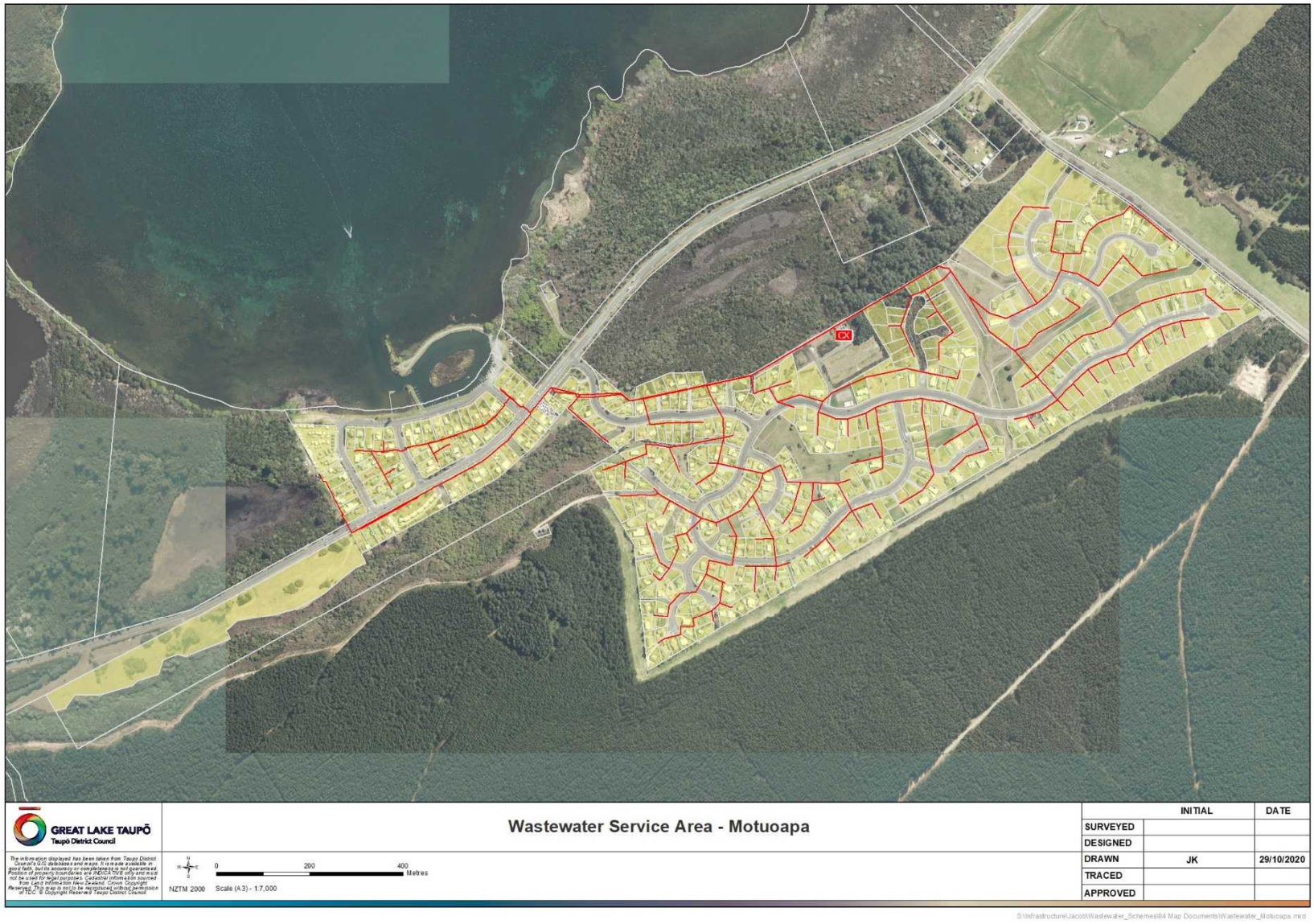
Operation and Maintenance Plan

Standard operation and maintenance information is provided in Section 8 of this Asset Management Plan.

DEVELOPMENT PLAN:

There are no capital projects proposed for Motuoapa wastewater network.

Project Name	Project Description	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31
Motuoapa wastewater instrument and control systems upgrade	'Instumentation and control changes to improve reliable N removal performance. This project would concider the use of alternaitve analysers for SBR control.	0	0	0	0	0	0	0	100,000	0	0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Motutere

ASSET INFORMATION

Motutere is a holiday resort is a campground located on the eastern shores of Lake Taupō. Apart from the two people at the motor camp there are no permanent residents and it is anticipated that the situation will remain as predominantly a holiday resort. There is an 18 residential community at the point that are not connected to the wastewater scheme.

Initially the wastewater disposal was by disposal to septic tanks and the soakage to ground but the impacts were being observed in Lake Taupo. In 1985 the system was upgraded to a steptic tank effluent pumping system and the effluent was discharged after aeration and settlement to native bush by spray irrigation.

The treatment process was upgrade again in 2016 to further improve treatment through installation of a SAF WWTP and denitrification bed.

The key issues relating to the management of the sewerage scheme are:

- High fluctuation in population.
- Regular lake shore monitoring.
- Uncertain growth at the campground.
- Potential additional of the 18 residential lots.

ASSET DESCRIPTION

The wastewater scheme consists of seven septic tanks at the motor camp which are used for primary treatment. The septic tank effluent and flows from local dwellings then flow by a gravity pipeline to two step effluent pump stations. These then pump the effluent to the main pump station, where it is conveyed to the treatment plant. The treatment plant consists of a two-tank submerged aerated filter (SAF) plant followed by a carbon bed prior to discharge to the forest irrigation site. The system is connected to the telemetry alarm and control system.

Resource Consent number 135813.01.01 was granted to discharge up to 135 m^3/day onto ground. This Right expires on 30 June 2040.

The asset replacement valuation (2019/20) is:

Scheme	Motutere
Reticulation	$ 115,866
Treatment and Disposal	$ 1,300,416
TOTAL	$ 1,416,282

ASSET CONDITION

The scheme was built in 1991. The treatment Plant was upgraded to improve nitrogen removal in 2006 and is in good condition.

ASSET CAPACITY/PERFORMANCE

Capacity

This area is predominately a motor camp so there is very low loading for most of the year. Christmas to mid-February provides the highest loading.

The treatment plant does not remove nitrogen over the peak period but does outside of this busy period. Overall, the treatment plant is near capacity and continued growth in the campground or connection of the Point community will require a treatment plant upgrade.

Reliability

The Motutere system is reliable with minimal problems experienced.

Effluent Quality

Tests are carried out on the system to determine the influent characteristics and effluent quality.

Treatment performance is typically good during the off season but deteriorates over the summer holiday period.

Operation and Maintenance Plan

Standard operation and maintenance information is provided in Section 8 of this Asset Management Plan.

DEVELOPMENT PLAN

Overall, the treatment plant is near capacity and continued growth in the campground or connection of the Point community will require a treatment plant upgrade. The need to upgrade this plant is contingency on these triggers.

Project Name	Project Description	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Motutere wastewater TP capacity upgrade	WWTP Upgrade	0	0	100,000	500,000	0	0	0	0	0	0
Moturere Point reticulation	Reticulation of Motutere Point	0	0	0	400,000	0	0	0	0	0	0


GREAT LAKE TAUPŌ
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Omori

ASSET INFORMATION

The Omori wastewater scheme was constructed in the early 1970's to serve the settlement of Omori and in 1983 Kuratau was added. While the reticulation was expanded to service large areas of new development the original oxidation pond and effluent disposal areas had remained unchanged until 1996/97 when new treatment and disposal works were constructed. The new works were essential as overloading was occurring especially when the effluent from Pukawa was transferred to the plant. An embargo had been placed on development until the new treatment plant was built prior to the system upgrade. The pump stations were adequate, but storage and control facilities were not and as a result overflows to the beach front occurred with increasing frequency.

The combined settlements of Pukawa, Omori and Kuratau comprises close to 1,200 residential lots with potential to grow to approximately 1,600 lots.

The key issues relating to the management of the sewerage scheme are:

- Fluctuating summer loads results in the system being heavily loaded for a short period of the year.
- Management of increase wastewater loads as the community grows.
- The old oxidation pond at Pukakwa required full decommissioning and remediation.

ASSET DESCRIPTION

Wastewater is collected by gravity mains and then pumped to oxidation ponds where the final effluent is disposed of by spray irrigation to land. The Omori disposal field consist of 300 sprinklers.

The Pukawa wastewater is discharged to an oxidation pond of approximately 0.5 ha, located close to residential lots and this can result in odour complaints. From here effluent is pumped to Omori through an overland line in a bush reserve.

Resource Consent number 135810.01.01 was granted to discharge up to 800 m^3/day onto land. This Right expires on 31 April 2044.

A summary of asset valuation (2019/20) is given below:

Scheme	Omori
Reticulation	$ 7,073,506
Treatment and Disposal	$ 4,227,429
TOTAL	$ 11,300,935

ASSET CONDITION

The lake edge pump stations were upgraded in 2000 to provide telemetry monitoring, connectors for emergency standby power and overflow storage. All were interlinked to control overflow.

ASSET CAPACITY/PERFORMANCE

Capacity

Some areas of the reticulation are fully loaded as a result of expansion of the drainage area and separate collection and pumping systems will be required for any new development.

Under normal conditions the system can cope with summer holiday loading although this part of the plant is close to its capacity. Intense storms may result in overland flow at the land disposal site. The flow meters are installed to monitor the flow from each catchment areas.

Reliability

There are some frequent pump station blockages occurring due to ragging of pumps. The media release is being done and it has some improvement. Possibly annual media release and or new control system improvement to SCADA / communication system will reduce these costs.

Effluent Quality

Currently meets consent conditions in terms of annual nitrogen mass loading however we need to improve flow measurement and communications at the site. New filtration equipment was installed in 2020.

Operation and Maintenance Plan

Standard operation and maintenance information is provided in Section 8 of this Asset Management Plan.

DEVELOPMENT PLAN

There are no capital projects scheduled for the Omori wastewater scheme within the 10 years plan.


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Taupō District Council
Wastewater Service Area - Omori
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Taupō

ASSET INFORMATION

The Taupō Wastewater Treatment Plant (Taupō WWTP) was commissioned in 1975 to treat the wastewater from Taupō Township. It was designed to cater for a population of 12,500 and remove 80 % of suspended solids and 80 % of the Biological Oxygen Demand (BOD). The treatment plant is not designed for nitrogen removal as this achieve through crop growth at the irrigation sites.

The Taupō WWTP services most of the Taupō urban area. The treatment plant consists of primary clarifiers, tricking filters, and a secondary (humus) clarifier as well as sludge conveyance, thickening, digestion, dewatering and disposal. The treated wastewater leaving the secondary clarifiers is pumped to the irrigation balancing ponds at the Rakaunui Road LDS through a 375 NB rising main, which is 4.6km long. The water is then irrigated on this site or pumped onto the View Road LDS site which was constructed in 2008.

In 1985 the Treatment Plant was extended to double the capacity to serve a population of 27,000 people. The addition of a grit removal process was added between the bar screen and the primary sedimentation tanks. At that stage, 90% of the suspended solids and BOD was removed before discharge to the Waikato River.

Both Waikato Regional Council and the Taupō District Council wished to end the discharge of treated effluent to Waikato River. A three-stage pumping system and storage ponds was built to transfer the effluent for land disposal at a site 5 km north of Taupō. The Taupō Sewage Land Disposal Scheme was opened in September 1995 and built at a cost of $5.3 million. In December 2008 an additional LDS site started operating at View Road. This scheme uses pivot irrigators as opposed to "pop ups" like at Rakaunui Road. In 2008 the Rakaunui Road site needed to be replumbed due to the construction of the ETA (East Taupō Arterial) Road.

The key aim of these schemes is to eliminate direct discharge of effluent to the Lake and River to enhance the environment as it was considered an affront to the Tangata Whenua. In addition, the quality of the water in the lake was of national importance as Taupō is an important tourist centre.

The grass from each of these sites are harvested 4-5 times per year, this haylage is sold to supplement the cost of running these systems.

The legal descriptions of the assets are shown in Table below.

Address	Legal Description	Use	Valuation No.
Off State Highway 1	PT TGA TPO 1 B2, SO 53681	Wastewater pump station	742029700
Rakaunui Road	Pt Sec I, SO 58810,BLK II Tauhara DS. Map NZMS 260 U18 804 787	Discharge effluent	738801818
View Road	Sec 1 SO 383887 Sec 2 SO 383887	Discharge effluent	738803828

146 Rickit Street	PT SEC 17 and 18, SO 48924. Map Ref NZMS 260 U18:780 763	Wastewater treatment plant	730372600

The key issues relating to the management of the sewerage scheme are:

- Changes to resource consent conditions that effect the irrigation processes i.e. requirement for greater land area and also the possible need for future UV disinfection.
- Capacity upgrades of the WWTP as growth occurs.
- Odour discharge from the treatment plant due to the proximity of housing (constructed after the WWTP).

ASSET DESCRIPTION

The Taupō wastewater system consists of a gravity reticulation system, pump stations, a conventional wastewater treatment plant and disposal of treated effluent to an irrigation field. The telemetry system is used to monitor the various pump stations and treatment facilities.

The treatment plant consists of a bar/ step screen, grit removal, two primary and one secondary sedimentation tanks, three high rate trickling filters, sludge reception and storage for waste sludge from the other community plants, sludge drawn thickener, sludge conditioning and primary system, three sludge digesters, two balancing ponds, a wet weather inflow diversion pond,. The sludge is de-watered on a belt press before it is processed to vermicompost (wormfarm) by an external contractor.

Following treatment, the average daily flow of close to 7,000 m^3/d of treated effluent is pumped to one of two sites.

The first being the Rakaunui Road irrigation site. The irrigation pump pumps the effluent into the 200 mm diameter irrigation ring main system. The irrigation site is divided into 10 blocks, 30 spray areas and pipe work for 3,300 pop-up irrigation sprinklers. A 20-metre-wide buffer zone protects the public from spray drift; however, this is under review as the site is being reconsented. The second site is at View Road and it consists of 8 pivot irrigators. This site appears slightly better at capture of nitrogen compared to the Rakaunui Road site. As of 2020, each site has approximately 120 of active irrigation area.

The original treatment plant is still in use but has been upgraded over the years and is still undergoing upgrades as required. Recently an additional digester and trickling filter have been added.

Resource Consent has been granted to discharge up to 9,000 m^3/day of municipal wastewater onto land at Rakaunui Road. This consent expired on 31 December 2015 and a replacement consent has been applied for. As for October 2020 the consent application has now been consulted on and a new consent is expected to be granted in the coming months.

Resource Consent number 116596 have been granted to discharge up to 15,000 m^3/day of municipal wastewater onto land at View Road. This right expires in 2032.

A summary of the asset's replacement valuations (2019/20) are shown below:

Scheme	Taupō
Reticulation	$ 68,258,364
Treatment and Disposal	$ 63,705,977
TOTAL	$ 131,964,341

ASSET CONDITION

The Taupō wastewater scheme was developed at various times and is generally good condition. Occasionally blockages are caused by tree roots, fat build up and wet wipes. Pipelines in the commercial area (CBD) are water blasted once every year.

ASSET CAPACITY/PERFORMANCE

Capacity

The Taupō wastewater treatment plant has recently been expanded and a third anaerobic digester and a third trickling filter. A third primary settling tank will be required as the next upgrade to increase capacity.

The Transfer PS within the WWTP is also at capacity in significant storm events and upgrade of the PS will be required to reduce the risk of future wastewater overflows to the rivers during extreme events.

The reticulation system trunk mains have minimal spare capacity. Progressive upgrading of the inverted siphon river crossing and the new trunk mains will allow expansion north and west of the river. Continued expansion to the South is also reliant on upgrading of the main trunk sewer.

Reliability

There has been the occasional overflow of the reticulation system that has occurred including several instances of overflow to the lake shore and to private property. Most commonly these are due to roots intrusion and people putting unsuitable items down toilets or drains, including oil, grease, fat, bandages, sanitary pads, nappies, fabric wipes, or any other similar objects. Maintenance is increased in areas where repeated issues occur.

Effluent Quality

Effluent quality is generally in line with the design of the plant however E.coli limits have been exceeded previously.

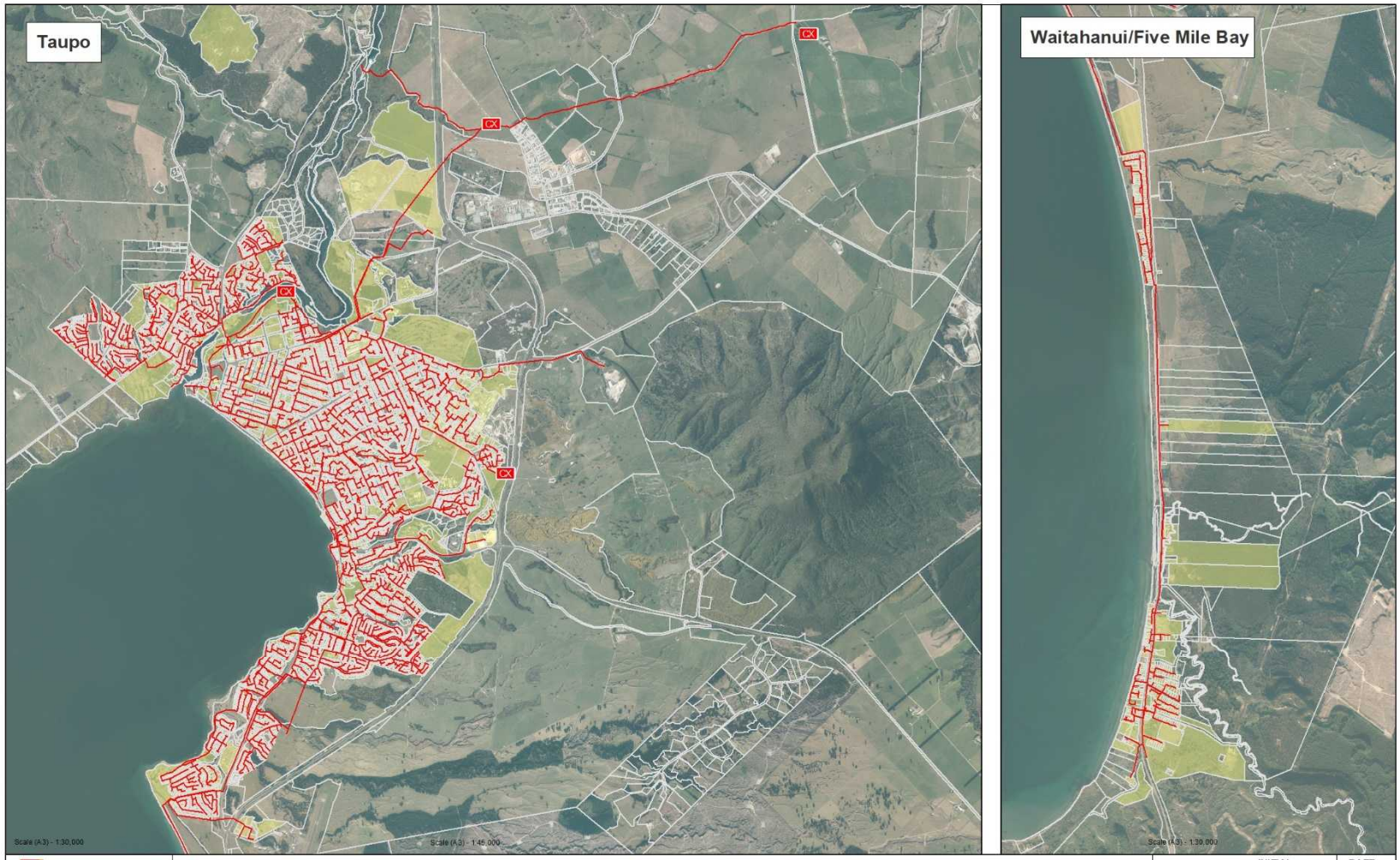
Operation and Maintenance Plan

Standard operation and maintenance information is provided in Section 8 of this Asset Management Plan.

DEVELOPMENT PLAN

Capex projects are summarized below:

Project Name	Project Description	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Taupo wastewater - Eastern trunk main capacity upgrade (programme)	Upgrade to the Eastern trunck main to accomodate growth.	0	0	0	150,000	1,110,000	540,000	0	0	0	0
Taupo wastewater - Improved WWTP Resiliance (overflow risk reduction)		100,000	0	0	750,000	0	0	0	0	0	0
Taupo wastewater - Irrigation expantion (new land area)	'This project will provide additional irrigation area for dispoal of Taupo wastewater. The project includes; land purchase, enabling works, development of a new land disposal system, buffer zone planting, resource consenting.	0	0	0	0	0	0	7,000,000	0	0	7,000,000
Taupo wastewater - WWTP Primary Clarifier 3	Add additioanl Primary Clarifier to the Taupo WWTP to accommodate growth.	0	0	200,000	1,900,000	0	0	0	0	0	0
Taupo wastewater AC rising mains renewals	2000m of AC rising mains (1978-88) to be renewed	0	0	0	0	0	0	0	0	0	0
Taupo wastewater Control gate bridge siphon	Expand capacity to accommodate growth on the Northern side of the bridge	750,000	1,000,000	0	0	0	0	0	0	0	0
Taupo wastewater irrigation UV disinfection, effluent filtration and transfer pump station capcity increase	UV disinfection project address health risk related to spray drift at irrigation sites in Taupo. The programme of work also includes Improvements to plant to reduce risk of emergency overflow events. The crictal risk to be addressed is the Transfer Pump Station Upgrade.	200,000	2,400,000	2,600,000	0	0	0	0	0	0	0
Taupo wastewater sewer Renewals	Allow for renewal works to address I&I issues in the	0	0	0	0	0	0	0	0	0	0
Taupo wastewater Southern trunk main upgrade	This project provides additional capacity to support growth in the Souhtern Area	800,000	4,500,000	4,500,000	0	0	0	0	0	0	0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Turangi

ASSET INFORMATION

The early development at Turangi began between the State Highway and the Tongariro River. The wastewater system was built by The Crown in 1965 to serve the old part of town and the newer part that was built for the Tongariro Power Development. This includes the industrial area south of State Highway 41. During the construction of the power project between 1968 and 1974 the town population was approximately 20 % greater than in the 1990's.

The power development scheme was expected to raise the population to 6,000 persons. The treatment plant was a model scheme with primary and secondary ponds and surface irrigation over grassed slopes. An impermeable layer under the grass meant that the effluent flowed towards side drains and drained through artificial wetland (mostly channelled) to an artificial drain and through a natural wetland to the Tongariro estuary and Lake Taupō.

In 1996/97 sludge and solids were cleaned out of the oxidation ponds. A step screen was added to the inlet and pumps and micro-strainers were added to the land irrigation system.

During the 1990's, the population has been approximately 4,500. Turangi (including Tokaanu) has 2,210 connections and 110 vacant lots that are not connected to the system.

Wastewater effluent from the existing Turangi Wastewater Treatment Plant (Pond system) is unable to meet the effluent quality requirements of the new resource consent. A significant upgrade of the existing treatment plant process was required to consistently comply with the new and higher discharge standards set by Waikato Regional Council, in particular nutrient (nitrogen and phosphorus removal) and disinfection to comply with faecal coliform levels.

A membrane bioreactor (MBR) plant was commissioned in January 2006 and compliance to date has been reasonably good to achieve total nitrogen discharges below target but has experienced poor performance during high inflows when storage on influent in the ponds has been required.

The wastewater from Tokaanu is also pumped back for treatment at the Turangi WWTP.

The Tokaanu Township is an historical settlement based around traditional Maori and European tourist interest. Much of the area is low lying and swampy following the raising of Lake Taupō. It has a history of wastewater related problems which range from pollution of the lake shore to soakage difficulties due the high-water table. Tokaanu is a Septic Tank Effluent collection system with treatment at the Turangi Wastewater Treatment Plant.

The first stage of the collection and pumping system was implemented in 1989 and the second stage in 1992.

The Tokaanu settlement is spread over 27 hectares in a band 180 metres wide by 1.5 km long. Within Tokaanu there are 50 domestic or commercial buildings with a dwelling equivalent of 52. The Tokaanu settlement is responsible for the maintenance of the Tokaanu collection system and contributes a share of the cost of the operation and maintenance of the Turangi treatment system.

The key issues relating to the management of the Tokaanu section of the sewerage scheme are:

- Many wastewater pipelines have flat grades.
- Blockages in the network due to residents putting unsuitable items down toilets or drains, including oil, grease, fat, bandages, sanitary pads, nappies, fabric wipes, or any other similar objects.
- Inflow/infiltration due to deteriorating pipes.
- Geothermal ground causing damage to infrastructure, particularly the small step pump stations and connecting pipelines.
- High water table and aggressive water.

The key issues relating to the management of the sewerage scheme are:

- Obtaining replacement resource consent for wastewater discharge.
- Land ownership grievances, relationship with key stakeholders.
- Potential for a land-based disposal system.
- Infiltration into reticulation due to deteriorating pipes and manholes
- Maintain consistent treatment plant performance.

ASSET DESCRIPTION

The current Turangi wastewater system is a conventional raw wastewater collection and pumping system. Pre-treatment comprises a new perforated plate screen and grit removal system. The existing step screen has remained to provide standby capacity. The screens are bagged for transport to the Taupō landfill and peak and diurnal flows are balanced in part of the existing oxidation pond.

Up until February 2006 the effluent has been discharged through two pumps and Arkal Spin Klin automatic backwash filters. The effluent is distributed to 7.5 hectares of irrigation beds. Effluent flowing off the irrigation beds is collected in drains and flows across artificial wetlands that flow through the natural wetlands to Lake Taupō.

The system now consists of a new MBR plant complete with alkalinity dosing (sodium carbonate) and Alum dosing for phosphorus removal. The plant contains anoxic, aerobic, and a membrane zone with sludge recycling to return active biomass to the inlet of the biological process.

A new blower house has been constructed as part of the tank to house the blowers and a new control building with associated electrical/control system. Final effluent (termed ‘permeate’) from the MBR process is now pumped for discharge approximately 1.0 km directory to the Hangarito stream.

In addition to the new MBR, the plant incorporates the use of the existing Pond 1 as part of an influent flow balancing system and for effluent flow containment during times of flooding. This has been achieved through the conversion of Pond 1 into two smaller ponds, with new waste bands constructed.

Rehabilitation of the disused pond sites are required.

Resource Consent number 102927 was granted to discharge up to 2,100 m³/day into the Hangarito Stream and Taupō South wetland and this consent expired in June 2018. A replacement consent application was lodged in December 2017 and the application is on hold pending consultation outcome with iwi. A land-based disposal system is being proposed.

The asset replacement valuation (2019/20) is:

Scheme	**Turangi**
Reticulation	$ 12,223,642
Treatment and Disposal	$ 11,344,955
TOTAL	$ 23,568,637

ASSET CONDITION

Reticulation was built in 1964-68 and is suffering some inflow and infiltration.
Over the period of 2018 to 2020 a significant sewer cleaning programme has been in place and condition assessment and targeted repairs are following.

The assets associated with the new MBR plant are all in good condition.

ASSET CAPACITY/PERFORMANCE

Capacity
High infiltration into the network can cause high inflows to the plant in wet weather and at times this has exceeded the capacity of the WWTP. In these cases, wastewater storage is required

Reliability
Problems have occurred with fouling of the membrane surfaces. This has affected the performance of the plant and has increased the operational and renewal costs of membranes. An alternative source of membranes was found at much cheaper rates and performance is improving after some initial teething problems.

Effluent Quality
With the installation of a new treatment plant effluent quality has improved significantly.

The South Taupō Wetlands extends from Waihi Bay and the Tongariro River delta, to the Motuoapa peninsula. The wetlands are included in the International Ramsar Convention which is designed to protect natural wetland areas.

Comparison of groundwater sites show that there has been considerable difference in water quality, some of which is attributable to the Turangi wastewater treatment plant. A small trench in the corner of the irrigation field has revealed that cracks in the liner result in nutrients entering the ground water. The artificial wetlands are ineffective in treating nutrients in the oxidation pond effluent but passage through the natural wetlands does provide a limited degree of nutrient reduction.

Impact of the wastewater discharge was considered in an ecological assessment as aprt of the resource consent application.

Operation and Maintenance Plan

Standard operation and maintenance information is provided in Section 8 of this Asset Management Plan.

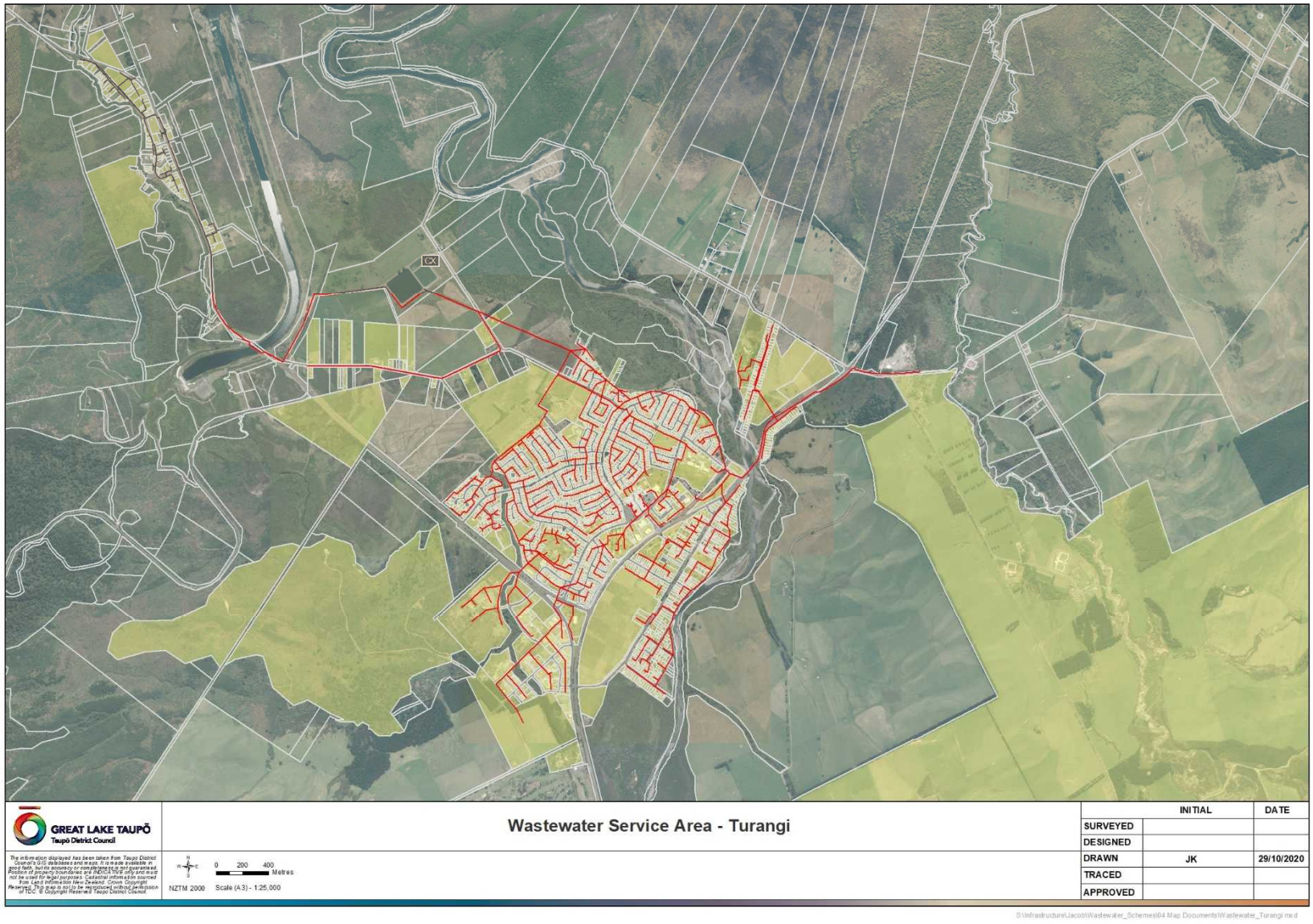
DEVELOPMENT PLAN

This plant does however have problems after heavy rainfall events when rainwater enters the system for treatment. This causes the influent to be low in carbon and the treatment process to work less effectively. The improvement plan was is to reduce the size of pond and build a lined pond to receive raw sewage.

There is some uncertainty around the long-term future for this site as a WWTP as there are significant land ownership grievances related to the site being taken from the original owners for use as a WWTP site. While this uncertainty remains such a significant project as the new balance pond is not being considered. Therefore, a carbon dosing system is to be installed to add with treatment performance.

Possible changes to the discharge location or area could be required and a budget has been pencilled in for this project however it will need to be refined as the scope is developed further. The timing of these two projects is aligned.

Project Name	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Turangi wastewater - Disposal system improvement	0	0	0	0	0	0	250,000	750,000	7,500,000	7,500,000
Taupo wastewater Control gate bridge siphon	750,000	1,000,000	0	0	0	0	0	0	0	0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Waitahanui

ASSET INFORMATION

Waitahanui and Five Mile Bay are two small settlements located in the outskirts of the Taupō urban area along the eastern lake shore. The treatment facility at Waitahanui has now been decommissioned and wastewater is pumped back to Taupo.

Waitahanui / Five Mile Bay is reticulated to a large extent by STEP systems (i.e. the Waitahanui WWTP receives septic tank effluent from individual household lots).

Most of the dwellings are holiday houses which are vacant for long periods. When the septic tanks are reactivated during the holiday periods odour problems can occur.

The asset replacement valuation (2019/20) is:

Scheme	**Turangi**
Reticulation	$ 4,462,783
Treatment and Disposal	$ 1,980,346
TOTAL	$ 6,443,129

Note: This scheme will be financial disposed of for the 2021 LTP. Treatment assets are to be disposed of and reticulation assest will be merged with the Taupo scheme.

Whakamaru

ASSET INFORMATION

The Whakamaru scheme consists of two distinct areas, the Hydro village and the old village. The Whakamaru Hydro Village was built for staff working on the Whakamaru Hydro Electric Scheme. The hydro village has 60 dwellings plus a hostel.

The 'old' Whakamaru village at the corner of Forest View Road and State Highway 41 is not served by a reticulated wastewater system and private septic tanks treat wastewater for the 30 dwellings in the community. There is currently no proposal to develop a wastewater system for the old village.

This scheme is similar in characteristics to Atiamuri. All lots within the hydro village are connected to the wastewater system which is capable of treating wastewater from 60 houses plus the hostel. It is operating at capacity and cannot cope with further expansion without major capital works.
The key issues relating to the management of the sewerage scheme are:

- Increasingly higher environmental standards and resulting high monitoring costs.
- Infiltration due to deteriorating pipes.
- Monitoring of the soakage effluent plume to ensure that no adverse environmental effects occur.

ASSET DESCRIPTION

The reticulation network at Whakamaru has been recently condition assessed and poor-quality pipes relined. The reticulation is therefore in reasonably good condition.

An advanced treatment process was installed in the WWTP in 2019 and this plant reduces nitrogen discharges and is compliant with resource consent conditions.

Resource Consent number 130354 was granted to discharge up to 75 m^3/day onto ground. This consent expired on 31 May 2036.

Asset replacement value for the (2019/2020) scheme are:

Scheme	Whakamaru
Reticulation	$ 481,522
Treatment and Disposal	$ 535,467
TOTAL	$ 1,016,989

ASSET CAPACITY/PERFORMANCE

Capacity
The plant is currently at capacity and would require capital input to accept more expansion. The Imhoff tanks and soakage field can serve 60 dwellings plus the hostel but any further

expansion would require an upgrade. An application is made to WRC for continued operation of the Whakamaru Wastewater Treatment Plant. It is noted from WRC River monitoring records that total annual load of nitrogen discharged from Whakamaru WWTP is minor (≅ 0.03%), hence no improvement is proposed in TYP.

Reliability

The network is in good condition and the treatment plant having been recently upgraded is also in good condition.

Effluent Quality

An advanced treatment process was installed in the WWTP in 2019 and this plant reduces nitrogen discharges and is compliant with resource consent conditions.

DEVELOPMENT PLAN

There are no future projects scheduled for Whakamaru.


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Taupō District Council
Wastewater Service Area - Whakamaru
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Whareroa

ASSET INFORMATION

The Whareroa wastewater scheme which was constructed in 1986 is south of the Whareroa stream. It is a gravity sewer scheme presently serving a small community of 202 residential lots when fullt developed.

The Whareroa north development comprising of 170 potential lots is proposed, which will require an upgrade to the wastewater treatment facility or an alternative means of nitrogen offset.

The key issues relating to the management of the sewerage scheme are:

- Potential development of the Whareroa North area.
- Increasingly higher environmental standards and resulting high monitoring costs.
- Improving the irrigation system and increasing land area requirement.
- Improved management of the cut and carry crop for additional nitrogen removal.

ASSET DESCRIPTION

The system consists of a gravity reticulation system draining to two pump stations which pump to oxidation ponds.

The primary oxidation pond has a surface area of 1,300 m^2 and the secondary pond an area of 2,600 m^2. The upper pump station consists of two pumps capable of pumping 10.3 l/s each and a 26 m^3 storage tank while the lower station consists of two pumps capable of pumping 6.2 l/s each and a 22 m^3 storage tank. The lower pump station pumps wastewater to the upper station from where it is pumped to the plant. The treated effluent is required to be spray irrigated to 1.3 ha of pastureland.

A new Resource Consent was granted to discharge up to 201 m^3/day onto the ground in 2019.

It was noted that during processing of the effluent discharge application the Resource Management Act allows WRC (consenting authority) to recognise the value of the investment.

The replacements asset valuation (2019/20) for the scheme is:

Scheme	Whareroa
Reticulation	$ 1,441,543
Treatment and Disposal	$ 1,270,697
TOTAL	$ 2,712,240

ASSET CONDITION

The treatment plant was commissioned in 1986 and the bulk of the infrastructure is still in good condition. The ponds have been lined due to major leaks. A new step screen was constructed in 2010 and a new aerator was installed in pond 1 in 2009.

ASSET CAPACITY/PERFORMANCE

Capacity
Reticulation capacity is good. The capacity of the irrigation system requires increasing as a result of new consent conditions and the subsequent changes is operating practices on the site.

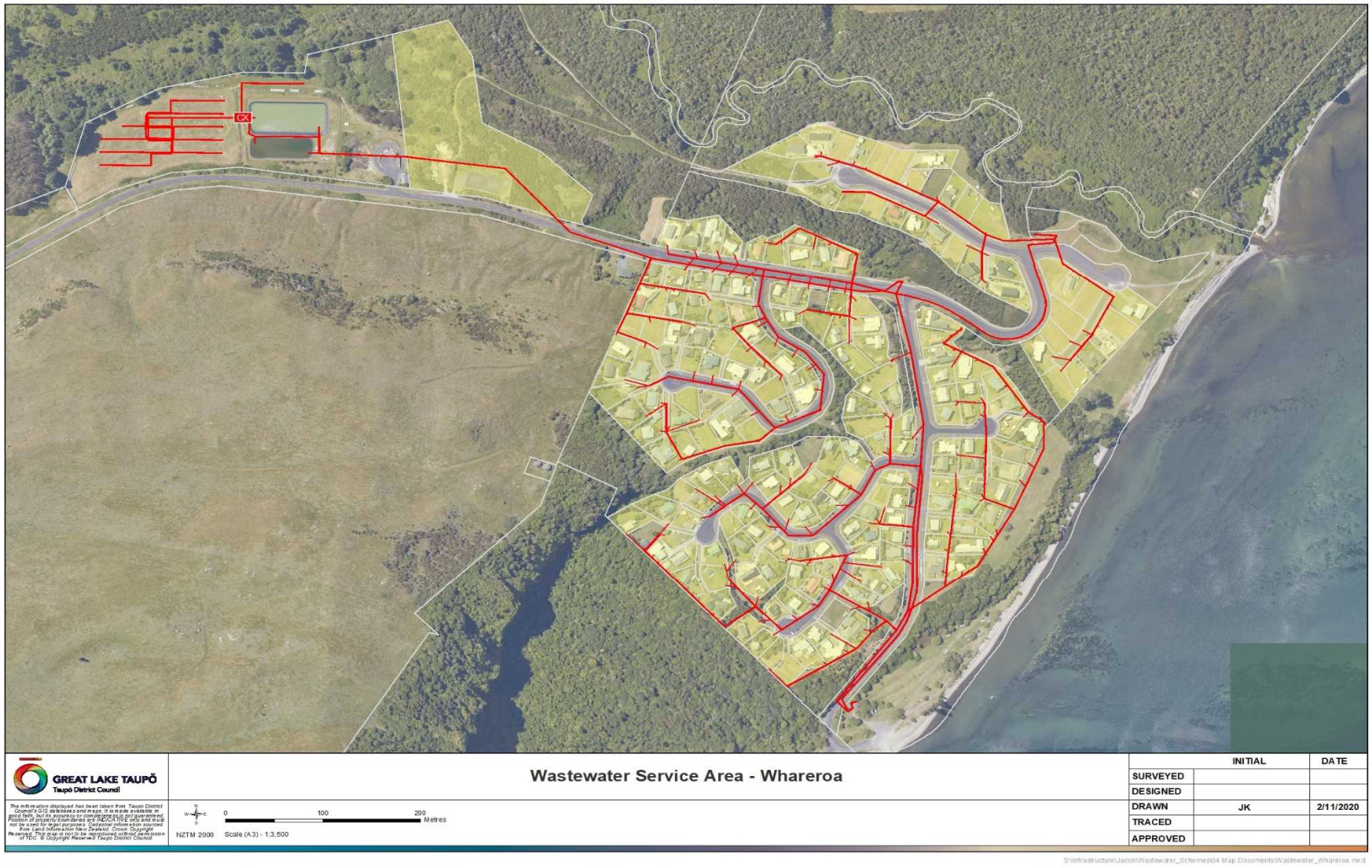
Reliability
During the past five years there were no blockages or root intrusion problems recorded for this scheme. Generally, the reticulation system is considered reliable.

Effluent Quality
Effluent quality is basic pond effluent standards and the growth of the irrigated crop is used to remove nitrogen before the wastewater enters the receiving environment. Monitoring well are established.

Operation and Maintenance Plan
Standard operation and maintenance information is provided in Section 8 of this Asset Management Plan.

DEVELOPMENT PLAN

No development projects are scheduled for Whareroa.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Project Name	**Atiamuri WWTP Upgrade**		
Description	The wastewater discharge consent expires in 2023 and it is likely that a WWTP upgrade for nutrient removal is required. The existing plant is not powered and provides no treatment other than simple solids settling.		
Business Owner	Michael Cordell	**BC Author**	Michael Cordell
Project Size	Lite	**Project Complexity**	Paint by Numbers
Programme	N/A	**Location**	Atiamuri

Strategic Objectives *(see appendix below to help score Strategic Objectives)*			
		Score	**Project Score Total**
Primary	Being Legislatively Compliant	5	8
Secondary	Protecting our Environment	3	
Background	Untreated wastewater from the Atiamuri community is being discharged to ground soakage. This approach to treatment and disposal is unlikely to be accepted in a new resource consent.		
Business Need	To ensure a long-term sustainable wastewater disposal process for the Atiamuri community of approximately 36 households. The scheme should be scalable to accept connection of other parts of the community.		

Benefits and Wellbeings (see appendix)

Benefit	**How will you quantify and track**	**Benefit Type**	**Wellbeing**
Legally compliant discharge	By meeting resource consent conditions	Environmental	Legislative Compliance
Environmental improvement (ground water)	By meeting resource consent conditions and through environmental monitoring	Environmental	Environmental improvement

Opportunity			
Scope	**In**		**Out**
	• WWTP upgrade for the existing community		• Gaining resource consent
Constraints	Gain resource consent Conditions of resource consent	**Assumptions**	Assumption is that a wastewater discharge consent will require an improvement in the treatment process
Dependencies	Wastewater discharge consent		
Stakeholders	Waikato Regional Council TDC Wastewater operations team Atiamuri community		
Change Mgmt.	Operations team will have a new asset to manage. They would have input into the equipment selection and would receive operation and maintenance instruction for the new plant.		
Risk of Doing	Criticism for not developing a solution for the whole community.	**Commentary**	System design can be modular to allow future expansion if it is not addressed in this project.
Risk of Not Doing	Illegal discharge	**Commentary**	Atiamuri is left without a legal wastewater disposal system

Options Analysis *(add more options if applicable)*			
	Option One: **Change Nothing**	**Option Two:** **Upgrade WWTP for the existing connections only**	**Option Three:** **Develop a wastewater reticulation and disposal system for the full Atiamuri community.**
Overview	The option of whether "do nothing", or carry on with the status quo, is a viable option, will be determined though the resource consenting process that precedes this construction project. The assumption is that an upgrade will be required.	Upgrade the WWTP to meet new resource consent conditions for the existing reticulated community only (36 houses).	Upgrade the WWTP to meet new resource consent conditions for the existing reticulated community only (approximately double the existing reticulated community).
Advantages	• No capital cost	• Meet consent conditions • Environmental improvement (groundwater)	• Meet consent conditions • Greater environmental improvement than Option2 • Better scale of economy (more rate payers)
Disadvantages	• Non-compliance and enforcement risk	• Capital cost • Half of community is still not provided for with reticulated wastewater and treatment	• Higher capital cost • The non-reticulated community has not been consulted with.
Costs	No increase in capital or operational cost. Excluding any enforcement costs.	Capex (treatment) $400,000 Opex $30,000 p.a.	Capex (treatment + reticulation) $1,100,000 Opex $50,000 p.a.
Achievability	N/A	Achievable	Achievable
Recommendation	**Option Two: Upgrade WWTP for the existing connections only.** Option two deals with the reconsenting issues at the minimum cost, any WWTP installed should be modular to allow expansion to allow for connection on the rest of the town in the future. Option 3 is not preferred at this stage, while there would be benefit to groundwater through additional wastewater collection and treatment the costs will be very high. Consultation the wider prior to the upgrade could mean Options 3 is achievable if there is support from the community and the community is willing to fund.		

RECOMMENDED OPTION

Delivery Approach – How will this initiative be delivered?

Gaining resource consent is a pre-requisite for this project.

This project will involve:

- Community consultation (Option 3 only - if required)
- Ground investigations
- Design
- Tender
- Construction

Project Outputs – the things the project is going to deliver	
Output	**Output Quality Details**
WWTP upgrade	Compliant with resource consent
Handover documentation	As-built records, O&M manuals

Key Risks – things that provide uncertainty in the project, focus on High risks if possible (see risk matrix in the appendix)			
Risk	**Likelihood**	**Impact**	**Score**
Uncertain consent conditions	Unlikely	Minor	4

Project Resource Requirements				
Role	Primary Responsibilities	Internal or External	Estimate average weekly hours on project	Duration (months)
Sponsor	Ensure benefits realisation.	Internal	0.25	18
Asset Manager / Asset Engineer	Scoping, planning, handover to delivery team, tender reviews, council paper.	Internal	8	3
Programme Delivery Manager	Appoint project manager, consultation, tender reviews, reporting, handover.	External (or new internal role)	0	0
Project Manager	Project Management	External	8	12
Engineers Rep / Site supervision	Site supervision, quality, H&S, witness tests etc	External	15	6
Operations Team Staff / Network Engineer	Interface with operational plant, training commissioning, handover	Internal	8	6
Iwi liaison support	Assist with relationship, consents etc…	Internal	2	3
Procurement support	Procurement	Internal	8	1
Communications support	Communication	Internal	1	6

Cost Estimate Summary – for recommended option	
Item	**Estimated Cost**
CAPEX	
WWTP construction including resourcing costs	**$ 400,000**
OPEX	
Power, operations costs, maintenance	$ 30,000 (estimate based on Whakamaru costs)
How accurate are your estimates? Costs fairly accurate (+/-10%) Cost certainty is low (+/- 50%) Costs are a high-level guess (+/-80%)	+/- 20% Fairly accurate as we have completed a recent project that is similar.
How will this proposal be funded? <Internally Externally, renewals funding, development contributions etc...>	New Capex

(give example of who) (i.e. transfer between existing divisional budgets) (i.e. no budgeted funding source)	

Timescale/Cost – give a summary of how the project phases will be delivered.										
LTP 2021-2031	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	**Y10**
Phase (Initiate, Plan, Execute)	Initiate	*Consent expires* Plan Execute								
Cost of phase and year spent	50,000	350,000								

Approval *If there's been a significant change in scope or change in cost/benefit*	
Approvers Name	<insert name of person approving as well as hyperlink to their approval>
Date	<Date of Approval>

Project Name	District Wide Wastewater Network Renewals		
Description	Routine wastewater network renewals to replace assets at end of life. This business case covers the renewal of wastewater network assets across the district including, gravity sewers, rising mains, manholes, pump stations and any other ancillary equipment.		
Business Owner	Michael Cordell	**BC Author**	Michael Cordell / James Aremu
Project Size	Lite	**Project Complexity**	Paint by Numbers
Programme	The BC includes multiple projects but is not a programme of work	**Location**	District Wide

Strategic Objectives *(see appendix below to help score Strategic Objectives)*			
		Score	**Project Score Total**
Primary	Level of Service	5	10
Secondary	Looking after Public Health and Safety	5	
Background	Renewal of assets at end of life.		
Business Need	To maintain the wastewater collection system in good condition to prevent risk of sewer overflows to maintain public health, and to avoid excessive inflows of rainwater to the wastewater treatment facilities.		

Benefits and Wellbeings (see appendix)

Benefit	**How will you quantify and track**	**Benefit Type**	**Wellbeing**
Community not exposed to wastewater and avoid illness	Counting the number of sewer overflows.	Social	Improved Public Health
Keeping waterways clean.	Counting the number of sewer overflows.	Environmental	Protecting our Waterways
Maintain / improve cultural wellbeing and reputation by reducing the incidence of wastewater entering waterways	Counting the number of sewer overflows.	Cultural	Legislative Compliance
Reduced reactive costs by having good condition sewers. Avoid bad publicity due to sewer overflows.	Counting the number of sewer overflows.	Economic	Cost Avoidance Brand Awareness

Opportunity	To improve sewer network performance that is poor in some areas.	
Scope	**In**	**Out**
	• Gravity sewers • Manholes • Wastewater pump stations and rising mains • Storage chambers • Electrical and SCADA equipment (network)	• Wastewater treatment plants • Wastewater disposal systems

Constraints	Budget	**Assumptions**	We have made some assumptions regarding asset condition as asset condition and performance data is not complete.
Dependencies	N/A		
Stakeholders	Water users, Tūwharetoa Maori Trust Board, Waikato Regional Council,		
Change Mgmt.	N/A		
Risk of Doing	• Some renewal actives may cause short term disruption to residents.	**Commentary**	Many assets are in private property.
Risk of Not Doing	• Increase is sewer overflows • Increase in reactive costs • Increase in storm flows to wastewater treatment facilities.	**Commentary**	

Options Analysis *(add more options if applicable)*			
	Option One: Keep current renewals budget	**Option Two: Increase renewals budget**	**Option Three: Greater increase in renewals budget**
Overview	Maintain the level of renewals expenditure that is in the current 10-year plan.	Slight increase to level of wastewater expenditure. This option include upgrade of the WWPS electrical and telemetry systems over 5-years; some complete renewals and some telemetry only.	Greater increase to level of wastewater expenditure. Accelerate upgrade of electrical and telemetry systems.
Advantages	Low expenditure forecast	Increased on current level of spending based on current knowledge and historical expenditures	Higher level of spending to address poor condition assets earlier reducing reactive costs in the medium to long term. More rapid conversion to the new telemetry system.
Disadvantages	Renewals expenditure is not likely to keep up with asset deterioration resulting in: - Increased reactive costs - Increased I&I - Increased overflows - Expectation of low spending may not be able to be sustained due to reactive costs.	The CCTV programme may show a greater level of expenditure is required sooner and this budget may not be adequate to address all issues in a timely manner. Expectation of low spending may not be able to be sustained due to reactive costs.	We are still in 'discovery mode' regarding condition of our wastewater network and not all projects, particularly pipe renewals are identified at this stage. However, we do expect that we will discover issues that require renewal and repair.
Costs	Average budget in year 1 – 3 was $1.87 million Average spend of $980,000 per year over the 10-year plan.	More heavily weighted in first 5 years (~$2.36 million) however may need to increase year 5 – 10 budgets as we learn more about asset condition. Average spend of $1.87 million per year over the 10-year plan (double existing plan).	Allow additional $300k year 1 – 3 to upgrade WWPS electrical and/or telemetry systems sooner. Allow additional $500k per year to allow for additional WWPS and pipe renewals.

Achievability	Maintaining this level of renewals budget is going to difficult to maintain as reactive renewals costs are increasing and exceeding budget is highly likely.	Achievable	Achievable
Recommendation	**Option Two: Increase renewals budget**		

RECOMMENDED OPTION

Delivery Approach – How will this initiative be delivered?

This budget will be delivered in several ways:

- Through routine replacements at end of life e.g. wastewater pumps
- Through the need to undertake reactive renewals e.g. should a wastewater rising main fail
- Through programmed renewals contracts e.g. pipeline relining contracts.

Project Outputs – the things the project is going to deliver

Output	Output Quality Details
N/A	N/A

Key Risks – things that provide uncertainty in the project, focus on High risks if possible (see risk matrix in the appendix)

Risk	Likelihood	Impact	Score
Not keeping up with asset renewals could create a large backlog of renewals that need to be completed. Uncertainty in asset condition. Whilst we have some condition data and have some feel for typical asset condition our condition assessment process (mainly for underground assets) has only recently been developed and therefore data quantity is low. Assets could be in better or worse condition than we expect.	Moderate	Moderate	Medium

Project Resource Requirements

Role	Primary Responsibilities	Internal or External	FTE Estimate	Duration Estimate
Sponsor	Ensure benefits realisation.	Internal	0.25	12
Asset Manager / Asset Engineer	Scoping, planning, handover to delivery team, tender reviews, council paper.	Internal	8	12
Programme Delivery Manager	Appoint project manager, consultation, tender reviews, reporting, handover.	External (or new internal role)	0	0
Project Manager	Project Management	External	8	12
Engineers Rep / Site supervision	Site supervision, quality, H&S, witness tests etc	External	15	12
Operations Team Staff / Network Engineer	Interface with operational plant, training commissioning, handover	Internal	8	12
Iwi liaison support	Assist with relationship, consents etc…	Internal	4	0

Procurement support	Procurement	Internal	8	1
Communications support	Communication	Internal	1	12

Cost Estimate Summary – for recommended option	
Item	**Estimated Cost Capital Cost (Year 1- 3 breakdown)**
Pipes and valves	$ 1,020,000
Manholes	$ 80,000
WWPS & Storage	$ 350,000
WWPS Electrical	$ 450,000
Other reactive renewals	$ 500,000
Total Estimated Capital Cost	**$ 2,400,000**
How accurate are your estimates? Costs fairly accurate (+/-20%) Fairly accurate as we can adjust the work programme to budget.	
How will this proposal be funded? Renewal reserves or loan funding	

Timescale/Cost – give a summary of how the project phases will be delivered.										
LTP 2021-2031	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	**Y10**
Phase (Initiate, Plan, Execute)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cost of phase and year spent	2,400,000	2,400,000	2,400,000	2,400,000	2,130,000	1,170,000	1,080,000	1,080,000	1,080,000	1,080,000

LTP Business Case 7 to 10 years

Project Name	Kinloch WWTP – Second bioreactor		
Description	Expansion of the Kinloch WWTP through addition of the second bioreactor.		
Business Owner	Michael Cordell	**BC Author**	Michael Cordell
Project Size	Medium	**Project Complexity**	Paint by Numbers
Programme	Nil	**Location**	Kinloch WWTP

Strategic Objective *(see appendix below to select primary and secondary)*			
		Score	**Project Score Total**
Primary	Protecting our environment	4	8
Secondary	Being legislatively compliant	4	
Background	During conversion of Kinloch WWTP to a membrane bioreactor one of the two SBR basins was converted to a simultaneous nitrification denitrification (SND) bioreactor. This project converts the second basin into an SND reactor and provides further capacity for growth in Kinloch. There is high uncertainty in project timing as the growth rate in Kinloch is currently far exceeding expectations. There is also uncertainty if this project will be needed. This depends on the nature (density) of future developments at Kinloch and the rate of infill construction that occurs.		
Business Need	Maintain adequate treatment standards and meet consent conditions as Kinloch grows.		
Option/s	1. Upgrade WWTP to allow for growth 2. Limit growth in Kinloch		
Benefits and Wellbeings	Environmental - Legislative compliance - Protecting our waterways		

Scope	**In**	**Out**	**Maybe**
	Bioreactor conversion to SND ditch and ancillary equipment	Resource consents Inlet works Membranes Irrigation systems (All complete in Stage 1)	

Potential Issues with preferred option	-
Risk of Doing Nothing	If wastewater volumes received exceed the limits of treatment capacity treatment performance will deteriorate.

Timescale/Cost – give a summary of how the project phases will be delivered.

LTP 2021-2031	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	**Y10**
Phase (Initiate, Plan, Execute)								Initiate Plan	Execute	

Cost of phase and year spent								50,000	1,000,000	

LTP Business Case 1 to 3 years

Project Name	Kinloch Wastewater Treatment Plant Upgrade to MBR		
Description	Upgrade of the existing WWTP to MBR technology to improve treatment performance.		
Business Owner	Michael Cordell	**BC Author**	Michael Cordell
Project Size	Medium	**Project Complexity**	Quest
Programme	-	**Location**	Kinloch WWTP

Strategic Objectives *(see appendix below to help score Strategic Objectives)*			
		Score	**Project Score Total**
Primary	Protecting our Environment	5	10
Secondary	Being legislatively compliant	5	

Background

The Kinloch WWTP is a twin tank Sequencing Batch Reactor (SBR) system and was built in late 1980s. The treatment plant has undergone several minor upgrades since this time however has not had a significant capacity upgrade.

A business case to convert the WWTP to MBR was prepared in 2019 and this was accepted. At the time of accepting the business case the need for additional funding was identified with additional funding need of between $1.96 million and $5.3 million; with a best estimate was that an additional $2.8 million required. This estimate was used to establish the project budget.

The project is currently underway and in the detailed design phase.

This is a multi-year project.
The project phasing was adjusted for the 2020 Annual plan and again for the 2021 LTP.
The current budget is project cost is as given below.

Project	2019/20	2020/21	21/22 (LTP Year 1)
Kinloch WWTP Capacity Upgrade	1,743,000	4,000,000	9,000,000

Membranes filtration equipment, inlet works equipment, and blowers have been procured. Some of these equipment costs are coming in at a higher cost than expected. Project management costs are also going to be greater than budgeted.

This business case will cover the LTP Year 1 project budget and allow enough budget estimate to complete the project.

Business Need

To meet resource consent condition for wastewater discharge and have adequate treatment plant capacity to cater for the growth expected in the Kinloch community.

Benefits and Wellbeings (see appendix)

Benefit	**How will you quantify and track**	**Benefit Type**	**Wellbeing**
Improved treatment performance, nitrogen and phosphorus removal	Measured treatment plant performance.	Environmental	Protecting our waterways Legislative compliance
		Economic	Legislative compliance

Opportunity	-		
Scope	**In**	**Out**	
	• Conversion of WWTP to MBR. Detailed scope provided in preliminary design report v3.	• Land disposal systems • Network improvements	
Constraints		**Assumptions**	Cost estimate assumed. Updated cost estimate being prepared by Beca Ltd following detailed design before the end 2020.
Dependencies	-		
Stakeholders	WW operations team.		
Change Mgmt.	Operation team training will be required for the change to the new WWTP.		
Risk of Doing		**Commentary**	
Risk of Not Doing	Project not completed and compliance not met.	**Commentary**	

Options Analysis *(add more options if applicable)*		
	Option One: **Change Nothing**	**Option Two:** **Upgrade WWTP to MBR**
Overview	Maintain the existing treatment facility as is.	Upgrade the WWTP facility to MBR to add capacity and improve treatment performance.
Advantages	No capex cost.	Improve WWTP capacity
Disadvantages	WWTP will not keep up with increasing flows and loads as the community grows. Highly likely resource consents will be breached and enforcement action from Regional Council will follow.	High financial cost in the short term.
Costs	Unknown. Likely fines and related compliance costs.	Total project cost in the order of $15.5 million. There is fairly good cost information for this project as major cost items are now known.
Achievability	Achievable with negative consequences.	Achievable.
Recommendation	Option 2.	

RECOMMENDED OPTION

Delivery Approach – How will this initiative be delivered?
As of 18/02/21 TDC has already procured design services, project management services, purchased a significant amount of the major equipment for the upgrade, and recently award Contract for the main upgrade works.

Project Outputs – the things the project is going to deliver	
Output	**Output Quality Details**
Upgraded WWTP	MBR, meeting the condition of resource consent.
All required project documentation	

Key Risks – things that provide uncertainty in the project, focus on High risks if possible (see risk matrix in the appendix)			
Risk	**Likelihood**	**Impact**	**Score**
Time – the project takes longer to compete that expected and the process can not be complete prior to Christmas of 2021.	Unlikely	Major	Medium
Project cost – all major cost items are known, and contracts awarded however there are potential for additional costs due to project variations.	Moderate	Minor	Medium
Compliance risk – during construction we will operate on reduced treatment plant capacity over winter months.	Moderate	Minor	Medium

Timescale/Cost – give a summary of how the project phases will be delivered.										
LTP 2021-2031	**Y-1**	**Y0**	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**
Phase (Initiate, Plan, Execute)	Initiate	Plan Execute	Execute							
Cost of phase and year spent	1,743,000	4,000,000	9,000,000							

LTP Business Case 4 to 6 years

Project Name	Mangakino WWTP Upgrade		
Description	Upgrade of Mangakino WWTP to include improved nitrogen removal		
Business Owner	Michael Cordell	**BC Author**	Michael Cordell
Project Size	Lite	**Project Complexity**	Movie
Programme	-	**Location**	Mangakino WWTP site

Strategic Objective *(see appendix below to help score Strategic Objectives)*			
		Score	**Project Score Total**
Primary	Protecting our Environment	4	8
Secondary	Being legislatively compliant	4	
Background	A wastewater discharge consent has been applied for to replace an expired discharge consent. There has been in increase in the amount of nitrogen being discharged from the WWTP over recent years due to increased population and activity in the town, and due to a reduction in leakage from the reticulated sewer network. The new consent will require that the increased nitrogen levels are reduced in order to reduce environmental degradation. As there will be a delay from granting of the consent until a WWTP is constructed WRC have suggested an 'environmental mitigation' project. This project is current proposed as in year 1 and 2 of the LTP with $30k in each year. A similar approach was used for the Whakamaru WWTP upgrade completed in 2019.		
Business Need	Council needs to maintain a wastewater treatment facility that complies with discharge consent conditions.		
Option/s	Upgrade to the wastewater treatment plant.		

Benefits and Wellbeings *(see appendix)*

Benefit	**Benefit Type**	**Wellbeing**
Comply with discharge consent	Legislative Compliance	Environmental
Reduce nutrients entering Lake Maraetai	Protecting our waterways	Environmental
Reduce wastewater impacts on waterways (less culturally acceptable)	Legislative Compliance	Cultural

Opportunity	-		
Scope	**In**	**Out**	**Maybe**
	• WWTP upgrade • Design	• Consenting (will already be complete) • Consultation (will be completed as part of consent process) • Mitigation will be a stand-alone project (this project is funded via opex).	•
Constraints	•	**Assumptions**	That the date of the upgrade proposed is acceptable to WRC and to other stakeholder (TBC during the consent phase)

Dependencies	• Resource consent	**Stakeholders**	Iwi and hapu Waikato Regional Council MPRG Council
Potential Issues with the preferred option	The consent has not been granted yet and consultation is still occurring. The scope of the project could increase or timing change.		
Risk of Not Doing	Breach of consents; reputational damage, legal risk.		

Project Outputs – the things the project is going to deliver	
Output	**Output Quality Details**
WWTP upgrade	
Close-out documentation	
Asbuilts and O&Ms	
Operator training	

Cost Summary	
Item	**Estimated Cost**
CAPEX	
WWTP construction including resourcing costs	$ 1.8 million
OPEX	
Septic tank decommissioning	$ est. 1,000,000 One-off cost (to confirm with operations team and include in ops team budgets if required)
Operation costs	Not assessed however not likely significant change vs current operations. Slight increase in maintenance. Mitigation project costs included in Opex budgets.
How accurate are your estimates? Costs fairly accurate (+/-10%) Cost certainty is low (+/- 50%) Costs are a high-level guess (+/-80%)	+/- 30%

Timescale/Cost – give a summary of how the project phases will be delivered.										
LTP 2021-2031	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	**Y10**
Phase (Initiate, Plan, Execute)			Initiate, Plan	Execute						
Cost of phase and year spent			100,000	1,800,000						

Project Name	**Motutere wastewater treatment plant upgrade**		
Description	The project will provide additional capacity at the WWTP to allow for growth at the campground and connection of the Motutere Point community.		
Business Owner	Michael Cordell	**BC Author**	Michael Cordell
Project Size	Lite	**Project Complexity**	Paint by Numbers
Programme	-	**Location**	Motutere

Strategic Objectives *(see appendix below to help score Strategic Objectives)*			
		Score	**Project Score Total**
Primary	Protecting our Environment	3	6
Secondary	Placemaking	3	
Background	The Motutere WWTP currently serves only the Motutere Campground. Council cannot practically limit the flows and loads generated by the WWTP and should further growth occur an upgrade treatment process will be required to continue to meet consent conditions. The Motutere Point community also aspires to redevelop their community housing and as a part of this would like to improve wastewater If the Motutere Point community connects the WWTP an upgrade to the treatment works is certainly required. If the Motutere Point community does not connect to the WWTP the need to upgrade the treatment plant is dependant on the continued growth of the Motutere Campgrounds operation. **The future ownership of the campground and WWTP needs to be considered alongside the decision to commit to this project and connection to the WWTP.**		
Business Need	To maintain a legally compliance wastewater discharge.		

Benefits and Wellbeings (see appendix)			
Benefit	**How will you quantify and track**	**Benefit Type**	**Wellbeing**
Manage the amount of nitrogen entering Lake Taupo	Compliance with resource consents.	Environmental	Protecting our waterways

Opportunity	There is the opportunity is to consider the future ownership of the campground and WWTP needs to be considered alongside the decision to commit to this project and connection to the WWTP.	
Scope	**In**	**Out**
	Increase WWTP - Additional SAF - Clarifier (if required)	Reticulation of Motutere Point community (separate business case).

	- Carbon bed - Ancillary works		
Constraints	Consent conditions. Even with WWTP upgrade consent conditions will remain a limitation to growth.	**Assumptions**	Campground growth continues Motutere Point community.
Dependencies	Agreement with Motutere Point Community		
Stakeholders	Motutere Point Community Campground operator Councillors		
Change Mgmt.	-		
Risk of Doing	Council continues to invest significant on an asset which it may not own in the future. Consider long term future of the campground. The upgrade proposed does not provide nitrogen removal for the peak flow period.	**Commentary**	The upgrade will still not be able to adequality treat peak flows. The treatment plant upgrade proposed will only remove nitrogen during off peak periods.
Risk of Not Doing	Campground continues growth and compliance with resource consent becomes difficult. Motutere Point community cannot connect to the WWTP.	**Commentary**	-

Options Analysis *(add more options if applicable)*			
	Option One: **Change Nothing**	**Option Two:** **Upgrade of WWTP**	**Option Two:** **Manage campground growth** **Stand alone treatment for Motutere Point Community**
Overview	This option retains the status-quo.	Upgrade the WWTP to allow for growth at the campground and connection of Motutere Point community.	This option will look to work with the campground operator to manage growth (waste loads) to the WWTP. The Motutere Point community may be able to develop and consent its own WWTP.
Advantages	No capital expenditure	Allows continued growth at the campground (but still with some compliance risk that needs to be managed). Allows connection of Motutere Point community.	Maintains separation of the campground activity from the Motutere Point community allows independent decision making.
Disadvantages	Connection of the Motutere Point community is not possible.	Council expenditure is largely not recouped. Council may invest in an asset it may not own long term.	New consent required for Motutere Point community WWTP (consenting risk).

	Campground may continue grow and put additional pressure on the WWTP potentially overloading the WWTP and creating compliance problems.	The upgrade will still not be able to adequality treat peak flows. Modelling and risk assessment are required to confirm plant performance.	
Costs	Nil	Approximately $500k.	Estimated costs of $200 – 300k over and above the cost to reticulate the Motutere Point community.
Achievability	Possible option but might be difficult to manage campground waste loads.	Achievable. Least risk but high cost option.	Possible option but might be difficult to manage campground waste loads. Consenting risk for Motutere Point community.
Recommendation	Option Two: Upgrade of WWTP to allow connection of Motutere Point Community and campground growth. However, agreement with all parties will be required as this is not a sole Council decision due to the management of the land on which the campground site changing.		

RECOMMENDED OPTION

Delivery Approach – How will this initiative be delivered?
Consultation will be required with landowner. Assume typical design, tender, construct capital works project.

Project Outputs – the things the project is going to deliver	
Output	**Output Quality Details**
Upgraded WWTP	An upgrade plant will provide 50% additional treatment capacity.
Asbuilts	
O&Ms	

Key Risks – things that provide uncertainty in the project, focus on High risks if possible (see risk matrix in the appendix)			
Risk	**Likelihood**	**Impact**	**Score**
Reduction in scope after tender process would impact on projected revenue benefits	Likely	Moderate	High
Going beyond expected delivery timeframe, which effects any promotional comms and opening days	Moderate	Major	High

Project Resource Requirements				
Role	**Primary Responsibilities**	**Internal or External**	**FTE Estimate**	**Duration Estimate**
Sponsor	Ensure benefits realisation.	Internal	0.25	6
Asset Manager / Asset Engineer	Scoping, planning, handover to delivery team, tender reviews, council paper.	Internal	8	2

Programme Delivery Manager	Appoint project manager, consultation, tender reviews, reporting, handover.	External (or new internal role)	0	0
Project Manager	Project Management	External	8	6
Engineers Rep / Site supervision	Site supervision, quality, H&S, witness tests etc	External	15	3
Operations Team Staff / Network Engineer	Interface with operational plant, training commissioning, handover	Internal	8	0
Iwi liaison support	Assist with relationship, consents etc…	Internal	4	1
Procurement support	Procurement	Internal	8	1
Communications support	Communication	Internal	1	1

Cost Estimate Summary – for recommended option	
Item	**Estimated Cost**
P&G	31,734
WWTP Upgrade	317,338
WORKS TOTAL	**349,072**
Professional Fees	34,907
Contingency	76,796
Project Management	34,907
TOTAL	**495,682**
How accurate are your estimates? Costs fairly accurate (+/-10%) Cost certainty is low (+/- 30%) Costs are a high-level guess (+/-80%)	
How will this proposal be funded? <Internally Externally, renewals funding, development contributions etc...> (give example of who) (i.e. transfer between existing divisional budgets) (i.e. no budgeted funding source)	

Timescale/Cost – give a summary of how the project phases will be delivered.										
LTP 2021-2031	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	**Y10**
Phase (Initiate, Plan, Execute)	Initiate	Plan	Execute							
Cost of phase and year spent	X	X	500,000							

Project Name	**Taupo Wastewater Waikato River Crossing (Control Gates Bridge)**		
Description	This project will increase the capacity of the network to convey wastewater from the North Side of the Waikato River to the WWTP.		
Business Owner	Michael Cordell	**BC Author**	Michael Cordell
Project Size	Medium	**Project Complexity**	Quest
Programme	-	**Location**	Waikato River

Strategic Objectives *(see appendix below to help score Strategic Objectives)*			
		Score	**Project Score Total**
Primary	Protecting our Environment	5	10
Secondary	Looking after Public Health and Safety	5	
Background	The growth on the Northern side of the Waikato River drives the need additional wastewater capacity over the Waikato River.		
Business Need	To service the zoned residential growth areas north side of the Waikato River. The Nukuhau Plan change requires completion of this this project before development could occur. Without additional wastewater capacity over the Waikato River, growth on the Northern side of the river should stop otherwise wastewater overflows will become regular occurrences.		

Benefits and Wellbeings (see appendix)			
Benefit	**How will you quantify and track**	**Benefit Type**	**Wellbeing**
Reduce likelihood over overflows causing environmental damage	Track no. of overflows	Environmental	Protect Waterways
Reduce likelihood over overflows causing health risk	Track no. of overflows	Social	Improved Public Health
Allows growth to continue the North side of the Waikato River.		Economic	Allows growth
Project will work with Maori community/stakeholders to identify best culturally acceptable outcome possible.		Cultural	Culturally acceptable solution needed

Opportunity	Opportunity to consider a joint project to use a pipe bridge as a cycling or walking path. Combine project with second Waikato River Bridge Crossing (timing does not appear to be sufficiently aligned).		
Scope	**In**		**Out**
	• Additional pipe over the Waikato River • The project will allow for capacity to service the Acacia Bay area and the possible 'Brodie Block' subdivision.		• Any other upgrade in the network in the vicinity.
Constraints	Limited space on the existing bridge	**Assumptions**	Capacity will be allowed for the Acacia Bay and Brodie Block area. The Nukuhau structure plan growth area is allowed for. Other areas not zoned for growth are not allowed for.
Dependencies			
Stakeholders	Public, Iwi (related to the Waikato river specifically), Council, Mercury Energy		

Change Mgmt.			
Risk of Doing	Accidental spill during construction. Likelihood of significant resistance from Iwi related to additional wastewater pipework crossing the river.	**Commentary**	
Risk of Not Doing	Overflows to Waikato River due to under capacity	**Commentary**	

Options Analysis *(add more options if applicable)*				
	Option One: Change Nothing	**Option Two – New Pipe Bridge**	**Option Three – Other River crossing Options**	**Option Four – New WWTP North side of River**
Overview	This option will see growth on the Northern side of the river continue and no upgrade to the sewer capacity over the bridge.	This option will provide a new pipe bridge structure over the Waikato River adjacent to the Control gates bridge and will support a new wastewater main.	There are several other options still being explored including fixing a new pipe to the existing bridge of upsizing one of the existing pipes.	This option consider construction of a new WWTP and land disposal system north side on the Waikato River.
Advantages	• Nil	• Provides capacity for growth on the northern side of the River. • Certainty, the project can be delivered from a technical standpoint	• Other option might mean an additional structure across the river is not needed resulting in cost savings and visually better.	• No new Waikato River crossings • Removal of existing pipework from crossing the river. • Reduce
Disadvantages	• Overflows to the river increasing over time • Environmental risks • Health risks • Enforcement action	• Consultation with stakeholders has not yet occurred.	• The viability of other options has not been confirmed (work in progress)	• High costs • Long time to deliver, new consent required.
Costs	Not measurable	Capital cost $ 1,750,000 + GST Cost uncertainty.	TBC	Ballpark figure $20 - 30 million+ land purchase / lease.
Achievability	Do nothing is not an option unless growth on the Northern Side of the river is halted.	Technically achievable. Waiting for the outcome of stake holder engagement, resistance is expected.	TBC	Uncertain.
Recommendation	Option 2 will be used for budgeting purposes as there is certainly it can be technically achieved. Other options will continue to be explored and stakeholder engagement may lead to a different solution.			

RECOMMENDED OPTION

Delivery Approach – How will this initiative be delivered?

This is likely a normal design, tender and construct process [TBC].

Project Outputs – the things the project is going to deliver

Output	Output Quality Details
Additional pipe capacity over the Waikato river.	
TBC	

Key Risks – things that provide uncertainty in the project, focus on High risks if possible (see risk matrix in the appendix)

Risk	Likelihood	Impact	Score
Reduction in scope after tender process would impact on projected revenue benefits	Likely	Moderate	High
Going beyond expected delivery timeframe, which effects any promotional comms and opening days	Moderate	Major	High

Project Resource Requirements

Role	Primary Responsibilities	Internal or External	FTE Estimate	Duration Estimate
Sponsor	Ensure benefits realisation.	Internal	0.25	18
Asset Manager / Asset Engineer	Scoping, planning, handover to delivery team, tender reviews, council paper.	Internal	8	3
Programme Delivery Manager	Appoint project manager, consultation, tender reviews, reporting, handover.	External (or new internal role)	0	0
Project Manager	Project Management	External	8	12
Engineers Rep / Site supervision	Site supervision, quality, H&S, witness tests etc	External	15	6
Operations Team Staff / Network Engineer	Interface with operational plant, training commissioning, handover	Internal	8	6
Iwi liaison support	Assist with relationship, consents etc…	Internal	4	3
Procurement support	Procurement	Internal	8	1
Communications support	Communication	Internal	1	6

Cost Estimate Summary – for recommended option

Item	Estimated Cost
CAPITAL COST	
Pipe bridge with DN550 sewer main	$1,850,000
OPEX COSTS	
Occasional visual inspection	Low cost
CCTV inspection	Low cost
How accurate are your estimates? Cost certainty is low (+/- 50%)	

How will this proposal be funded? <Internally Externally, renewals funding, development contributions etc...>
(give example of who) (i.e. transfer between existing divisional budgets) (i.e. no budgeted funding source)

Timescale/Cost – give a summary of how the project phases will be delivered.										
LTP 2021-2031	**Y0**	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**
Phase (Initiate, Plan, Execute)	Plan	Execute								
Cost of phase and year spent	100,000 (Current year budget)	1,750,000								

LTP Business Case 7 to 10 years

Project Name	Taupo Wastewater – Expansion of the Effluent Irrigation System		
Description	Expansion of Taupo wastewater disposal system		
Business Owner	Michael Cordell	**BC Author**	Michael Cordell
Project Size	Medium	**Project Complexity**	Movie
Programme	-	**Location**	Taupo - Near View Road irrigation site

Strategic Objective *(see appendix below to select primary and secondary)*			
		Score	**Project Score Total**
Primary	Protecting Our Environment	4	9
Secondary	Being Legislatively Compliant	5	
Background	Nutrient loading limits (nitrogen and phosphorus) when applied to ground are tightening as Regional Council Plans look towards improved freshwater standards. The View Road discharge consent expires in 2032 and it is highly likely that effluent loading rates will reduce and therefore additional land area will be required.		
Business Need	To have a long term sustainable effluent disposal method for the Taupo community.		
Option/s	➢ Do nothing (significant compliance issues) ➢ Upgrade the Taupo WWTP to provide nutrient removal (significant expense and less benefits) ➢ Expand irrigation system		
Benefits and Wellbeings			

Scope	**In**	**Out**	**Maybe**
	- Land purchase - Preparation of the irrigation land - Centre Pivot Irrigators - Haulage Road - New Irrigation Pump station	- Consenting	- New storage pond

Potential Issues with preferred option	This is currently proposed for land that TDC does not own or have a discharge consent for.
Risk of Doing Nothing	If the land is not acquired and irrigation solution is not developed prior to expiry of the there will be a period of operating on lapsed consent while a solution is developed.

Timescale/Cost – give a summary of how the project phases will be delivered.

LTP 2021-2031	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	**Y10**
Phase (Initiate, Plan, Execute)										
Cost of phase and year spent							7,000,000			7,000,000

LTP Business Case 4 to 6 years

Project Name	Taupo wastewater – Primary Settling Tank #3		
Description	A third Primary Settling Tank (PST) is required to maintain adequate wastewater treatment standards.		
Business Owner	Michael Cordell	**BC Author**	Michael Cordell / James Aremu
Project Size	Medium	**Project Complexity**	Movie
Programme	Taupo WWTP Expansion Programme	**Location**	Taupo WWTP

Strategic Objective *(see appendix below to help score Strategic Objectives)*			
		Score	**Project Score Total**
Primary	Protecting our Environment	5	10
Secondary	Looking after Public Health and Safety	5	
Background	The primary treatment area currently incorporates two primary sedimentation tanks and as wastewater flow to the plant increase additional capacity is required to maintain plant performance. The primary tanks are at capacity and as influent flows increase the performance of these units can be expected to slowly deteriorate over time. A third PST is required as the Taupo community grows, and wastewater flow rates increase. Reference: Taupo Wastewater Treatment Plant Expansion Preliminary Design Report (AWT), 2009.		
Business Need	The capacity of the existing primary settling tank (PST) is at its hydraulic capacity therefore a third PST is required to maintain adequate settling performance.		
Option/s	The options are around timing of the upgrade rather than the type of upgrade to be undertaken. The upgrade could be deferred however there is risk of overloading of downstream unit processes. Options to change the type of wastewater treatment process are not considered.		

Benefits and Wellbeings *(see appendix)*		
Benefit	**Benefit Type**	**Wellbeing**
Proving reliable wastewater that will protect the environment	Protecting the environment	Environmental
Providing high quality wastewater that prevents public health issues	Improve Public Health	Social
Adding another PST will improve/maintain the overall plant efficiency	Maintaining level of service	Social

Opportunity	Nil		
Scope	**In**	**Out**	**Maybe**
	• Planning & feasibility study of the new site within the current treatment plant (partially completed). • Design and construction of a third PST. • Electrical, control and automation upgrades associated with the addition of third PST.	• Land acquisition for constructing the new PST • Any improvements Upgrade of existing PSTs.	Structural assessments of existing PST assets and any improvements needed to these.
Constraints	• Funding of the project may be a constraint.	**Assumptions**	• There is sufficient land to construct the third PST.

	• Depending on project timing, resources could be a constraint. • External project management would be required		• Growth forecasts are accurate.
Dependencies	None	**Stakeholders**	Senior management, Councillors, Taupo Residents/Customers, TMTB, Project Team (TDC staff and Consultants), TDC Wastewater Treatment Operation Team.
Potential Issues with the preferred option	Geotechnical risk considering location near the Waikato River.		
Risk of Not Doing	• Deteriorating treatment performance that could affect downstream treatment processers. • Reduce the overall plant efficiency, operational risk. • Consent compliance risks (related to irrigation sites).		

Project Outputs – the things the project is going to deliver	
Output	**Output Quality Details**
Planning and design	Detailed design and cost estimate from engineers
Addition of the PST #3	Built to relevant codes and following quality procedures. Adding the third PST to protect the environment.
Hand over documentation	As-built records, O&M manuals, Operators Training

Project Resources – Role Name	**Internal/External**	**Primary Responsibility**
Sponsor	Internal	Ensure benefits realisation
Asset Manager (Wastewater)	Internal	Scoping, planning, handover to delivery team, tender reviews, council paper.
Programme Delivery Manager	External	Appoint project manager, consultation, tender reviews, reporting, handover
Project Manger	External	Project Management
Engineers Rep/Site supervisor	External	Site supervision, quality, H&S, witness tests etc
Operations team Staff	Interface with operational plant, training commissioning, handover	Internal
Network Engineer	Interface with network, design reviews, training, commissioning, handover	Internal

Item	**Estimated Cost**
CAPEX	
Primary Settling Tank 3	$ 2,100,000
OPEX	
Electrical, maintenance, operations	$ 5,000 p.a.

Timescale/Cost – give a summary of how the project phases will be delivered.										
LTP 2021-2031	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	**Y10**
Phase (Initiate, Plan, Execute)			Initiate Plan	Execute						

Cost of phase and year spent			200,000	1,900,000						

APPENDIX

Project Complexity

Benefits and Wellbeings

Social	Economic	Environmental	Cultural
Improved Public Safety	Cost Reduction	Legislative Compliance	Legislative Compliance
Improved Public Health	Revenue Growth	Reduction in Water Usage	Treaty Settlement Acknowledgement
Legislative Compliance	Revenue Protection	Waste Reduction	Improved Cultural Understanding
Customer Satisfaction	Cost Avoidance	Emissions Reduction	Improve Community Engagement
Empowering People	Process Efficiency	Protecting our Waterways	
Improving Relationships	Brand Awareness	Reduced Emission/Carbon Zero Initiative	
Improve Community Interaction	Legislative Compliance	Improve or Promoting District Sustainability	
Increasing Educational Opportunities	Improve Process Efficiency	Reduced Congestion	
Improve Level of Service	Improve Community affordability		
Increase Community Offerings	Enabling Sustainable Growth		
Improve Community Engagement			
Improve Community Affordability			
Increased Accessibility			
Improved Resilience and Preparedness			
Reduced Congestion			

Strategic Objectives Scoring

Looking after Public Health and Safety

Score	Criteria	Example Project/s
1	Failure to do this project could have a minor impact on the public's health and safety and affect a small number of people	Surface repairs on the velodrome track
2	Failure to do this project could have a moderate impact on the public's health and safety and affect a small number of people	
3	Failure to do this project could have a moderate impact on the public's health and safety and affect a large number of people	
4	Failure to do this project could have a severe impact on the public's health and safety and affect a small number of people	
5	Failure to do this project could have a severe impact on the public's health and safety and affect a large number of people	Water treatment plant upgrade in one of our three main centres

Maintaining Levels of Service

Score	Criteria	Example Project/s
1	This project ensures we can continue to deliver services which are used by a small group of people	Reseal of a club car park, or neighbourhood playground renewal
2	This project ensures we can continue to deliver services which are used by a suburb or neighbourhood	
3	This project ensures we can continue to deliver services which are used by the town or a community	
4	This project ensures we can continue to deliver services which are used by the District	Online LIMS or other online services
5	This project ensures we can continue to deliver services which are Critical for the town/District to Operate	Taupo Water Treatment Plant membrane filtration upgrade

Being Resilient and Prepared

Score	Criteria	Example Project/s
1	Doing this project enables us to respond quickly to a loss of services for a few people	Development of a business continuity plan for a small community or group of people
2	Doing this project reduces the chances of losing services which effects a few people	
3	Doing this project enables us to respond quickly to a loss of services for a small group of people	
4	Doing this project reduces the chances of losing services which affect a small group of people	
5	Doing this project reduces the chances of losing services which are critical for the town/district to operate	Capacity Upgrade of Town Water Treatment Plant, Larger community reservoir construction and burst control valves. Certain Online Services

Being Legislatively Compliant

Score	Criteria	Example Project/s
1	Doing this is best practice	Stormwater improvement devices - downstream defender
2	We have a legislative or regulatory responsibility to undertake this project, however not doing it will have minor impact and is unlikely to result in prosecution	
3	We have a legislative or regulatory responsibility to undertake this project, however not doing it will have a moderate impact and may result in prosecution	Fixing Data related to 3 Waters consent conditions
4	We have a legislative or regulatory responsibility to undertake this project, however not doing it will have a major impact and is likely to result in prosecution	Upgrading water schemes to be compliant with NZDWS
5	Doing this **now** is absolutely mandatory and prosecution is certain	LTP, Annual Plan

Internal Innovation

Score	Criteria	Example Project/s
1	This project leads to minor internal operational efficiencies (such as time and cost savings) through innovative ways of doing things or contributes to an improved employee experience for some employees	Rostering software for a team
2	This project leads to moderate internal operational efficiencies through innovative ways of doing things	Implementation of Smart Trak or Priava booking software
3	This project leads to moderate internal operational efficiencies through innovative ways of doing things that improve our external customer experience	Implementation of online booking forms for Customers
4	This project leads to significant internal operational efficiencies through innovative ways of doing things or contributes to an improved employee experience for all employees	RFID implementation at the library
5	This project leads to significant internal operational efficiencies through innovative ways of doing things that improve our external customer experience	Implementation of Online Property Files and LIMS

Protecting our Environment

Score	Criteria	Example Project/s
1	This project increases our reputation as an environmentally responsible organisation	Enviropods or Roof water recycling tanks for any new buildings
2	This project promotes environmental sustainability or provides a mitigation or adaption to climate change	
3	This project will ensure we are compliant with environmental conditions and/or new environmental standards	Stormwater improvement devices - downstream defender
4	Failure to do this project may lead to prosecution or negative publicity due to environmental damage which will damage our reputation	
5	Failure to do this project will lead to major environmental damage with long lasting effects	Wastewater rising-main (pressure pipe) renewals beside the lake. Those that have failed so now need to be renewed

Economic Development

Score	Criteria	Example Project/s
1	This project will contribute to economic development however the scale is unknown or has not been quantified	Mangakino Sports Changing Facilities
2	This project will contribute to minor economic development or enable another minor economic development project to realise its benefits	
3	This project will contribute to moderate economic development or enable another moderate economic development project to realise its benefits	
4	This project will contribute to significant economic development or enable another significant economic development project to realise its benefits	Great Lake Walkway
5	This project will contribute to ongoing major economic development such as the creation of new jobs, town spend to a value >$1m/year	Ironman, Cycle Challenge

Placemaking

Score	Criteria	Example Project/s
1	Doing this project will enhance the attractiveness of an existing area	Neighbourhood playground renewal
2	Doing this project will provide a positive outcome that enhances the vibrancy and connectedness of the town or community	CBD/Intersection Upgrades
3	Doing this project will provide a positive outcome that enhances the vibrancy and connectedness of a District	
4	Doing this project will create a positive nationwide reputation and leave a lasting legacy for our people	
5	Doing this project will create a positive worldwide reputation and leave a lasting legacy for our people	Otumuheke Hot Pools

Risk Matrix

Likelihood	Consequences				
	Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
Almost Certain 5	Medium	Medium	High	Extreme	Extreme
Likely 4	Low	Medium	High	High	Extreme
Moderate 3	Low	Medium	Medium	High	High
Unlikely 2	Insignificant	Low	Medium	Medium	Medium
Rare 1	Insignificant	Insignificant	Low	Low	Medium

LTP Business Case 1 to 3 years

Project Name	Southern Trunk Sewer Capacity Upgrade		
Description	The Southern Trunk Sewer Capacity Upgrade project will provide the capacity needed to move wastewater from Taupo southern growth area to Taupo WWTP.		
Business Owner	Michael Cordell	**BC Author**	Michael Cordell / Colin Meadowcroft
Project Size	Medium	**Project Complexity**	Movie
Programme	Staged upgrade	**Location**	Between Wharewaka and Taupo CBD

Strategic Objectives *(see appendix below to help score Strategic Objectives)*			
		Score	**Project Score Total**
Primary	Looking after public health and safety	5	10
Secondary	Being resilient and prepared	5	
Background	The growth areas in Southern Taupo, as defined by TDC2050, drives the need to provide additional capacity to convey wastewater to the Taupo WWTP. The 2017/18 LTP included projects to continue with staged upgrades to the Southern trunk main. Before commencing this work, we have paused to review the upgrade options as upgrade of the trunk as the option of upgrading on the existing alignment involves complex construction and will cause significant disruption to property. Bypass pumping options are also to be considered. Prior to continue with upgrade of the trunk sewer, an options review was undertaken with alternative options considered.		
Business Need	The business is to provide adequate wastewater network capacity to convey wastewater to provide for growth areas. Failure to provide this capacity will result in a greater overflows risk increasing in time.		

Benefits and Wellbeings (see appendix)

Benefit	**How will you quantify and track**	**Benefit Type**	**Wellbeing**
Reduce likelihood overflows causing environmental damage		Environmental	Protect Waterways
Reduce likelihood of overflows causing health risk		Social	Improved Public Health
Allows growth to continue in Taupo South		Economic	Allows growth
Reduce risk of overflow to water way.		Cultural	Culturally acceptable solution needed

Opportunity	Opportunity exists to examine each option further to determine the selected option is the best fit for TDC in the longer term.	
Scope	**In**	**Out**
	• Pipeline upgrade • Sewer diversions • New WWPS • Additional wastewater storage • Corrosion investigation and implementation of solution • Upgrade of PS storage where required.	• Renewal of existing assets

Constraints	Private property access Suitable locations for WWPS and storage	**Assumptions**	Currently zoned growth areas only. No land purchase is required (pump station location).
Dependencies			
Stakeholders	Property owners effected by the upgrade Councillors / SLT TDC Policy team TDC Roading team TDC land development team		
Change Mgmt.			
Risk of Doing	Depending on the option selected; there is a risk of private property damage.	**Commentary**	Option 1 solution is highly risky and uncertain
Risk of Not Doing	Overflow risk increases as development in the Southern area continues.	**Commentary**	Could be reduced in the short-term with additional storage and bypass arrangements

Options Analysis *(add more options if applicable)*			
	Option One: **Upgrade of the gravity sewer network**	**Option Two:** **Bypass pumping and storage - (2.5xADWF pumped only)**	**Option Three:** **Bypass pumping and new trunk sewer (5xADWF pumped only)**
Overview	Upgrade of the gravity trunk sewer on existing alignment. This option will include major works within private property and cause significant disruption. New, or upgraded pipe bridges over multiple gullies.	Provide additional capacity that bypasses the need to upgrade the trunk sewer line. New pump station(s) will be utilized to provide a bypass solution. Storage is required to attenuate peak flows.	Provide additional capacity that bypasses the need to upgrade the trunk sewer line. New pump station(s) will be utilized to provide a bypass solution at Stage 1. Stage 2 (if required) will involve construction of a new trunk sewer from Riffle Range Road through to the WWTP.
Advantages	Existing alignment maximises the use of gravity sewer. Reduced risk and cost associated with pumping. Potential to provide greater capacity for increased growth to the Southern area however growth beyond TDC2050 is unlikely to occur.	Lower disturbance to private property. Lower risk of damage to private property damage. Lower capex. Construction could likely begin more quickly than Option 1. Increased resilience as wastewater from the Southern area will be conveyed via 2 separate routes.	Lower disturbance to private property. Lower risk of damage to private property damage. Lower capex. Construction could likely begin more quickly than Option 1. Can be constructed over two stages. Increased resilience as wastewater from the Southern

			area will be conveyed via 2 separate routes.
Disadvantages	All capacity contained in one trunk sewer i.e. limited resilience if failure occurs (Lake Terrace incident). Major disruption to private property and may not be practically achievable. Largest cost uncertainty.	Reliance on pump stations (requirements for good telemetry, emergency storage and generators). Limited further growth potential beyond the existing identified growth areas. Higher risk of overflows due to a less conservative design. Increased opex and maintenance.	Reliance on pump stations (requirements for good telemetry, emergency storage and generators). Increased opex and maintenance.
Costs	High level costs with significant uncertainty. Stage 1: $2,306,111 (475dia) Stage 2: $4,868,703 (475dia) Stage 3: $2,562,650 (475dia) Stage 4: $7,981,553 (600dia) Total Capex over all stages: **$17,700,000.** +25% for 95%ile cost estimate.	Total Capex over one stage: $**10,000,000.** +25% for 95%ile cost estimate.	Less cost uncertainty than Option#1. Stage 1: $10,250,000 Stage 2: $7,000,000 Total Capex over all stages: **$17,250,000.** +25% for 95%ile cost estimate.
Achievability	Achievable but very complex given physical constrains and will cause significant damage to private property.	Achievable, though careful planning needed. Most easily achieved.	Achievable. Can be staged. though careful planning needed.
Recommendation	The preferred option is likely to be Option 3 delivered in a staged a manor. **At present, Option 3 is conservatively sized at 5xADWF and this will be further refined, looking at achieving balance between pipe size, pump size, storage and the LoS required.** The ultimate solution could be somewhere between Option 2 and Option 3.		

RECOMMENDED OPTION

Delivery Approach – How will this initiative be delivered?
The first stage of the project is to continue to work on options assessment to refine the preferred solution; by considering pipe and pump capacity alongside storage capacity. Thought also needs to be given to what is an acceptable level of service for wastewater overflow i.e. under what conditions is a wastewater overflow acceptable. Stake holder engagement. Construction phases is likely typical design, tender, construct process.

Project Outputs – the things the project is going to deliver	
Output	**Output Quality Details**
ICM Model	A calibrated hydraulic model with survey to better validate asset data
Topographical Survey	Confidence in contour and obstructions along the preferred route
Contract Documents	Suitable to tender contract
Design Drawings	Suitable to tender contract
Legal Easements	To ensure Council has legal access for future maintenance
Trunk Sewer Construction	To Council Code of Practice standards

Key Risks – things that provide uncertainty in the project, focus on High risks if possible (see risk matrix in the appendix)			
Risk	**Likelihood**	**Impact**	**Score**
Private property access / structural damage	Almost certain 5	Major 4	Extreme
Legal challenges on trunk sewer through private property	Likely 4	Moderate 3	High

Project Resource Requirements				
Role	**Primary Responsibilities**	**Internal or External**	**FTE Estimate**	**Duration Estimate**
Sponsor	Ensure benefits realisation.	Internal	0.25	24
Asset Manager / Asset Engineer	Scoping, planning, handover to delivery team, tender reviews, council paper.	Internal	8	3
Programme Delivery Manager	Appoint project manager, consultation, tender reviews, reporting, handover.	External (or new internal role)	0	0
Project Manager	Project Management	External	8	24
Engineers Rep / Site supervision	Site supervision, quality, H&S, witness tests etc	External	15	24
Operations Team Staff / Network Engineer	Interface with operational plant, training commissioning, handover	Internal	8	24
Iwi liaison support	Assist with relationship, consents etc…	Internal	4	3
Procurement support	Procurement	Internal	8	1
Communications support	Communication	Internal	1	1

Cost Estimate Summary – for recommended option	
Item	**Estimated Cost**
STAGE 1	
P&G	1,179,418
Stage 1	5,897,090
Design Fees	707,651
MSQA	247,678

Project management	353,825
Contingency	1,677,132
TOTAL STAGE 1	**10,062,794**
STAGE 2	
P&G	895,516
Stage 1	4,477,580
Design Fees	537,310
MSQA	188,058
Project management	268,655
Contingency	1,273,424
TOTAL STAGE 2	**7,640,543**
TOTAL (S1 + S2)	**17,703,337**
TOTAL +25% (95%ile estimate)	**22,129,171**

How accurate are your estimates?
Cost certainty is medium (+/- 25%)
20% contingency allowed within quoted cost estimates.
Add 25% for a 95%ile cost estimate.

How will this proposal be funded?

New capex, part development contribution funded.

	Timescale/Cost – give a summary of how the project phases will be delivered.										
LTP 2021-2031	**Y0**	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	**Y10**
Phase (Initiate, Plan, Execute)	Initiate Plan	Plan Execute (diversions)	Execute								Stage 2
Cost of phase and year spent	750,000	800,000	9,000,000								$7,000,000

	Approval *If there's been a significant change in scope or change in cost/benefit*	
	Approvers Name	<insert name of person approving as well as hyperlink to their approval>
	Date	<Date of Approval>


Taupo WWTF
Existing Kara P/ P/S
Legend
Pipeline to be upgraded with second pipe
Existing Pipeline - No Upgrade Proposed
Option 1 - Gravity Interceptor Upgrade


N
Taupo WWTP
Legend
Proposed Rising Main
Kara Pl Additional Storage
Existing Pipeline - No Upgrade Proposed
Proposed Rising Main
Existing Kara Pl P/S
Kara Place Additional Storage
Option 2 - Partial Bypass Pumping


N
Taupo WWTP
Option 3B - Stage 2 - Gravity Main
Option 3B - Stage 2 - Rising main ALTERNATIVE ROUTE
Option 3B - Stage 2 - Rising main ROUTE OPTION
Future Storage
Tremaine Ave Future PS
Option 3B Stage 1 Pipeline
Existing Kara Pl PS
Legend
Tremain Ave Storage
Stage 1 Future_PS
Stage 1 Rising Main
Stage 2
Gravity Main
Rising main ALTERNATIVE ROUTE
Rising main ROUTE OPTION
Existing Pipeline - No Upgrade Proposed
Option 3 - Bypass Pumping & New Interceptor

LTP Business Case 1 to 3 years

Project Name	Taupō Wastewater Treatment Plant UV Disinfection Upgrade		
Description	Installation of disinfection for the treated effluent from the Taupo WWTP to enable ongoing compliance with new land disposal consent conditions.		
Business Owner	Michael Cordell	**BC Author**	Michael Cordell
Project Size	Medium	**Project Complexity**	Quest
Programme	N/A	**Location**	Taupō WWTP

Strategic Objectives *(see appendix below to help score Strategic Objectives)*			
		Score	**Project Score Total**
Primary	We have a legislative or regulatory responsibility to undertake this project, however not doing it will have a major impact and is likely to result in prosecution	4	9
Secondary	This project ensures we can continue to deliver services which are Critical for the town/District to Operate	5	
Background	The consent for the Taupō WWTP Rakaunui Road land disposal system is being renewed with new conditions that reduce the nitrogen loading limit onto the scheme. To reduce the buffer zones required and enable more of the land to be used, a disinfection maybe required.		
Business Need	Enables ongoing consent compliance for the Taupō WWTP discharge, thus enabling TDC to continue to provide sewage treatment services to Taupō township.		

Benefits and Wellbeings (see appendix)

Benefit	**How will you quantify and track**	**Benefit Type**	**Wellbeing**
Health	Meet resource consent conditions (draft 1000cfu/100ml)	Looking after Public Health and Safety	
Legislative Compliance	Annual monitoring reports for the disposal scheme will report on discharge compliance and compliance will be recorded each year	Environmental	

Opportunity	N/A		
Scope	**In**		**Out**
	• Design of WWTP UV upgrade • Installation of the UV systems and construction of any modifications required at the WWTP to accommodate the system • Filtration system (provisional)		• Additional upgrades to the Taupō wastewater management system not related to the UV system
Constraints	Must be completed before new consent conditions are in place in 2023.	**Assumptions**	We have assumed UV treatment is a viable option for disinfection. Filtration or another pre-treatment stage may be required. Filtration has been allowed in the project budget.
Dependencies	The method of disinfection has not yet been determined; initial UV testing has shown that UV disinfection might not be achievable at the WWTP. More investigation is required.		
Stakeholders	WWTP operators, Waikato Regional Council		

Change Mgmt.	Yes, unknown aspects of the project that are assessed and quantified during the project may cause a change in scope and budget for the project that must be managed		
Risk of Doing	Increased budget requirements	**Commentary**	
Risk of Not Doing	Wastewater disposal will not be compliant with the Rakaunui Road discharge consent following 2023	**Commentary**	

Options Analysis *(add more options if applicable)*			
	Option One: Change Nothing	**Option Two: Disinfection Upgrade (and associated View Road expansion)**	
Overview	No upgrades to the Taupō WWTP or land disposal scheme, this would mean that in 2023 the nitrogen loading onto the land disposal would be non-compliant with the consents	Installation of a UV system (or alternative) and required ancillary equipment (possibly a filtration plant) and modifications at Taupō WWTP, to enable the full irrigation area at Rapanui Road to continue to be used	
Advantages	• No capital cost	• Compliant wastewater discharge, and better treated effluent	
Disadvantages	• Non-compliant wastewater discharge, possible fines, environmental and reputational damage	• Capital investment required • Increased maintenance at WWTP required	
Costs	Unknown Expected fines due to non-compliance cannot be estimated	$ 5,200,000 Includes allowance for UV Plant Filtration Plant Alum dosing	
Achievability	N/A	Investigation as to preferred disinfection method to be confirmed.	
Recommendation	Option 2		

RECOMMENDED OPTION

Delivery Approach – How will this initiative be delivered?

Project Outputs – the things the project is going to deliver	
Output	**Output Quality Details**
Preliminary design	Equipment selection, design report and preliminary cost estimate
Detailed design	Detailed design report and drawings, engineers estimate, tender package
Construction	Completed UV system upgrade inc. operations manual and as-built drawings

Key Risks – things that provide uncertainty in the project, focus on High risks if possible (see risk matrix in the appendix)			
Risk	**Likelihood**	**Impact**	**Score**
Filtration plant may be required to meet proposed resource consent conditions related to UV disinfection.	Med	Med	12 (High)

Therefore, filtration has been allowed on the LTP. This might be able to be mitigated through a lessening of resource consent conditions currently being explored.			

Project Resource Requirements				
Role	**Primary Responsibilities**	**Internal or External**	**FTE Estimate**	**Duration Estimate**
Sponsor	Ensure benefits realisation.	Internal	0.25	18
Asset Manager / Asset Engineer	Scoping, planning, handover to delivery team, tender reviews, council paper.	Internal	8	3
Programme Delivery Manager	Appoint project manager, consultation, tender reviews, reporting, handover.	External (or new internal role)	0	0
Project Manager	Project Management	External	8	18
Engineers Rep / Site supervision	Site supervision, quality, H&S, witness tests etc	External	15	6
Operations Team Staff / Network Engineer	Interface with operational plant, training commissioning, handover	Internal	8	0
Iwi liaison support	Assist with relationship, consents etc…	Internal	4	0
Procurement support	Procurement	Internal	8	1
Communications support	Communication	Internal	1	1

Timescale/Cost – give a summary of how the project phases will be delivered.										
LTP 2021-2031	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	**Y10**
Phase (Initiate, Plan, Execute)	Execute	Execute								
Cost of phase and year spent	2,600,000	2,600,000								

Project Name	Taupo Eastern Trunk Sewer Upgrade Project		
Description	To increase capacity in the Eastern Trunk sewer to allow for growth.		
Business Owner	Mike Cordell	**BC Author**	CDM
Project Size	Lite (potentially Medium)	**Project Complexity**	"Paint by Numbers" – Know What & How
Programme	3-Years (minimum)	**Location**	Taupo Spa Road Trunk Sewer

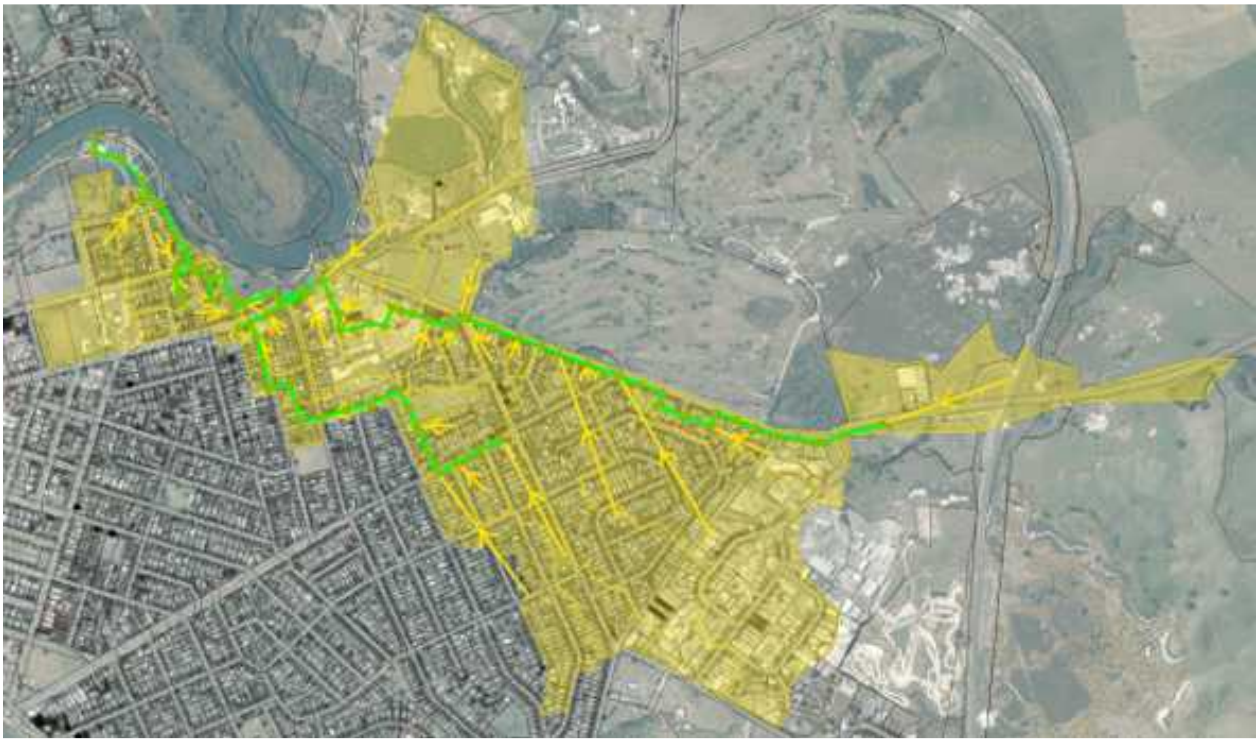

Figure 1 (above): Eastern Trunk Sewer Model Extent & Figure 2 (below): 2017/18 Flow Monitor Locations

Strategic Objectives *(see appendix below to help score Strategic Objectives)*		
	Score	**Project Score Total**

Primary	Public Health and Safety	4	9
Secondary	Maintaining Levels of Service	5	
Background	Taupo's Eastern Trunk Sewer has previously been identified and budgeted to allow an increased capacity to cater for high levels of Inflow & Infiltration (I&I). The latest flow survey completed in 2017/18 has demonstrated large reductions in inflows, however there remains the risk of uncontrolled sewer overflows during extreme rainfall events. Further multi-year trunk sewer rehabilitation is recommended in an attempt to avoid expensive trunk sewer upgrades.		
Business Need	Sewer overflows are not considered acceptable and the Eastern Trunk Sewer has the risk of wastewater overflow during significant rainfall events. The wastewater asset manager requires reliable sewer models to determine levels of risk in order to have good confidence in proposed upgrades. Minimal budgets have been available historically to improve Council's sewer modelling.		

Benefits and Wellbeings (see appendix)

Benefit	How will you quantify and track	Benefit Type	Wellbeing
Improved Public Health	Flow monitoring before and after rehabilitation will quantify I&I reductions to meet target level (5xADWF).	Improved Public Health	Social
Improve level of service	No uncontrolled sewer overflows.	Legislative Compliance	Social

Opportunity	To reduce wastewater inflows to avoid the risk of uncontrolled sewer overfows		
Scope	**In**	**Out**	
	• Investigation • Flow Survey • Smoke testing • Hydraulic modelling • Reporting	• Detailed Reporting	
Constraints	Funding	**Assumptions**	Funding will be made available
Dependencies	Funding		
Stakeholders	Public, Council, Tuwharetoa Trust Board, WRC		
Change Mgmt.	N/A		
Risk of Doing	Contractor H&S risks	**Commentary**	Will be managed as standard
Risk of Not Doing	Council could face litigation	**Commentary**	WRC may prosecute TDC if known risk is not managed. Note previous LTP project defined.

Options Analysis *(add more options if applicable)*

	Option One: Change Nothing	Option Two: I&I Reduction Rehab Programme	Option Three: Trunk Sewer Upgrade Project (IF REQUIRED)
Overview	Council will continue to have the risk of uncontrolled sewer overflows during heavy rainfall	It is proposed to undertake a rehabilitation programme in order to reduce inflow levels to an acceptable level with the aim of avoiding the need to upgrade the Eastern Trunk Sewer (as currently planned).	If the rehab is not successful, or growth exceeds expectations, and the trunk sewer needs upsizing, it is likely that a duplicate pipe would be necessary of approx. 300mm diameter to the WWTP
Advantages	Limits costs	Reduces risk of wet weather overflows	

Disadvantages	Public safety and risk of prosecution for sewer overflows	Not guaranteed but excellent chance of success and inflows should be removed regardless	Costly upgrades to trunk sewer that could be avoided with rehabilitation
Costs	Potential sewer overflow clean-up costs & risk of prosecution	Rehab Programme est $180,000	Trunk Sewer Upgrades est $1.14M
Achievability		Achievable subject to funding	Achievable subject to funding
Recommendation	Option 2 – reduce and assess reductions in I&I with intention to try and avoid Option 3 pipe upgrade requirements, which should be budgeted in case reductions are insufficient		

RECOMMENDED OPTION

Delivery Approach – How will this initiative be delivered?

- CDM Consultants has previously developed a high-level trunk sewer models using InfoWorks ICM software, and is well placed to update the models using new improved information, including survey, and model improvements as recommended.
- It is proposed that CDM Consultants Ltd works closely with WSP to obtain and optimise the improved data requirements, and jointly take responsibility to deliver a more robust trunk sewer model that meets Council needs.
- CDM can manage the flow survey and rehab works to quantify a suitable reduction in inflows to avoid the need to upgrade the trunk sewer (Option 3). Given the success in reductions to-date, it is considered to be very achievable but still prudent to budget for the pipe upgrades in case development exceeds the reduction benefits.

Project Outputs – the things the project is going to deliver

Output	Output Quality Details
Flow Survey	Good quality specialist sewer flow survey and rainfall data to validate model
Asset Data Survey	Manhole surveys to improve asset data, check surcharge levels and check for illegal connections
Trunk Sewer Model	The ICM trunk sewer model will be recalibrated and improved using the latest asset data
Rehabilitation	Stormwater inflow connections to be removed from the trunk sewer and benefits quantified

Key Risks – things that provide uncertainty in the project, focus on High risks if possible (see risk matrix in the appendix)

Risk	Likelihood	Impact	Score
There is a risk that the rehabilitation programme may not provide sufficient reductions in the trunk sewer to avoid trunk sewer upgrades	Unlikely	Major	Medium
There is a risk that development pressures may increase flows to a level that the trunk sewer upgrades are required regardless of rehab	Moderate	Major	High

Timescale/Cost – give a summary of how the project phases will be delivered.

LTP 2021-2031	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
Phase (Initiate, Plan, Execute)	I&I reduction	I&I reduction	I&I reduction	Initiate, Plan	Execute	Execute				
Cost of phase and year spent				150,000	1,110,000	540,000				

LTP Business Case 7 to 10 years

Project Name	Taupo WWTP – Overflow Risk Reduction		
Description	To increase the capacity of the Transfer Pump Station at the Taupo WWTP to reduce overflow risk to the Waikato River.		
Business Owner	Michael Cordell	**BC Author**	Michael Cordell
Project Size	Lite	**Project Complexity**	Movie
Programme	Related to the UV disinfection project	**Location**	Taupo WWTP

Strategic Objective *(see appendix below to select primary and secondary)*			
		Score	**Project Score Total**
Primary	Being Resilient and Prepared	5	9
Secondary	Looking after Public Health and Safety	4	

Background	In 2008 and again in 2011 the Taupo WWTP overflowed to the Waikato River during large storm events. In both instances the overflow occurred at the 'Transfer Pump Station' as it could not keep up with the incoming wastewater flows. There have been several improvements at the site since these overflows occurred however further improvements can be made. It is not possible to prevent overflows under all circumstances; there is always risk of an event the is larger than can reasonably be provided for. The 2011 event was significant, and overflow occurred. While there have been minor improvements made to the site to reduce the risk of overflow, should an event like 2011 occur again, an overflow would still occur, albeit at a reduced volume. The 2008 and 2011 storm events resulted in 1,730 m3 and 2,221 m3 of effluent being discharged to the Waikato River respectively, which accounted for 13% and 15% of the daily influent respectively (Mott MacDonald, 2015). These events show that at flows of up to 1,950 m^3/h, the critical hydraulically limited point in the system was the Transfer Pump Station and effluent storage pond capacity. The capacity of the Transfer Pump Station is currently 1,250 m^3/h.
Business Need	To reduce the risk of overflow to the Waikato River during extreme events.
Option/s	➢ Do nothing – overflow risk remains for large events; the 2011 event would result in overflow. ➢ Upgrade the Transfer Pump Station. Upgrading the Transfer Pump Station will reduce the risk of overflow under a repeat of the 2011 storm event. ➢ This project may need to be included in the UV filtration project. The scope of these projects is yet to be confirmed.
Benefits and Wellbeings	<u>Social</u> - Improved Public Health - Being legislatively compliant <u>Cultural</u> - Reduce risk of wastewater to water contamination - Legislative Compliance

Scope	**In**	**Out**	**Maybe**
	New or upgraded Transfer Pump Station	Increasing pond storage	Any other hydraulic bottlenecks Emergency Generator Upgrade

Potential Issues with preferred option	Overflow risk always remains even post upgrade. Scope uncertainty. Work in progress to determine what return event the system can currently meet and what an upgraded system will achieve.
Risk of Doing Nothing	If a repeat of the 2011 storm event was to occur again it would likely result in overflow to the Waikato River (but at a reduced volume). Although this was an extreme event (estimated at XX-year return period), that fact is has occurred in the recent past might mean that this event could be now seen as a foreseeable event. A repeat event might not be

Timescale/Cost – give a summary of how the project phases will be delivered.										
LTP 2021-2031	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	**Y10**
Phase (Initiate, Plan, Execute)	Plan			Execute						
Cost of phase and year spent	100,000			750,000						

Approval *This is the initial approval of the Business Case. It may be further prioritised against other projects*	
Approvers Name	<insert name of person approving as well as hyperlink to their approval>
Date	<Date of Approval>

Project Name	Turangi Wastewater – Land Disposal System		
Description	To develop a land-based wastewater disposal system for the Turangi community.		
Business Owner	Michael Cordell	**BC Author**	Michael Cordell
Project Size	Full	**Project Complexity**	Paint by Numbers
Programme		**Location**	Turangi South

Strategic Objectives *(see appendix below to help score Strategic Objectives)*			
		Score	**Project Score Total**
Primary	Being Legislatively Compliant	4	7
Secondary	Placemaking (Cultural)	3	
Background	The Ministry of Works and Development established the Turangi sewerage system and associated treatment plant on the current site in 1965. In the development of the WWTP and the Turangi township, the crown acquired significant portions of Ngati Turangitukua ancestral land without proper regard for the interests of Ngati Turangitukua. Little respect was paid to cultural values and wahi tapu were destroyed. Throughout the development of Turangi WWTP Ngati Turangitukua have maintained a position of opposition to the location and operation of the WWTP and the effects of the wastewater discharge on waterways. The Turangi WWTP delivers an essential service, treating wastewater from the townships of Turangi and Tokaanu to a high standard. The Turangi WWTP has been operating under a resource consent that allowed for the discharge of treated wastewater to the former Hangarito Stream Channel and Te Matapuna o Taupo Moana wetland. This consent expired on June 2018. On 11 December 2017, TDC lodged applications with the Waikato Regional Council (WRC) to renew the expiring discharge consents. In doing so, TDC secured s.124 rights under the Resource Management Act 1991 to continue to operate under the expiring consents while a replacement consent is being sought. Following lodgement for this resource consent application WRC received letters of opposition from the Tūwharetoa Maori Trust Board (TMTB), Ngāti Turangitukua and Ngati Kurauia. Processing of the Turangi WWTP application by WRC has been deferred pending the outcomes of further consultation. Ngati Kurauia, Ngāti Turangitukua, TMTB and TDC representatives have subsequently agreed to work together to consider alternative options for the discharge of treated wastewater from the Turangi WWTP.		
Business Need	To secure a long-term sustainable wastewater disposal process for the Turangi community of approximately 2,300 households and businesses.		

Benefits and Wellbeings (see appendix)

Benefit	**How will you quantify and track**	**Benefit Type**	**Wellbeing**
Culturally appropriate method of wastewater disposal	By gaining a new resource consent and avoiding a contested hearing / environment court process.	Legislative compliance + culturally acceptable solution	Cultural
Enhancement of flora and fauna	The land likely to be utilized for the land disposal project is currently farm/forestry land and conversion of that land to newly planted native trees will have a benefit indigenous flora, fauna.	Biodiversity	Environmental
Long-term certainty of wastewater disposal solution	By gaining a new resource consent with a long time period (30 years).	Cost avoidance / Risk avoidance	Economic

Opportunity	By addressing the business need to have a long-term wastewater disposal solution, we will go some way to resolve the long-standing cultural issues surrounding the current discharge practices to the wetland and ultimately Lake Taupō. We will also have certainty that a long-term consent provides and this will allow TDC to make investment decisions with greater confidence.		
Scope	**In**	**Out**	
	• Resource consent application • Design and construction of: Pump station and rising main to new disposal area Storage at new irrigation site • Irrigation infrastructure • Planting	• Relocation of the WWTP • Rehabilitation of existing site	
Constraints	Depending on project timing, resources would be a constraint. External project management is recommended. Given the high cost of this project, funding may be a constraint as the project will likely be rates funded.	**Assumptions**	Landowner approval (irrigation site) is given. That a resource consent will be granted.
Dependencies	Agreeing the preferred solution with stakeholders, gaining of Resource consent with WRC, landowner agreements.		
Stakeholders	Ngati Turangitukua, Ngati Kurauia, Tūwharetoa Maori Trust Board, Landowners, Waikato Regional Council, Turangi residents, ratepayers and potentially Tongariro River users.		
Change Mgmt.	Yes, change management is required.		
Risk of Doing	Community pushback on the cost of the project. Increase risk of future spills due to an increase in critical pipelines.	**Commentary**	
Risk of Not Doing	Deteriorating relationship with Iwi Consent risk with re-consenting the alternative option i.e. no support from Iwi regarding status quo.	**Commentary**	

	Option One: Minor improvements to current discharge site	**Option Two: Move to land-based disposal system**
Overview	The '***do nothing'*** option means Council would aim to continue to discharge at the current location. Some improvement will be required to mitigate localised environmental effects and this work will likely be related to improving the disruption on the effluent discharge i.e. multiple discharge points.	Disposal of wastewater by irrigation to land; and most likely to newly planted native trees.
Advantages	• Lower capital and operation costs • Consent application is already lodged therefore no need to relodge the application.	• Culturally acceptable method of wastewater disposal (to land). • Likely to be an easier consenting process due to support from Iwi (assumed).

Disadvantages	• Discharge to water (wetland/Lake Taupō) remains and this is not acceptable to Iwi. • Consent application will be opposed and likely challenged to hearing or Environment Court • Costs of consenting process including hearing or court costs • Relationship with Iwi will be damaged • If the consenting process is successful, the consent granted is likely to be short-term consent (say 15 years). • Uncertain consent outcome including the extent of improvements that might be required.	• Higher capital and operational cost • Council does not own land for this land disposal process (however a long-term lease could mitigate this concern).
Costs	Capex estimate $ 1,000,000. Opex costs are likely very low and not significantly different that the current system. No detailed cost estimates calculated. There is significant uncertainty on the outcome of the consent process and what may be required. However, assuming a consent is granted, the cost will likely be significantly lower than Option 2.	Capex $ 16,000,000 Opex $ 170,000 p.a. There is still a reasonably high cost uncertainly that will be refined as the preferred option is developed further. Also note that any income derived from the operation of the land disposal site, potential crop sale, is not included at this stage.
Achievability	Consenting risk.	The preferred site has been identified but not yet confirmed Consent risk remains however there will likely be less objection to this consent application Landowner approvals.
Recommendation	Note that this project is going through a special decision-making process whereby Council will receive recommendation from a TDC/Iwi joint working group. The remainder of this BC assumes Option 2 is selected however this can be updated following Council decision. However, at this stage there is no agreement on the land and therefore it maybe difficult to include the project in the LTP without any ability to deliver it.	

RECOMMENDED OPTION

Delivery Approach – How will this initiative be delivered?
Typical consent, design, construct infrastructure project. Design build options possible for irrigation works (procurement process to be determined). Roles, internal/external detailed below.

Project Outputs – the things the project is going to deliver	
Output	**Output Quality Details**
Resource Consent	Recourse consent for discharge of wastewater to land
Pump station, rising main, storage, irrigation system	Infrastructure to deliver new wastewater disposal method for Turangi
Hand over documentation	Asbuilt records, O&M manuals

Key Risks – things that provide uncertainty in the project, focus on High risks if possible (see risk matrix in the appendix)			
Risk	**Likelihood**	**Impact**	**Score**
Consent risk – the project cannot proceed without a recourse consent however the risks of not getting resource consent are low.	Unlikely (2)	Major (4)	8
Land access (landowner agreement needed prior to commencement)	Unlikely (2)	Major (4)	5

Cost Estimate Summary – for recommended option	
Item	**Estimated Cost**
CAPEX	
Storage, pump station, rising main, receiving pond.	$ 14,500,000
Irrigation pump station + irrigation assest	$ 1,500,000
Total Capex	**$16,000,000**
OPEX	
Power	$ 50,000
Infrastructure O&M	$ 110,000
Land lease	$ 10,000
Total Opex	**$ 170,000** **(maybe partially offset by any income generated – if any)**
How accurate are your estimates? +/- 30%	
How will this proposal be funded? New Capex	

Timescale/Cost – give a summary of how the project phases will be delivered.										
LTP 2021-2031	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	**Y10**
Phase (Initiate, Plan, Execute)							Initiate (Consenting)	Plan (Design)	Execute (Construction)	Execute (Construction)
Cost of phase and year spent							250,000	750,000	7,500,000	7,500,000

Project Name	**Waihi Village water and wastewater schemes**		
Description	Provision of water and wastewater services to the Waihi Village community.		
Business Owner	Tom Swindells	**BC Author**	James Aremu
Project Size	Lite	**Project Complexity**	Paint by Numbers
Programme	No	**Location**	Waihi Village

Strategic Objectives *(see appendix below to help score Strategic Objectives)*			
		Score	**Project Score Total**
Primary	Looking after public health and safety	2	4
Secondary	Protecting our Environment	2	
Background	The Waihi Village community is a small community of about 75 people and is made up of 35 properties including a Marae. It is located on the shore of Lake Taupo about 2.5 km northwest of Tokaanu. The existing water supply was installed by local residents some years ago and has not changed much since. The system has grown as more residents have been connected and small changes have been made to the system over the years. The reliability and water quality are poor. The extent of this network is confined to supplying the existing houses, Marae and hall (North of Convent Road). The existing supply is untreated and does not meet the current Drinking Water Standards for New Zealand 2005 (DWSNZ, Revised 2018). The supply is also vulnerable to microbiological contaminants from animals and birds and failure during wet weather due to damage to or blocking of the intake which also has poor access for maintenance. At present, all lots (residences and Marae) are serviced for wastewater by on-site sewage disposal (i.e. septic tanks). Based on experience with communities established before the 1970's, it is likely that the tanks are smaller in size/volume than what current standards would require. No sewer reticulation exists in the immediate area to service the Waihi Village community. This project includes the connection of the Waihi Village to the Turangi/Tokaanu water and wastewater schemes via construction of new pipelines and pumping stations. This business case has been driven by a submission to Taupo District Council (TDC) from Waihi Kahakaharoa 1Z2B2B Maori Reservation Trust also known as Waihi Marae requesting funding to upgrade the existing Water Supply scheme and onsite septic tanks at Waihi Village. This Submission was made on behalf of the residents of Waihi Village, the Waihi Marae, Ngāti Turumakina & Te Mahau hapu of Waihi Village. Waihi Marae engaged WSP (when Opus) for the assessment of the existing water & wastewater infrastructure (not owned or operated by TDC), high level options assessment and cost estimates. This work is reported in the following documents and form the basis for this business case; • Waihi Village Water Supply Preliminary Design Report dated February 2014 • Waihi Community Drinking Water Supply – Water Safety Plan • Waihi Village Wastewater upgrade Waihi Marae approached several other organisations to help fund this project but have had little success other than the Ministry of Health (MoH) who have committed to funding a portion of the water Supply scheme. The primary driver for this business case is Looking after Public Health and Safety. This includes improving the drinking-water quality of those in Waihi and improving the lake and ground water quality by removing septic tanks. Similarly, the secondary driver is protecting our environment as the project will removed potentially leaky septic tanks from the area.		

Business Need	• Achieving DWSNZ 2005 (Revised 2018) compliance. • Improving resilience of water supply and wastewater disposal systems.

Benefits and Wellbeings (see appendix)

Benefit	How will you quantify and track	Benefit Type	Wellbeing
Revenue gathering through water metering or targeted rates.	New connection number and increase in rating	Revenue Growth	Economic
Reduce likelihood of wastewater leaching into the Lake Taupo.	Lake monitoring before and after the projectcould be completed.	Protecting our Waterways	Environmental
Improved public health and safety due to improved treated water quality	Number of new connections to the scheme	Legislative Compliance, Public Safety	Social
Create a good working relationship with the local community and Iwi.	Improved iwi relationships	Improving community interaction	Cultural

Opportunity	Provision of water and wastewater services to the Waihi Village community.		
Scope	**In**	**Out**	
	Water Supply Scheme; • New connection works at existing Turangi/Tokaanu water supply network. • New gravity feed pipe from above connection to Waihi Village network. • New reticulation network at Waihi Village including connection to occupied lots. Wastewater Disposal Scheme; • Collection system at Waihi Village • Pumping station • Rising Main from Waihi Village to Tokaanu Common • Land acquisition wastewater pump station(s) • Easements on private land for proposed water supply and wastewater schemes.	• Connection of Braxmere Lodge/Lakehouse Restaurant to the wastewater disposal system.	
Constraints	• Resourcing and Procurement. • Funding and approval. • Pipe trench crossing a well-known land slip path. • Construction challenges due to high water table.	**Assumptions**	The proposed water and wastewater infrastructure will be vested with the council and subsequently owned, operated and maintained by TDC.
Dependencies	• Resource consent requirements as may be required for construction of the reticulation networks, and pump station. • Land acquisition and or establishment of easements on Maori/Iwi land.		
Stakeholders	Senior management, Councillors, Residents of Waihi Village and Waihi Marae, Ngāti Turumakina and Te Mahau hapu of Waihi Village and Project Team (TDC staff and Consultants).		
Change Mgmt.	No		
Risk of Doing	Community unrest regarding costs of project. Future land slip may result in loss of service to community.	**Commentary**	
Risk of Not Doing	Safe water not provided to Waihi village	**Commentary**	

	Leaching of wastewater into Lake Taupo.		

Options Analysis *(add more options if applicable)*		
	Option One: Change Nothing	**Option Two – Complete Project**
Overview	Waihi Village remains self-sufficient.	Connection of Waihi Village to the Turangi/Tokaanu water and wastewater schemes via construction of new pipelines and pumping stations.
Advantages	• No cost to TDC.	• Improved iwi relationships • Improved water supply to the Waihi community • Significantly improved and reliable wastewater disposal. • Reduced health risks as the likelihood of sewage leaching will be reduced.
Disadvantages	• Water safety risks for Waihi community. • Potential for Sewage to leach into the Lake from aging nearby septic tanks.	• Significant capital cost to TDC. • Total finding commitment for TDC will be approximately $1.95M.
Costs	• No cost to Council	•
Achievability	• Achievable	• Achievable
Recommendation	Council approved the project in principle at the last LTP. Therefore, it is recommended this project proceeds in year 1.	

RECOMMENDED OPTION

Delivery Approach – How will this initiative be delivered?
• Initial investigation, consultation, design and tendering • Standard construction contract delivery • Considerable amounts of stakeholder engagement likely to be needed.

Project Outputs – the things the project is going to deliver	
Output	**Output Quality Details**
As per scope	

Key Risks – things that provide uncertainty in the project, focus on High risks if possible (see risk matrix in the appendix)			
Risk	**Likelihood**	**Impact**	**Score**
Landslip	Rare	Catastrophic	Medium
Inability to agree easements	Unlikely	High	Medium
Private plumbing failures	Likely	Minor	Medium
Project cost increases	Likely	Minor	Medium

Project Resource Requirements				
Role	**Primary Responsibilities**	**Internal or External**	**FTE Estimate**	**Duration (months)**
Sponsor	Ensure benefits realisation.	Internal	0.01	12
Asset Manager	Scoping, planning, handover to delivery team, tendr reviews, council paper.	Internal	0.05	12
Programme Delivery Manager	Appoint project manager, consultation, tender reviews, reporting, handover.	External	0.1	12
Project Manager	Project Management	External	0.50	12
Engineers Rep / Site supervision	Site supervision, quality, H&S, witness tests etc	External	0.50	6

Stakeholder Engagement	Interface with operational plant, training commissioning, handover	Internal	0.25	12
Network Engineer	Interface with network, design reviews, training commissioning, handover	Internal	0.25	3
Communications Staff	Comms plan and support	Internal	0.03	12

Cost Estimate Summary – for recommended option		
Item	**Estimated Cost**	**Capital or Operational**
Planning	$123,335	Capital
Design	$175,423	Capital
Construction	$1,666,516	Capital
Construction Monitoring	$123,335	Capital
Contingency	$333,303	Capital
Operational expenditure	$16,000/annum	Operational
Total Estimated Capital Cost	$2,2421,913	Water & Wastewater
Total Estimated Operational Cost/year	$16k/annum	Water & Wastewater
Water Project Cost	$1,219,812	
Ministry of Health (MoH) funding	-$471,420	
Water Project Cost – Council Funded	$748,392	
Wastewater Project Cost	$1,202,101	
How accurate are your estimates? Costs fairly accurate (+/-20%)		
How will this proposal be funded? New Capex project		

Timescale/Cost – give a summary of how the project phases will be delivered.										
LTP 2021-2031	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	**Y10**
Phase (Initiate, Plan, Execute)	Plan, Execute									
Water	1,219,812									
Wastewater	1,202,101									

Approval *If there's been a significant change in scope or change in cost/benefit*			
Review – Tom Swindells		Date	*29/01/2021*
Approval – Denis Lewis			

LTP Business Case 7 to 10 years

Project Name	Whareroa Wastewater Irrigation Expansion		
Description	Expansion of Whareroa irrigation land to meet the nitrogen consent condition.		
Business Owner	Michael Cordell	**BC Author**	Michael Cordell
Project Size	Lite	**Project Complexity**	Paint by Numbers
Programme	Wastewater Irrigation Expansion Programme	**Location**	Whareroa WWTP and Land Disposal Area

Strategic Objective *(see appendix below to select primary and secondary)*			
		Score	**Project Score Total**
Primary	Protecting the environment	5	9
Secondary	Looking after public Health and Safety	4	

Background	The existing treatment and disposal system consist of two oxidation ponds and surface spray irrigation of the effluent on to land. The oxidation ponds were originally constructed circa 1997. Both ponds were rehabilitated in 2006/2007 due to subterranean tomo formation under the ponds. At this time an inlet screen was installed as well as influent flow measurement. Both ponds were internally lined with an impermeable HDPE liner. Supplemental mechanical aeration was installed in pond 1 in 2009. The treated pond effluent is spray irrigated to 1.3 Ha of pastureland with a cut and carry cropping rotation. Current connection to the WWTP ~155 lots Expansion should be built at ~180 Lots (capacity is approximately 25 lots; growth rates is very slow therefore project timing is uncertain). Allow for future stage 3 expansion if Whareroa North subdivision proceeds Stage 1 – 1.3 Ha (existing irrigation) Stage 2 – 1.3 Ha + 1.2 Ha (new irrigation areas to accommodate growth)
Business Need	To expand the existing irrigation land to meet the nitrogen consent conditions
Option/s	• Expand the irrigation land – Preferred option • Installed a Nitrogen removal plant
Benefits and Wellbeings	• Improving public health and safety – Social • Protecting the environment – Environmental • Improve level of service – Social

Scope	**In**	**Out**	**Maybe**
	• Planning & feasibility works for the new irrigation site • Electrical, control and automation upgrades associated with the new irrigation site. • Upgrade of treatment plant	• Land acquisition not required • Fencing of the new irrigation land.	• Construction of a third pond to act as irrigation buffer storage

Potential Issues with preferred option	• Project funding may be an issue as the project will be rate funded. • Depending on project timing, resources could be an issue
Risk of Doing Nothing	• Impact on public health and safety. • Environmental damage with long lasting effect. • Inability to meet nitrogen consent condition.

Timescale/Cost – give a summary of how the project phases will be delivered.										
LTP 2021-2031	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	**Y10**
Phase (Initiate, Plan, Execute)								Initiate, Plan, Execute		
Cost of phase and year spent								230,000		

APPENDIX

Project Complexity

Benefits and Wellbeings

Social	Economic	Environmental	Cultural
Improved Public Safety	Cost Reduction	Legislative Compliance	Legislative Compliance
Improved Public Health	Revenue Growth	Reduction in Water Usage	Treaty Settlement Acknowledgement
Legislative Compliance	Revenue Protection	Waste Reduction	Improved Cultural Understanding
Customer Satisfaction	Cost Avoidance	Emissions Reduction	Improve Community Engagement
Empowering People	Process Efficiency	Protecting our Waterways	
Improving Relationships	Brand Awareness	Reduced Emission/Carbon Zero Initiative	
Improve Community Interaction	Legislative Compliance	Improve or Promoting District Sustainability	
Increasing Educational Opportunities	Improve Process Efficiency	Reduced Congestion	
Improve Level of Service	Improve Community affordability		
Increase Community Offerings	Enabling Sustainable Growth		
Improve Community Engagement			
Improve Community Affordability			
Increased Accessibility			
Improved Resilience and Preparedness			
Reduced Congestion			

Strategic Objectives Scoring

Looking after Public Health and Safety

Score	Criteria	Example Project/s
1	Failure to do this project could have a minor impact on the public's health and safety and affect a small number of people	Surface repairs on the velodrome track
2	Failure to do this project could have a moderate impact on the public's health and safety and affect a small number of people	
3	Failure to do this project could have a moderate impact on the public's health and safety and affect a large number of people	
4	Failure to do this project could have a severe impact on the public's health and safety and affect a small number of people	
5	Failure to do this project could have a severe impact on the public's health and safety and affect a large number of people	Water treatment plant upgrade in one of our three main centres

Maintaining Levels of Service

Score	Criteria	Example Project/s
1	This project ensures we can continue to deliver services which are used by a small group of people	Reseal of a club car park, or neighbourhood playground renewal
2	This project ensures we can continue to deliver services which are used by a suburb or neighbourhood	
3	This project ensures we can continue to deliver services which are used by the town or a community	
4	This project ensures we can continue to deliver services which are used by the District	Online LIMS or other online services
5	This project ensures we can continue to deliver services which are Critical for the town/District to Operate	Taupo Water Treatment Plant membrane filtration upgrade

Being Resilient and Prepared

Score	Criteria	Example Project/s
1	Doing this project enables us to respond quickly to a loss of services for a few people	Development of a business continuity plan for a small community or group of people
2	Doing this project reduces the chances of losing services which effects a few people	
3	Doing this project enables us to respond quickly to a loss of services for a small group of people	
4	Doing this project reduces the chances of losing services which affect a small group of people	
5	Doing this project reduces the chances of losing services which are critical for the town/district to operate	Capacity Upgrade of Town Water Treatment Plant, Larger community reservoir construction and burst control valves. Certain Online Services

Being Legislatively Compliant

Score	Criteria	Example Project/s
1	Doing this is best practice	Stormwater improvement devices - downstream defender
2	We have a legislative or regulatory responsibility to undertake this project, however not doing it will have minor impact and is unlikely to result in prosecution	
3	We have a legislative or regulatory responsibility to undertake this project, however not doing it will have a moderate impact and may result in prosecution	Fixing Data related to 3 Waters consent conditions
4	We have a legislative or regulatory responsibility to undertake this project, however not doing it will have a major impact and is likely to result in prosecution	Upgrading water schemes to be compliant with NZDWS
5	Doing this **now** is absolutely mandatory and prosecution is certain	LTP, Annual Plan

Internal Innovation

Score	Criteria	Example Project/s
1	This project leads to minor internal operational efficiencies (such as time and cost savings) through innovative ways of doing things or contributes to an improved employee experience for some employees	Rostering software for a team
2	This project leads to moderate internal operational efficiencies through innovative ways of doing things	Implementation of Smart Trak or Priava booking software
3	This project leads to moderate internal operational efficiencies through innovative ways of doing things that improve our external customer experience	Implementation of online booking forms for Customers
4	This project leads to significant internal operational efficiencies through innovative ways of doing things or contributes to an improved employee experience for all employees	RFID implementation at the library
5	This project leads to significant internal operational efficiencies through innovative ways of doing things that improve our external customer experience	Implementation of Online Property Files and LIMS

Protecting our Environment

Score	Criteria	Example Project/s
1	This project increases our reputation as an environmentally responsible organisation	Enviropods or Roof water recycling tanks for any new buildings
2	This project promotes environmental sustainability or provides a mitigation or adaption to climate change	
3	This project will ensure we are compliant with environmental conditions and/or new environmental standards	Stormwater improvement devices - downstream defender
4	Failure to do this project may lead to prosecution or negative publicity due to environmental damage which will damage our reputation	
5	Failure to do this project will lead to major environmental damage with long lasting effects	Wastewater rising-main (pressure pipe) renewals beside the lake. Those that have failed so now need to be renewed

Economic Development

Score	Criteria	Example Project/s
1	This project will contribute to economic development however the scale is unknown or has not been quantified	Mangakino Sports Changing Facilities
2	This project will contribute to minor economic development or enable another minor economic development project to realise its benefits	
3	This project will contribute to moderate economic development or enable another moderate economic development project to realise its benefits	
4	This project will contribute to significant economic development or enable another significant economic development project to realise its benefits	Great Lake Walkway
5	This project will contribute to ongoing major economic development such as the creation of new jobs, town spend to a value >$1m/year	Ironman, Cycle Challenge

Placemaking

Score	Criteria	Example Project/s
1	Doing this project will enhance the attractiveness of an existing area	Neighbourhood playground renewal
2	Doing this project will provide a positive outcome that enhances the vibrancy and connectedness of the town or community	CBD/Intersection Upgrades
3	Doing this project will provide a positive outcome that enhances the vibrancy and connectedness of a District	
4	Doing this project will create a positive nationwide reputation and leave a lasting legacy for our people	
5	Doing this project will create a positive worldwide reputation and leave a lasting legacy for our people	Otumuheke Hot Pools

Risk Matrix

Likelihood	Consequences				
	Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
Almost Certain 5	Medium	Medium	High	Extreme	Extreme
Likely 4	Low	Medium	High	High	Extreme
Moderate 3	Low	Medium	Medium	High	High
Unlikely 2	Insignificant	Low	Medium	Medium	Medium
Rare 1	Insignificant	Insignificant	Low	Low	Medium

LTP Business Case 1 to 3 years

Project Name	**Wastewater Network Maintenance Improvements**		
Description	To reduce the risk of sewer blockages, overflows, and effluent leakage to land, lake and rivers and to assess the condition of assets to feed into good renewals planning and minimise failing and at-risk sewer infrastructure.		
Business Owner	Kevin Sears	**BC Author**	Graeme Jackson
Project Size	Lite	**Project Complexity**	Paint by numbers
Programme	Improve service delivery and reduce risk.	**Location**	Various around Taupo District

Strategic Objectives *(see appendix below to help score Strategic Objectives)*			
		Score	**Project Score Total**
Primary	**Being Resilient and Prepared** – By carrying out good network maintenance it reduces the likelihood and risk of sewer overflows and leakage which can have a detrimental effect for the town/district to achieve its goal of being the most liveable district.	4	7
Secondary	**Looking After Public Health and Safety** – Failure to do these projects could have a severe impact on the public's health and safety and affect a large number of people.	3	
Background	Due to funding constraints leading to reduced maintenance and condition inspection's over many years, the state of many of the sewer pipes, manholes, and septic tanks, in the district have fallen in too poor condition elevating the risk of sewer overflows and effluent leakage to land, waterways and the lake. Over the past few years TDC Network engineers have been working to identify as many of these risks as possible and to address each in a logical priority order. Some have been identified which needed immediate attention as they were at the point of collapse and others a more scheduled approach is being used. This funding is being sort to address the following known risks. 1. **Sewer Manhole Raise and Repair.** As the SL-Rat program advances more and more into areas that have not been inspected before it is identifying many buried and damaged manholes that need to be raised the surface and or repaired. Many sewer overflows are caused by blockages in manholes and this work will reduce this risk. 2. **Bridge and Gully Crossings.** A risk assessment needs to be carried out to look at sewer mains which cross these areas due to the potential of failure from erosion, ground movement, and third-party damage. Many of the pipes and manholes are inaccessible and their condition is unknown. The risk assessment would allow for planned renewals and or redirection to reduce the risk of failure. 3. **Targeted CCTV Condition Assessment.** From knowledge gained from work done so far it has identified high levels of corrosion in first receiver gravity sewer lines and manholes from sewer pump stations, and main feeder lines that feed into the sewer trunk mains. These areas are prone to corrosion due to high levels of hydrogen sulphide being released. Due to this there is an elevated risk of failure as previously seen with the Southern trunk main urgent renewal. Carrying out this condition assessment work will identify renewals work that needs to be done ahead of time and before another near miss or event occurs. It will also help with good renewals planning for future LTP process. 4. **Septic Tank Condition Assessment Survey.** Council owns and services over 400 septic tanks in the district, many of which are at or below lake level. Knowledge gained from servicing these septic tanks has shown that some are in poor condition and are potentially leaking. A survey needs to be carried out to identify the issues and provide a strategy for how we could address what is found.		
Business Need	Good condition and risk assessments need to be done to allow for good asset renewals planning to lower the risk of sewer overflows, effluent leakage and asset failures. Being able to access manhole lids quickly and easily is essential for maintaining the network and responding to issues. It is vital that manholes are at ground level and not buried. The number of buried manholes in the district is significant and this makes responding to overflows very difficult and slows the response down. It is		

	essential that TDC raises these manholes to the surface and the culture of accepting manholes get buried changes.

Benefits and Wellbeings (see appendix)

Benefit	How will you quantify and track	Benefit Type	Wellbeing
Sewer Manhole Raise & Repair: Speed up the response to overflows by ensuring manholes are at ground level and not built over. Reduce the number of sewer overflows caused by broken haunching's in sewer manholes.	Identify all bridges and crossing numbers and record all assets in Assetfinda with condition rating. Checking the location and number of manholes being raised/repaired plus the reduction in the number of sewer overflows to the environment.	Improved Resilience and Preparedness.	Environmental Cultural, Economic.
Bridge and Gully Crossings: To reduce to the potential of failure from erosion, ground movement, and third-party damage.	Identify all bridges and crossing numbers and record all assets in Assetfinda with condition rating. Access and assess TDC assets and gain asset data to empower good decision making for renewal/relocation and or maintenance requirements. Reduce the risk of critical asset failure.	Improved Resilience and Preparedness.	Environmental Cultural, Economic.
Targeted CCTV Condition Assessment: Identify and reduce the risk of failure of critical sewer lines that can affect many people.	Identify all bridges and crossing numbers and record all assets in Assetfinda with condition rating. Reduce risk of critical asset failure and sewer overflow to the environment. Gain asset data empowering a strategy for good renewal decision making.	Improved Resilience and Preparedness.	Environmental Cultural, Economic.
Septic Tank Condition Assessment Survey: Identify effluent leakage issues and provide a strategy for how to address what is found.	Identify all bridges and crossing numbers and record all assets in Assetfinda with condition rating. Gain the knowledge to determine to best course of action for each area and or property identified.	Improved Resilience and Preparedness.	Environmental Cultural, Economic.

Opportunity			
Scope	**In**	**Out**	
	• Risk Assessments. • Condition Assessments • Clean & Repair • Procurement of specialised contractors to carry out the work. •	• Renewal/replacement	
Constraints	None	**Assumptions**	Availability of specialised contractors
Dependencies	None		
Stakeholders	**Internal** ▪ Internal Water and wastewater staff. ▪ TDC Management and 3 Water Operations ▪ Civil Defence **External** ▪ Landowners ▪ Waikato Regional Council ▪ Te Toi Ora Lakes District Health Board ▪ Downer ▪ Local Iwi ▪ General Public		
Change Mgmt.	Communication plan to staff and contractors delivered via weekly team meetings.		

	Monthly progress updates to SLT.		
Risk of Doing	Likely to identify some assets that are in very poor condition and should be replaced immediately, limited renewals budgets available.	**Commentary**	Priorities of renewal work may need to be rethought as condition assessments are done.
Risk of Not Doing	Impending failure of some assets causing sewer overflows with potential to enter water ways. Risk of fines and prosecutions from WRC.	**Commentary**	Ignorance is no longer an acceptable excuse.

Options Analysis *(add more options if applicable)*			
	Option One: Change Nothing	**Option Two**	**Option Three**
Overview	We have not been doing much condition assessment of the network, but what we have done has given some alarming results and to continue to do little would not address the impending failures that are on the horizon.	Carry out all the proposed work in the first three years of the LTP	Carry out the proposed work over the first 4 to 5 years of the LTP
Advantages	• No additional cost	• Reduce risk of overflows / blockages • Good renewals planning • Reduce risk of bridge & gully crossing asset failure.	• Reduce cost per year. • Some information gathered to help with renewals planning..
Disadvantages	• Poor renewals planning • High risk of overflows/blockages • Medium to high risk of major failures of bridge & Gully crossings assets.	• Additional cost.	• Overall cost probably high as increased set up cost. • Risk of overflows extended over a longer period. • Higher risk of asset failures due to some assets not being assessed for 4 to 5 years
Costs	Nil additional	$590,000 over 3 years	Estimated $650,000 over 5 years
Achievability		Achievable if contractors are available.	Achievable if contractors are available.
Recommendation	Option Two		

RECOMMENDED OPTION

Delivery Approach – How will this initiative be delivered?
• Via the Three Waters Maintenance Contract and other contractor/consultants.

Project Outputs – the things the project is going to deliver	
Output	**Output Quality Details**
Good Condition Assessment	Better renewals planning.
Good Risk Assessment	Better understanding of the risks and better risk mitigation.
Reduced Sewer Overflows	Contribute to Councils goal of being the most liveable district.

Key Risks – things that provide uncertainty in the project, focus on High risks if possible (see risk matrix in the appendix)			
Risk	**Likelihood**	**Impact**	**Score**

Availability of suitable contractor/consultants	2	3	Medium

Project Resource Requirements				
Role	**Primary Responsibilities**	**Internal or External**	**FTE Estimate**	**Duration Estimate**
Network Engineer	Procure consultants/contractors, Audit work, record findings in Assetfinda	Internal	0.2	3 yrs

Cost Estimate Summary – for recommended option		
Item	**Estimated Cost**	**Capital or Operational**
Manhole raising and repairs	$100,000 split between yr 1 & 2 LTP	Opex
Bridge & gully crossing assessment	$40,000 yr 1 LTP	Opex
Targeted CCTV condition assessments	$350,000 split over 3 years	Opex
Septic tank condition survey	$100,000 Yr 1 LTP	Opex
Total Estimated cost	$590,000	
How accurate are your estimates? Engineers estimate, should be reasonably close.		
How will this proposal be funded? Opex budgets in LTP		

LTP 2021-2026	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**
Phase (Initiate, Plan, Execute)	$290,000	$200,000	$100,000		
Cost of phase and year spent					

LTP 2027-2031	**Y6**	**Y7**	**Y8**	**Y9**	**Y10**
Phase (Initiate, Plan, Execute)					
Cost of phase and year spent					

LTP Business Case 1 to 3 years

roject Name	**Wastewater Treatment Civil/Structural Renewals**		
Description	To successfully carry out the planned renewals of all TDC's Wastewater Treatment Plant's Civil Structures		
Business Owner	Kevin Sears	**BC Author**	**Shannon McMillan**
Project Size	Lite	**Project Complexity**	Paint by numbers
Programme	Improve service delivery and reduce risk.	**Location**	Various around Taupo District

Strategic Objectives *(see appendix below to help score Strategic Objectives)*			
		Score	**Project Score Total**
Primary	**Maintaining levels of service** - This project ensures we can continue to deliver services which are Critical for the town/District to Operate	5	10
Secondary	**Being Resilient and Prepared** - Failure to do this project could have a severe impact on the public's health and safety and affect a large number of people	5	

Background

The Wastewater Civil/Structural assets are part of the wider Water/Wastewater Treatment Renewals program. The purpose of the Renewals Program is to prevent or minimise the risk of assets reaching complete failure by renewing an asset to near new condition or, in some cases, by installing a full replacement.

The renewal schedule is generated by completing condition assessments, tracking this captured data in the asset renewals schedule Objective spreadsheet A1728463 WWTP Planned Renewals and the condition of assets tracked in Objective spreadsheet A304131 Wastewater Treatment Asset Condition and Renewals Plan. As assets are condition assessed, they are re-evaluated and the asset's renewal date adjusted if required. In some cases, assets can be renewed sooner than originally scheduled if the condition has deteriorated sooner than expected or if the benefits outweigh the cost (such as technological advancements, improved efficiencies).

The key elements of the renewals program are:

- Taking a lifecycle approach to managing assets
- Developing cost effective management strategies for the long-term
- Monitoring asset performance
- Understanding and meeting the impact of population growth through demand management and infrastructure investment
- Managing the risks associated with asset failures
- Continuous improvement in asset management practices with the introduction of AssetFinda

The renewals program is intended to demonstrate the Council is managing the assets responsibly by utilising lifecycle management strategies and providing details of associated costs. Key benefits of the Renewals program are:

- Alignment with the Council Asset Management Policy and Infrastructure strategy
- Improved budget forecasting of assets and asset related renewal management and costs
- Managed risk of asset failures
- Improved decision-making based on costs and benefits of alternatives
- Improved accountability over the use of public resources
- Clear justification of forward works programmes and funding requirements for submission into the LTP
- Legislative compliance
- Cost savings by extending the life of assets through refurbishment and condition assessments

One of the primary concerns with regard to asset management is the management and reduction of risk. The Asset Renewals Program manages risk in the following ways:

- Identifying Critical Points in treatment processes and preventing the risk of failure by managing these Critical Points which could lead to fines and/or prosecution

	▪ Preventing interruptions to treatment processes leading to non-compliance with Resource Consents set by Regional Council ▪ Maintaining healthy relationships with Iwi by prioritising the protection of our environment under Kaitiakitanga as denoted in Te Tiriti O Waitangi under Protection, Participation and Partnership
Business Need	To continue to carry out the planned renewals schedule for Wastewater Treatment Civil and Structural works as described in Objective document A304131.

Benefits and Wellbeings (see appendix)

Benefit	How will you quantify and track	Benefit Type	Wellbeing
Proactive renewals minimising the risk of process failure. Maintaining Critical spare stock	Condition assessments over life of the asset Recording reports in AssetFinda	Improved Resilience and Preparedness	Social
Proactively renewing assets to minimise the risk of equipment and/or process failure resulting in resource consent breaches	Plant performance reports Overflow reports Condition assessments in AssetFinda Treatment Operations Team feedback and reports	Legislative Compliance	Economic Cultural
Renewing assets to extend the life and minimise the risk of process failure, getting more value from assets	Condition assessments in AssetFinda Treatment Operations Team feedback and reports Reducing the chance of Resource Consent breaches resulting in abatement notices and fines from regional Council	Cost Avoidance	Economic
Renewing assets and replacing prior to failure to minimise the risk of process failures which can result in overflows to public areas, environment and waterways	Equipment assessments – fit for purpose Condition assessments in AssetFinda Treatment Operations team feedback and reports	Improved Public Health / Safety	Social

Opportunity			
Scope	**In**	**Out**	
	• Condition assessments and data recording • Proactive and planned renewal of assets including replacement • Reactive renewal of assets	• Routine maintenance • Staff time	
Constraints	None	**Assumptions**	Adequate staffing/contractor numbers and skills to carry out the Renewals schedule
Dependencies	None		
Stakeholders	**Internal** ▪ Internal Water and wastewater staff. ▪ TDC Management and 3 Water Operations **External** ▪ Landowners ▪ Waikato Regional Council ▪ Te Toi Ora Lakes District Health Board ▪ Downer and other contractors ▪ Local Iwi ▪ General Public		

Change Mgmt.	Renewals staff weekly team meetings with management. Updating of the renewals schedule as tasks completed. Condition assessment reports loaded into AssetFinda. Monthly Infrastructure meetings. Asset Management Plan.		
Risk of Doing	▪ Unable to complete the renewals program in sufficient time or to an acceptable quality. ▪ Scope of work.	**Commentary**	▪ Insufficient skilled staff or contractor availability to carry out the renewals program ▪ Scope change – projects can snowball larger than budgeted for due to lack of previous investment/investigation
Risk of Not Doing	▪ Increase costs in reactive maintenance. ▪ Risk of overflows resulting in risk to public and environmental health ▪ Non-compliance resulting in abatement notices and fines due to overflows from failing assets ▪ Inaccurate data on asset condition ▪ Unable to maintain full treatment	**Commentary**	▪ Running equipment to failure interrupting processes and increased operational time/costs ▪ Overflows caused by failing assets contaminating water ways and public lands causing health risks and adversely affecting public perception of Council ▪ Potential prosecution ▪ Unknown costs associated to the renewal of the asset resulting in insufficient budget allowance ▪ Non-compliance with Regional Council consents

Options Analysis *(add more options if applicable)*			
	Option One: Do Nothing	**Option Two**	**Option Three**
Overview	Only replace equipment once it has failed.	Condition assess and carry out a proactive renewals program	Extend out condition assessments to reduce planned renewals
Advantages	• None	• Best lifecycle practise • Reduced failures and outages. • Reduced risk of noncompliance and overflows • Reduced operator call outs. • Increased staff satisfaction	• Would reduce renewals budget and expenditure
Disadvantages	• High risk of non-compliance and overflows • Increased equipment failures and delays in replacing. • Increased operator call outs and staff stress and dissatisfaction. • Increased overall cost	• None	• Increased risk of non-compliance • Increased equipment failures • Increased operator call outs and staff stress and dissatisfaction. • Increased overall cost
Costs	Estimated overall cost $5million per year including fines for non-compliance	Average cost per year across the ten years of the LTP $1.55millon	Estimated overall cost $2.5million per year including potential fines for non-compliance
Achievability	Not achievable	100% achievable	75% achievable
Recommendation	Option 2		

RECOMMENDED OPTION

Delivery Approach – How will this initiative be delivered?

- Renewals to be scheduled as per A304131 and transitioned into AssetFinda
- Work to be completed by a combination of TDC staff (Asset Renewals team and Treatment Operations) and preferred contractors

- Condition assessments carried out by TDC and Registered Consulting Engineers (Internal and External)

Project Outputs – the things the project is going to deliver	
Output	**Output Quality Details**
Reduced risk of asset failure	Reducing the risk of treatment plant failure and maintain treatment barriers
Financial accountability	Accuracy of budgeting and spending
Accurate asset trackability	Full life cycle monitoring of asset
Maintaining treatment barriers	Ability to remain compliant with Regional Council Resource Consents

Key Risks – things that provide uncertainty in the project, focus on High risks if possible (see risk matrix in the appendix)			
Risk	**Likelihood**	**Impact**	**Score**
Insufficient funding to complete schedule	2	4	Medium
Unable to complete the schedule within timeframe	3	3	Medium

Project Resource Requirements				
Role	**Primary Responsibilities**	**Internal or External**	**FTE Estimate**	**Duration Estimate**
Asset Renewals and Pools Team Lead	Supervise renewals team, implement renewals schedule, document completed tasks, coordinate contractors/engineers	Internal	1	Ongoing
Asset Renewals and Pools Team x3 staff	Carry out directives from team Lead	Internal	2	Ongoing

Cost Estimate Summary – for recommended option		
Item	**Estimated Cost**	**Capital or Operational**
Assorted civil/structural renewals	Average $450,000/yr	Capital Renewal
Total Estimated cost	$3,910,000 for ten years	Capital Renewal
How accurate are your estimates? 70%		
How will this proposal be funded? LTP budgets		

LTP 2021-2026	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**
Phase (Initiate, Plan, Execute)	$633,000	$405,000	$310,000	$345,000	$325,000
Cost of phase and year spent					

LTP 2027-2031	**Y6**	**Y7**	**Y8**	**Y9**	**Y10**

Phase (Initiate, Plan, Execute)	$390,000	$390,000	$390,000	$380,000	$335,000
Cost of phase and year spent					

LTP Business Case 1 to 3 years

LTP Business Case 1 to 3 years

Project Name	**Wastewater Treatment Electrical & Telemetry Renewals**		
Description	To successfully carry out the renewals program for all Taupo District Council's Wastewater Treatment Electrical & Telemetry Assets		
Business Owner	Kevin Sears	**BC Author**	**Shannon McMillan**
Project Size	Lite	**Project Complexity**	Paint by numbers
Programme	Improve service delivery and reduce risk.	**Location**	Various around Taupo District

Strategic Objectives *(see appendix below to help score Strategic Objectives)*			
		Score	**Project Score Total**
Primary	**Maintaining levels of service** - This project ensures we can continue to deliver services which are Critical for the town/District to Operate	5	10
Secondary	**Being Resilient and Prepared** - Failure to do this project could have a severe impact on the public's health and safety and affect a large number of people	5	

Background

The Wastewater Treatment Electrical & Telemetry assets are part of the wider Water/Wastewater Treatment Renewals program. The purpose of the Renewals Program is to prevent or minimise the risk of assets reaching complete failure by renewing an asset to near new condition or, in some cases, by installing a full replacement.

The renewal schedule is generated by completing condition assessments, tracking this captured data in the asset register Objective spreadsheet WTP Planned Renewals A1728450. As assets are condition assessed, they are re-evaluated and the asset's renewal date adjusted if required. In some cases, assets can be renewed sooner than originally scheduled if the condition has deteriorated sooner than expected or if the benefits outweigh the cost (such as technological advancements, improved efficiencies).

The key elements of the renewals program are:

- Taking a lifecycle approach to managing assets
- Developing cost effective management strategies for the long-term
- Monitoring asset performance
- Understanding and meeting the impact of population growth through demand management and infrastructure investment
- Managing the risks associated with asset failures
- Continuous improvement in asset management practices with the introduction of AssetFinda

The renewals program is intended to demonstrate the Council is managing the assets responsibly by utilising lifecycle management strategies and providing details of associated costs. Key benefits of the Renewals program are:

- Alignment with the Council Asset Management Policy and Infrastructure strategy
- Improved budget forecasting of assets and asset related renewal management and costs
- Managed risk of asset failures
- Improved decision-making based on costs and benefits of alternatives
- Improved accountability over the use of public resources
- Clear justification of forward works programmes and funding requirements for submission into the LTP
- Legislative compliance
- Cost savings by extending the life of assets through refurbishment and condition assessments

One of the primary concerns with regard to asset management is the management and reduction of risk. The Asset Renewals Program manages risk in the following ways:

- Identifying Critical Points in treatment processes and preventing the risk of failure by managing these Critical Points which could lead to fines and/or prosecution

	▪ Preventing interruptions to treatment processes leading to non-compliance with the Resource Consents, Taumata Arowai-the Water Services Bill and Legislation under the Health Act (1956) ▪ Minimising the risk of contamination through asset failure increasing the risk to Public Health on a large scale which in turn will increase demand on health services and impact local business ▪ Minimise adverse public perception and damage to Council's through loss of reputation, contamination events resulting in polluted waterways and closed beaches due to asset failure.
Business Need	To continue to carry out the planned renewals schedule for Wastewater Treatment Electrical & Telemetry assets as described in Objective document WTP Planned Renewals A1728450

Benefits and Wellbeings (see appendix)

Benefit	How will you quantify and track	Benefit Type	Wellbeing
Proactive renewals minimising the risk of process failure. Maintaining Critical spare stock	Condition assessments over life of the asset Recording reports in AssetFinda	Improved Resilience and Preparedness	Social
Proactively renewing assets to minimise the risk of equipment and/or process failure resulting in ineffective treatment of drinking-water	Plant performance reports Overflow reports Condition assessments in AssetFinda Treatment Operations Team feedback and reports Water Outlook Reports	Legislative Compliance	Economic Cultural
Renewing assets to extend the life and minimise the risk of process failure, getting more value from assets	Condition assessments in AssetFinda Treatment Operations Team feedback and reports Reductions in drinking-water transgressions and non-compliance with the DWSNZ Water Outlook Reports	Cost Avoidance	Economic
Renewing assets and replacing prior to failure to minimise the risk of process failures which can lead to drinking-water contamination or loss of supply	Equipment assessments – fit for purpose Condition assessments in AssetFinda Treatment Operations team feedback and reports Water Outlook reports	Improved Public Health / Safety	Social

Opportunity			
Scope	**In**	**Out**	
	• Condition assessments and data recording • Proactive and planned renewal of assets including replacement • Reactive renewal of assets	• Routine maintenance • Staff time	
Constraints		**Assumptions**	Adequate staffing/contractor numbers and skills to carry out the Renewals schedule
Dependencies	None		
Stakeholders	**Internal** ▪ Internal Water and wastewater staff. ▪ TDC Management and 3 Water Operations **External**		

	▪ Landowners ▪ Waikato Regional Council ▪ Te Toi Ora Lakes District Health Board ▪ Downer and other contractors ▪ Local Iwi ▪ General Public		
Change Mgmt.	Renewals staff weekly team meetings with management. Updating of the renewals schedule as tasks completed. Condition assessment reports loaded into AssetFinda. Monthly Infrastructure meetings. Asset Management Plan.		
Risk of Doing	▪ Unable to complete the renewals program in sufficient time or to an acceptable quality. ▪ Scope of work.	**Commentary**	▪ Insufficient skilled staff or contractor availability to carry out the renewals program ▪ Scope change – projects can snowball larger than budgeted for due to lack of previous investment/investigation
Risk of Not Doing	▪ Increase costs in reactive maintenance. ▪ Risk of interruption to treatment processes due to failing assets ▪ Non-compliance resulting in abatement notices and fines due to failing assets ▪ Loss of supply and/or contamination due to failed assets ▪ Inaccurate data on asset condition	**Commentary**	▪ Running equipment to failure interrupting processes and increased operational time/costs ▪ Contamination of drinking-water causing mass illness putting pressure on the health sector and local business due to staffing shortages. ▪ Potential prosecution and/or fines ▪ Adversely affecting public perception of Council ▪ Unknown costs associated to the renewal of the asset resulting in insufficient budget allowance

Options Analysis *(add more options if applicable)*			
	Option One: Change Nothing	**Option Two**	**Option Three**
Overview	Only replace equipment once it has failed.	Condition assess and carry out a proactive renewals program	Extend out condition assessments to reduce planned renewals
Advantages	• None	• Best lifecycle practise • Reduced failures and outages. • Reduced risk of noncompliance and overflows • Reduced operator call outs. • Increased staff satisfaction	• Would reduce renewals budget and expenditure •
Disadvantages	• High risk of non-compliance and overflows • Increased equipment failures and delays in replacing. • Increased operator call outs and staff stress and dissatisfaction. • Increased overall cost	• None	• Increased risk of non-compliance • Increased equipment failures • Increased operator call outs and staff stress and dissatisfaction. • Increased overall cost
Costs	Estimated overall cost $5million per year including fines for non-compliance	Average cost per year across the ten years of the LTP $1.1millon	Estimated overall cost $2.5million per year including potential fines for non-compliance
Achievability	Not achievable	100%	75%
Recommendation	Option 2		

RECOMMENDED OPTION

Delivery Approach – How will this initiative be delivered?
• Renewals to be scheduled as per WTP Planned Renewals A1728450 into AssetFinda • Work to be completed by a combination of TDC staff (Asset Renewals team and Treatment Operations) and preferred contractors • Condition assessments carried out by TDC and Registered Consulting Engineers (Internal and External)

Project Outputs – the things the project is going to deliver	
Output	**Output Quality Details**
Reduced risk of asset failure	Reducing the risk of treatment plant failure and maintain treatment barriers
Financial accountability	Accuracy of budgeting and spending
Accurate asset trackability	Full life cycle monitoring of asset
Maintaining treatment barriers	Ability to remain compliant with Resource Consents from WRC, Taumata Arowai – the Water Services Regulator

Key Risks – things that provide uncertainty in the project, focus on High risks if possible (see risk matrix in the appendix)			
Risk	**Likelihood**	**Impact**	**Score**
Insufficient funding to complete schedule	2	4	Medium
Unable to complete the schedule within timeframe	3	3	Medium

Project Resource Requirements				
Role	**Primary Responsibilities**	**Internal or External**	**FTE Estimate**	**Duration Estimate**
Asset Renewals and Pools Team Lead	Supervise renewals team, implement renewals schedule, document completed tasks, coordinate contractors/engineers	Internal	1	Ongoing
Asset Renewals and Pools Team x3 staff	Carry out directives from Team Lead	Internal	2	Ongoing

Cost Estimate Summary – for recommended option		
Item	**Estimated Cost**	**Capital or Operational**
Assorted Electrical & Telemetry renewals	Average $387,600/yr	Capital renewal
Total Estimated cost	$3,876,000 for ten years	
How accurate are your estimates?	70%	
How will this proposal be funded?	LTP budgets	

LTP 2021-2026	Y1	Y2	Y3	Y4	Y5
Phase (Initiate, Plan, Execute)	$924,000	$364,000	$364,000	$278,000	$308,000
Cost of phase and year spent					

LTP 2027-2031	Y6	Y7	Y8	Y9	Y10
Phase (Initiate, Plan, Execute)	$295,000	$348,000	$352,000	$341,000	$304,000
Cost of phase and year spent					

Approval *If there's been a significant change in scope or change in cost/benefit*
Kevin Strongman
<Date of Approval>

APPENDIX

Project Complexity

Benefits and Wellbeings

Social	Economic	Environmental	Cultural
Improved Public Safety	Cost Reduction	Legislative Compliance	Legislative Compliance
Improved Public Health	Revenue Growth	Reduction in Water Usage	Treaty Settlement Acknowledgement
Legislative Compliance	Revenue Protection	Waste Reduction	Improved Cultural Understanding
Customer Satisfaction	Cost Avoidance	Emissions Reduction	Improve Community Engagement
Empowering People	Process Efficiency	Protecting our Waterways	
Improving Relationships	Brand Awareness	Reduced Emission/Carbon Zero Initiative	
Improve Community Interaction	Legislative Compliance	Improve or Promoting District Sustainability	
Increasing Educational Opportunities	Improve Process Efficiency	Reduced Congestion	
Improve Level of Service	Improve Community affordability		
Increase Community Offerings	Enabling Sustainable Growth		
Improve Community Engagement			
Improve Community Affordability			
Increased Accessibility			
Improved Resilience and Preparedness			
Reduced Congestion			

Strategic Objectives Scoring

Looking after Public Health and Safety

Score	Criteria	Example Project/s
1	Failure to do this project could have a minor impact on the public's health and safety and affect a small number of people	Surface repairs on the velodrome track
2	Failure to do this project could have a moderate impact on the public's health and safety and affect a small number of people	
3	Failure to do this project could have a moderate impact on the public's health and safety and affect a large number of people	
4	Failure to do this project could have a severe impact on the public's health and safety and affect a small number of people	
5	Failure to do this project could have a severe impact on the public's health and safety and affect a large number of people	Water treatment plant upgrade in one of our three main centres

Maintaining Levels of Service

Score	Criteria	Example Project/s
1	This project ensures we can continue to deliver services which are used by a small group of people	Reseal of a club car park, or neighbourhood playground renewal
2	This project ensures we can continue to deliver services which are used by a suburb or neighbourhood	
3	This project ensures we can continue to deliver services which are used by the town or a community	
4	This project ensures we can continue to deliver services which are used by the District	Online LIMS or other online services
5	This project ensures we can continue to deliver services which are Critical for the town/District to Operate	Taupo Water Treatment Plant membrane filtration upgrade

Being Resilient and Prepared

Score	Criteria	Example Project/s
1	Doing this project enables us to respond quickly to a loss of services for a few people	Development of a business continuity plan for a small community or group of people
2	Doing this project reduces the chances of losing services which effects a few people	
3	Doing this project enables us to respond quickly to a loss of services for a small group of people	
4	Doing this project reduces the chances of losing services which affect a small group of people	
5	Doing this project reduces the chances of losing services which are critical for the town/district to operate	Capacity Upgrade of Town Water Treatment Plant, Larger community reservoir construction and burst control valves. Certain Online Services

Being Legislatively Compliant

Score	Criteria	Example Project/s
1	Doing this is best practice	Stormwater improvement devices - downstream defender
2	We have a legislative or regulatory responsibility to undertake this project, however not doing it will have minor impact and is unlikely to result in prosecution	
3	We have a legislative or regulatory responsibility to undertake this project, however not doing it will have a moderate impact and may result in prosecution	Fixing Data related to 3 Waters consent conditions
4	We have a legislative or regulatory responsibility to undertake this project, however not doing it will have a major impact and is likely to result in prosecution	Upgrading water schemes to be compliant with NZDWS
5	Doing this **now** is absolutely mandatory and prosecution is certain	LTP, Annual Plan

Internal Innovation

Score	Criteria	Example Project/s
1	This project leads to minor internal operational efficiencies (such as time and cost savings) through innovative ways of doing things or contributes to an improved employee experience for some employees	Rostering software for a team
2	This project leads to moderate internal operational efficiencies through innovative ways of doing things	Implementation of Smart Trak or Priava booking software
3	This project leads to moderate internal operational efficiencies through innovative ways of doing things that improve our external customer experience	Implementation of online booking forms for Customers
4	This project leads to significant internal operational efficiencies through innovative ways of doing things or contributes to an improved employee experience for all employees	RFID implementation at the library
5	This project leads to significant internal operational efficiencies through innovative ways of doing things that improve our external customer experience	Implementation of Online Property Files and LIMS

Protecting our Environment

Score	Criteria	Example Project/s
1	This project increases our reputation as an environmentally responsible organisation	Enviropods or Roof water recycling tanks for any new buildings
2	This project promotes environmental sustainability or provides a mitigation or adaption to climate change	
3	This project will ensure we are compliant with environmental conditions and/or new environmental standards	Stormwater improvement devices - downstream defender
4	Failure to do this project may lead to prosecution or negative publicity due to environmental damage which will damage our reputation	
5	Failure to do this project will lead to major environmental damage with long lasting effects	Wastewater rising-main (pressure pipe) renewals beside the lake. Those that have failed so now need to be renewed

Economic Development

Score	Criteria	Example Project/s
1	This project will contribute to economic development however the scale is unknown or has not been quantified	Mangakino Sports Changing Facilities
2	This project will contribute to minor economic development or enable another minor economic development project to realise its benefits	
3	This project will contribute to moderate economic development or enable another moderate economic development project to realise its benefits	
4	This project will contribute to significant economic development or enable another significant economic development project to realise its benefits	Great Lake Walkway
5	This project will contribute to ongoing major economic development such as the creation of new jobs, town spend to a value >$1m/year	Ironman, Cycle Challenge

Placemaking

Score	Criteria	Example Project/s
1	Doing this project will enhance the attractiveness of an existing area	Neighbourhood playground renewal
2	Doing this project will provide a positive outcome that enhances the vibrancy and connectedness of the town or community	CBD/Intersection Upgrades
3	Doing this project will provide a positive outcome that enhances the vibrancy and connectedness of a District	
4	Doing this project will create a positive nationwide reputation and leave a lasting legacy for our people	
5	Doing this project will create a positive worldwide reputation and leave a lasting legacy for our people	Otumuheke Hot Pools

Risk Matrix

Likelihood	Consequences				
	Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
Almost Certain 5	Medium	Medium	High	Extreme	Extreme
Likely 4	Low	Medium	High	High	Extreme
Moderate 3	Low	Medium	Medium	High	High
Unlikely 2	Insignificant	Low	Medium	Medium	Medium
Rare 1	Insignificant	Insignificant	Low	Low	Medium

LTP Business Case 1 to 3 years

Project Name	**Wastewater Treatment Mechanical Renewals**		
Description	To successfully carry out the planned renewals of all TDC's Wastewater Treatment Plant's Mechanical Assets		
Business Owner	Kevin Sears	**BC Author**	**Shannon McMillan**
Project Size	Lite	**Project Complexity**	Paint by numbers
Programme	Improve service delivery and reduce risk.	**Location**	Various around Taupo District

Strategic Objectives *(see appendix below to help score Strategic Objectives)*			
		Score	**Project Score Total**
Primary	**Maintaining levels of service** - This project ensures we can continue to deliver services which are Critical for the town/District to Operate	5	10
Secondary	**Being Resilient and Prepared** - Failure to do this project could have a severe impact on the public's health and safety and affect a large number of people	5	

Background

The Wastewater Civil/Structural assets are part of the wider Water/Wastewater Treatment Renewals program. The purpose of the Renewals Program is to prevent or minimise the risk of assets reaching complete failure by renewing an asset to near new condition or, in some cases, by installing a full replacement.

The renewal schedule is generated by completing condition assessments, tracking this captured data in the asset renewals schedule Objective spreadsheet A1728463 WWTP Planned Renewals and the condition of assets tracked in Objective spreadsheet A304131 Wastewater Treatment Asset Condition and Renewals Plan. As assets are condition assessed, they are re-evaluated and the asset's renewal date adjusted if required. In some cases, assets can be renewed sooner than originally scheduled if the condition has deteriorated sooner than expected or if the benefits outweigh the cost (such as technological advancements, improved efficiencies).

The key elements of the renewals program are:

- Taking a lifecycle approach to managing assets
- Developing cost effective management strategies for the long-term
- Monitoring asset performance
- Understanding and meeting the impact of population growth through demand management and infrastructure investment
- Managing the risks associated with asset failures
- Continuous improvement in asset management practices with the introduction of AssetFinda

The renewals program is intended to demonstrate the Council is managing the assets responsibly by utilising lifecycle management strategies and providing details of associated costs. Key benefits of the Renewals program are:

- Alignment with the Council Asset Management Policy and Infrastructure strategy
- Improved budget forecasting of assets and asset related renewal management and costs
- Managed risk of asset failures
- Improved decision-making based on costs and benefits of alternatives
- Improved accountability over the use of public resources
- Clear justification of forward works programmes and funding requirements for submission into the LTP
- Legislative compliance
- Cost savings by extending the life of assets through refurbishment and condition assessments

One of the primary concerns with regard to asset management is the management and reduction of risk. The Asset Renewals Program manages risk in the following ways:

- Identifying Critical Points in treatment processes and preventing the risk of failure by managing these Critical Points which could lead to fines and/or prosecution

	▪ Preventing interruptions to treatment processes leading to non-compliance with Resource Consents set by Regional Council ▪ Maintaining healthy relationships with Iwi by prioritising the protection of our environment under Kaitiakitanga as denoted in Te Tiriti O Waitangi under Protection, Participation and Partnership
Business Need	To continue to carry out the planned renewals schedule for Wastewater Treatment Mechanical Asset renewals as described in Objective document A304131.

Benefits and Wellbeings (see appendix)

Benefit	How will you quantify and track	Benefit Type	Wellbeing
Proactive renewals minimising the risk of process failure. Maintaining Critical spare stock	Condition assessments over life of the asset Recording reports in AssetFinda	Improved Resilience and Preparedness	Social
Proactively renewing assets to minimise the risk of equipment and/or process failure resulting in resource consent breaches	Plant performance reports Overflow reports Condition assessments in AssetFinda Treatment Operations Team feedback and reports	Legislative Compliance	Economic Cultural
Renewing assets to extend the life and minimise the risk of process failure, getting more value from assets	Condition assessments in AssetFinda Treatment Operations Team feedback and reports Reducing the chance of Resource Consent breaches resulting in abatement notices and fines from regional Council	Cost Avoidance	Economic
Renewing assets and replacing prior to failure to minimise the risk of process failures which can result in overflows to public areas, environment and waterways	Equipment assessments – fit for purpose Condition assessments in AssetFinda Treatment Operations team feedback and reports	Improved Public Health / Safety	Social

Opportunity			
Scope	**In**	**Out**	
	• Condition assessments and data recording • Proactive and planned renewal of assets including replacement • Reactive renewal of assets •	• Routine maintenance • Staff time	
Constraints	None	**Assumptions**	Adequate staffing/contractor numbers and skills to carry out the Renewals schedule
Dependencies	None		
Stakeholders	**Internal** ▪ Internal Water and wastewater staff. ▪ TDC Management and 3 Water Operations **External** ▪ Landowners ▪ Waikato Regional Council ▪ Te Toi Ora Lakes District Health Board ▪ Downer and other contractors ▪ Local Iwi ▪ General Public		

Change Mgmt.	Renewals staff weekly team meetings with management. Updating of the renewals schedule as tasks completed. Condition assessment reports loaded into AssetFinda. Monthly Infrastructure meetings. Asset Management Plan.		
Risk of Doing	▪ Unable to complete the renewals program in sufficient time or to an acceptable quality. ▪ Scope of work.	**Commentary**	▪ Insufficient skilled staff or contractor availability to carry out the renewals program ▪ Scope change – projects can snowball larger than budgeted for due to lack of previous investment/investigation
Risk of Not Doing	▪ Increase costs in reactive maintenance. ▪ Risk of overflows resulting in risk to public and environmental health ▪ Non-compliance resulting in abatement notices and fines due to overflows from failing assets ▪ Inaccurate data on asset condition	**Commentary**	▪ Running equipment to failure interrupting processes and increased operational time/costs ▪ Overflows caused by failing assets contaminating water ways and public lands causing health risks and adversely affecting public perception of Council ▪ Potential prosecution ▪ Unknown costs associated to the renewal of the asset resulting in insufficient budget allowance

Options Analysis *(add more options if applicable)*			
	Option One: Do Nothing	**Option Two**	**Option Three**
Overview	Only replace equipment once it has failed.	Condition assess and carry out a proactive renewals program	Extend out condition assessments to reduce planned renewals
Advantages	• None	• Best lifecycle practise • Reduced failures and outages. • Reduced risk of noncompliance and overflows • Reduced operator call outs. • Increased staff satisfaction	• Would reduce renewals budget and expenditure
Disadvantages	• High risk of non-compliance and overflows • Increased equipment failures and delays in replacing. • Increased operator call outs and staff stress and dissatisfaction. • Increased overall cost	• None	• Increased risk of non-compliance • Increased equipment failures • Increased operator call outs and staff stress and dissatisfaction. • Increased overall cost
Costs	Estimated overall cost $5million per year including fines for non-compliance	Average cost per year across the ten years of the LTP $1.55millon	Estimated overall cost $2.5million per year including potential fines for non-compliance
Achievability	Not achievable	100% achievable	75% achievable
Recommendation	Option 2		

RECOMMENDED OPTION

Delivery Approach – How will this initiative be delivered?

- Renewals to be scheduled as per A304131 and transitioned into AssetFinda.
- Work to be completed by a combination of TDC staff (Asset Renewals team and Treatment Operations) and preferred contractors
- Condition assessments carried out by TDC and Registered Consulting Engineers (Internal and External)

Project Outputs – the things the project is going to deliver	
Output	**Output Quality Details**
Reduced risk of asset failure	Reducing the risk of treatment plant failure and maintain treatment barriers
Financial accountability	Accuracy of budgeting and spending
Accurate asset trackability	Full life cycle monitoring of asset
Maintaining treatment barriers	Ability to remain compliant with Regional Council Resource Consents

Key Risks – things that provide uncertainty in the project, focus on High risks if possible (see risk matrix in the appendix)			
Risk	**Likelihood**	**Impact**	**Score**
Insufficient funding to complete schedule	2	4	Medium
Unable to complete the schedule within timeframe	3	3	Medium

Project Resource Requirements				
Role	**Primary Responsibilities**	**Internal or External**	**FTE Estimate**	**Duration Estimate**
Asset Renewals and Pools Team Lead	Supervise renewals team, implement renewals schedule, document completed tasks, coordinate contractors/engineers	Internal	1	Ongoing
Asset Renewals and Pools Team x3 staff	Carry out directives from team Lead	Internal	2	Ongoing

Cost Estimate Summary – for recommended option		
Item	**Estimated Cost**	**Capital or Operational**
Assorted mechanical renewals	Average $740,600/yr	Capital renewal
Total Estimated cost	$7,406,000 for ten years	
How accurate are your estimates? 70%		
How will this proposal be funded? LTP budgets		

LTP 2021-2026	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**
Phase (Initiate, Plan, Execute)	$924,000	$800,000	$800,000	$610,000	$678,000
Cost of phase and year spent					

LTP 2027-2031	Y6	Y7	Y8	Y9	Y10
Phase (Initiate, Plan, Execute)	$648,000	$765,000	$770,000	$748,000	$670,000
Cost of phase and year spent					

LTP Business Case 1 to 3 years

Wastewater Discharge Consent Compliance Summary

	Consnet No.	Date of last WRC audit	Compliance status	Non-compliant Condition		Reason for NC	Condition compliance status	Required Action	Due date for corrective action	Comments
Wastewater										
Acacia Bay	122518	24/10/2018	Full compliance	3	Maximum volume of wastewater <920 m3/day	Disposal volumes were not metered, influent was used as a surrogate	Minor technical non-compliance	NIL		Flow meter reporting data post audit
				11	Discharge quality limits	With the exception of effluent flow monitoring, the condition was met	Minor technical non-compliance	NIL		
Atiamuri	109488	20/09/2017	Full Compliance							
Kinloch	113402	6/12/2019	Partial Compliance	5	TN <380 kg/year ; the annual average daily flow < 170 m3/day	Additional flow balancing capacity not yet installed but TDC seeking change to consent due to proposed WWTP upgrade which does not require balancing tank. TN discharge 716 kg, average daily discharge = 267 m3/day	Medium Priority non-complaince	Confirm proposal and associated timeframes with regard to plant upgrades and and s127 application required	30/11/2019	s127 now received.
		16/03/2020	**Formal Warning**	10		Expansion of land disposal system by installing 3 soak holes unauthorised under consent and is not a permitted activity		Submit report to WRC detailing: 1. As-built designs and locations of all soak holes constructed; and 2. TDC's proposal, including timeframes, to either decommission the unauthorised soak holes or authorise them by way of consent	30/04/2020	
Mangakino	951023	15/02/2018	Full compliance							Compliance assessment currently being undertaken by WRC - report pending
Motuoapa	122515	14/11/2018	High level of compliance	4	The quality of the treated wastewater discharged to the ground shall comply the limits	Median TN load non-complaince a recurring (although improved) issue, the exact cause of which is not determined, but correlates to changes in influent quality	Low priority non-compliance	Report detailing actions proposed to adress the intrusion of groundwater to the Motuoapa wastewater network and associated effects on WWTP operation		
				13	OMP shall be prepared by a suitably qualified and experienced person	OMP review was planned for after upgrade and is still outstanding	Minor technical non-compliance	Confirm status of OMP review and timeframe for completion and provision to WRC	30/01/2019	
				22	Disposal field capacity review	Work not yet undertaken and overdue	Minor technical non-compliance	Confirm in writing the fieldwork component of this work has been undertaken	28/02/2019	
Motutere	950671	29/05/2013	Full compliance							Compliance assessment currently being undertaken by WRC - report pending
Omori	135810	21/02/2019	High Level of Compliance	3	Volume of treated effluent <800 m3/day	Metering issues with discharge meter persist, accurate effluent data unavailable	Low priority non-complaince	Confirm details of proposed discharge meter system works, and the anticipated timeframe for implementation of accurate discharge metering	31/01/2020	
				4	The rate of treated wastewater dischargeed to ground	Compliance is likely but can't be determined absolutely due to inaccurate effluent flow meter	Low priority non-compliance	Confirm details of proposed discharge meter system works, and the anticipated timeframe for implementation of accurate discharge metering	31/01/2020	
Taupō	116596	17/12/2019	High Level of Compliance	4	Effluent hydraulic loading rates <45 mm/week, 15 mm/day and 5 mm/hr	Hydraulic loading rates reported for may and june 2019 only, following replacement of pivot flow meters	Low-priority non-compliance	No further actions requested		
				7A	maintain a specified irrigation free buffer zone from areas of sensitive development		Full compliance	Identify areas of 'sensitive development' undertaken in land surrounding the View Road LDS and proposed expansion area and detail the setbacks in place, as part of the next annual compliance report	31/08/2020	Completed
				25	Consent holder shall keep records of dates of irrigation, location, volume of wastewater applied to each block and the rotation period between successive irrigation events	Unavailability of individual pivot meters for the first 10 months of compliance - individual block data is only available for May and June 2019.	Low priority non-compliance	Ensure that records of wastewater irrigated are captured on a per block basis and reported as part of the next annual report	31/08/2020	Completed
	930464	17/12/2019	Partial compliance	f	Median faecal coliform concentration of effluent < 3.0 $x10^6$ colonies/100 ml	Median limit exceeded throughout year. Ongoing non-compliance attributed to poor performance of trickling filter which TDC is actively trying to optimise.	Low priority non-compliance	No actions required		
				j	Maximum rate of irrigation is 35 mm/week	Enhanced irrigation data capture is now reported with 7-day rolling summaries of irrigation rates. Enhanced reporting highlights non-compliance with hydraulic loading rate for all 8 zones. NC weekly loadings occur when blocks are being harvested which aplies pressure to the remaining blocks.	Medium Priority non-complaince	Provide a comprehensive update regarding steps being taken to bring hydraulic loading rates into compliance with authorised limit including: details of irrigation strategy optimisation work, anticipated outcomes of optimisation work and details of irrigation expansion proposal, including timeframes	28/02/2020	
Turangi	102927	12/11/2018	High Level of Compliance	9	Quality of discharge meets consent limits detailed in table	Three non-compliances are considered minor. Planned (and undertaken) maintenance considered relative to NC's and no corrective actions required	Low priority non-compliance			
Whakamaru	130354	27/11/2017	High Level of Compliance	9	Contribute up to $30,000 to enable lakeshore enhancement works along the western bank of Lake Whakamaru and provide a copy of lake shore enhancement plan within 6 months of consent granting	Work has been made towards development of the plan but it is not yet submitted	Low priority non-compliance	Supply the finalised Planting Plan and evidence of funding availility, as part of the 2018 Annual Compliance Report		Completed
Whareroa	138347.01.01	14/10/2019	Full compliance	8	Develop and retain an Operations and Management Plan, submitted within 6 months of commencement of consent (due 24 July 2019)	The OMP was due 24 July 2019 and is yet to be submitted (or completed)	Minor technical non-compliance	Supply a copy of the updated Operations and Management Plan	31/12/2019	
				25	Forward results of the monitoring undertaken pursuant to conditions 19 and 20 quarterly	Quarterly data has not been supplied	Minor technical non-compliance	Provide quarterly data on an on-going basis		

ASSET MAINTENANCE, RENEWAL AND CAPITAL EXPENDITURE POLICY

PURPOSE

The Asset Management Policy is aligned with Council's vision "To be the most prosperous and liveable district in the North Island by 2022" and the long-term strategic goals found in the 2018 LTP of:

- Ensure that the Taupo District remains a great place to live
- Promote economic development
- Protect our water resources and use them wisely
- Maintain the quality infrastructure that we have
- Keep rates and debt affordable

OBJECTIVE

The objective of Council's Asset Management Policy is to:

- ensure service delivery is optimized to deliver agreed community outcomes and levels of service for both residents, visitors and the environment
- optimize expenditure over the life cycle of the assets
- risks and opportunities are identified and managed appropriately
- provide a
- service delivery that is sustainable for today and future generations

PRINCIPLES

The following principles will be used by Council to guide asset management planning and decision making:

- effective consultation with the community to determine appropriate levels of service
- Integration of asset management within Council's strategic, tactical and operational planning frameworks including corporate, financial, and business planning
- Informed decision making using lifecycle cost and risk management and the inter-generational approach
- Transparent and accountable asset management decision making
- Sustainable management of assets for present and future needs

CORPORATE FRAMEWORK

This Asset Management Policy links to Council's LTP, Infrastructure and Financial Strategy and Asset Management Plans. It builds on Council's strategic goals by promoting an integrated approach to the management of service delivery and across all asset classes.

STRUCTURED ASSESSMENT of ASSET MANAGEMENT PRACTICE

Council has undertaken a structured assessment of the appropriate level of asset management practice for each of the asset classes. This structured assessment follows the guidelines provided in Section 2.1.3 of the International Infrastructure Manual (IIMM 2011v4). The level of maturity determined for each asset class can be found in Section 1 - Introduction of the respective Asset Management Plan.

REVIEW of POLICY

This Asset Management Policy has informed the development of the 2018 asset management plans. It will be reviewed prior to undertaking asset management plan updates to support the 2021 LTP.

MATURITY ASSESSMENT

In the first quarter of 2015 the maturity level of each of the Asset Management Plans was assessed through an external review process to determine the actual level of maturity. This review formed the basis for the further refinement of each of the AMP's Improvement plans.

Further assessments will be undertaken every three years to determine the progress of improvements to the maturity level of the AMP's.