KAWERAU DISTRICT COUNCIL
Asset Management Plan 2025

Wastewater

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Version History

Version	Date	Notes	Author
2015	2015	Final version: AMP - 2015	Tom McDowall
1a	09/02/2018	First revision for 2018	Hanno vd Merwe
1b	15/02/2018	Review: Technical support officer	Tina Mitchell
1c	23/02/2018	Update after MOS review	Hanno vd Merwe
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2a	23/11/2020	First Revision for 2020	Tina Mitchell
2b	8/04/2021	Three Waters Review	Riaan Nel
2c	12/04/2021	Management Review	Hanno vd Merwe
2d	20/07/2021	Post Audit Review amendments	Tina Mitchell
3	1/08/2021	Submission to Council	Hanno vd Merwe
3a	7/05/2024	First Revision for 2024	Hanno vd Merwe
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4a	26/03/2025	GMOS review of AMP	Riaan Nell
4b	7/4/2025	A & R Committee review	

SECTION ONE

Executive Summary

PURPOSE OF THE PLAN

The overall purpose of this Asset Management Plan is to describe Council's strategy for the management of its wastewater assets. The Plan enables Council to meet the present and expected future needs of the Community over a ten year period (according to the 10 year Long Term Plan) and into the future (according to the 30 year Infrastructure Strategy).

The Plan details the assets Council owns and describes how the maintenance, renewal and replacement of these assets will be managed and funded to meet required levels of service for Council's wastewater activity in the most cost effective way for households and businesses.

The Asset Management Plan collates high level management, financial, engineering and technical information from various sources into a single document. It is a tool for communicating complex asset management information and strategies with stakeholders and interested parties.

An independent auditor evaluated the level of provision of asset management for the wastewater asset in 2017. The appropriate level was recommended to be raised from the Council's asset management policy of "Core" to "Intermediate" due to the higher risk to the health and well-being of the community in the event of wastewater assets failing to deliver an appropriate level of service.

The previous assessment of the asset management level and the level required for "Intermediate" showed a gap of 10 percent overall for the wastewater activity. Asset management improvements were identified in 2021 and completed by 2024 to close this gap. The remaining and newly identified improvement actions are discussed in Section 0.

ASSET DESCRIPTION

The community is served by a wastewater system designed to manage wastewater collection, treatment and disposal. It has one reticulated wastewater network, servicing around 2,880 properties including approximately 180 businesses. Four large industrial plants use the network to dispose of domestic waste. One business, the Waiū dairy factory is consented and charged for the disposal of trade waste via the wastewater system since June 2019.

Properties connect to the public reticulation system through small pipes. Larger pipes and manholes are used in the network where changes in gradient and direction occur. There are also six pump stations. All wastewater is brought to the treatment plant. Treatment and the discharge of water to ground are carried out in accordance with resource consent requirements and to maintain a healthy environment. Septic tanks are used for the few properties in the district not connected to the network.

The table below summarises the key components of the system including additional infrastructure following the residential developments of Porritt Glade and Central Cove.

Key components

Number of properties connected – including laterals	2880
Length of reticulation (kms)	62.6
Number of pumping stations	6
Number of treatment plants	1
Manholes	772
Wastewater treated (avg m^3/d)	2,200

The 2022 replacement cost and depreciated replacement values of the wastewater asset are shown below:

Replacement and depreciated values

Asset Type	Gross Replacement	Depreciated Replacement Cost
Pipelines	$22,882,400	$6,188,090
Laterals	$881,500	$392,300
Manholes	$3,410,640	$785,570
Pumping Stations	$567,970	$424,720
Screening	$2,679,100	$1,914,880
Treatment Plant	$7,070,790	$4,059,700
TOTAL	**$37,492,400**	**$13,765,260**

LEVELS OF SERVICE

Customer levels of service

Council monitors and reports its actual performance against measures and targets contained in the Long Term Plan.

Council targets includes community satisfaction, number of complaints, the number of service requests and time taken to respond as well as number of supply disruptions and failures. The community survey undertaken in 2023 reported 82% resident satisfaction with the wastewater service, which is above the national average (74%).

Technical levels of service

Council seeks to maintain and operate a wastewater system in a manner that is fit for purpose and does not compromise public safety. It also seeks to comply with its wastewater resource consents at all the times.

Constraints to levels of service

Constraints can arise because of capacity, reliability and security of service, environmental performance and issues relating to the treatment, storage and reticulation. These constraints are described fully in section 0 of the Plan.

Resource consents

Council holds resource consents from the BOP Regional Council for the discharge of treated wastewater from the treatment plant and the breakdown of wastewater solids. Consent conditions relate to the volume, quality and rate of wastewater discharge and its effects on groundwater quality.

Significant adverse effects

Potential adverse effects are: the overflow of sewage due to pipe blockages and failure of the treatment plant - exceeding one day. This would have environmental and potential health effects for the community (i.e. impact the environmental and social wellbeings).

FUTURE NEEDS

Kawerau's wastewater network is adequate for current demands and most of the network has some spare capacity.

The Kawerau district has experienced low general population growth and therefore low demand for additional services, however the district has continued to experience a consistent increase in residents over the age of 65. In the 2013 census, the total population of the Kawerau District was 6,363, a decrease of 8.1% or 561 people since the 2006 census. Despite a predicted further decline, the 2018 census showed a growth of general population to 7,460. The Kawerau district estimated population according to the 2023 census is 7,820 which represented a 4.8% increase in population since 2018 or around 1% population growth per annum.

Council hopes to bolster these gains with economic development initiatives, such as the development of a new industrial park and promotion of the natural environment.

The existing wastewater network has excess capacity enabling it to cope with any reasonable increase in demand. A boundary adjustment was carried out in 2012 with the subsequent initial development of the new industrial park. Council constructed a new wastewater service line to the new industrial park on SH34 in response to this and the new Waiū dairy factory came online with a consent to dispose of trade waste in June 2019.

LIFE CYCLE MANAGEMENT

Assets

Service connections

Service connections connect properties and businesses wastewater lines to gravity reticulation pipes. Service connections may be Asbestos Cement (AC), glazed earthenware, Polyvinyl Chloride/Plastic (PVC), Polyethylene (PE), concrete lined steel or concrete, depending on when a property was developed.

Gravity reticulation pipes

Gravity lines connect service connections and properties and businesses wastewater lines to pump stations and eventually to the treatment plant. Depending on location and age, the pipes are asbestos cement, concrete, concrete lined steel, PVC, PE or glazed earthenware.

Rising pipes

Rising pipes are pressurised pipes that connect pumping stations (both Council and private) to receiving gravity reticulation pipes.

Pump stations

There are six pump stations, two pumps effluent from Council facilities, one pumps trade waste from the industrial block, two pump wastewater from low lying housing areas and one pumps wastewater from an out of district marae and attached dwelling.

Treatment plant

There is a single modern plant that removes solids from the wastewater. The solids are disposed of by vermiculture and the effluent is discharged to rapid infiltration basins.

Manholes

Manholes are used at changes in pipeline gradient, direction, and diameter or at multiple service connections.

Critical Assets

Most components of the wastewater asset are able to fail for a period of up to 24 hours before intervention is required. Intervention is simple and relatively inexpensive and therefore only a small number of pipes, one pump station and the treatment plant are considered critical.

New assets

The two resource consents for the wastewater treatment plant extend beyond the length of this plan so there is no requirement to improve its efficiency during the life of the plan. The proposed new industrial park is not expected to increase flows by more than five percent.

New network assets from recent land developments are vested in Council.

Maintenance activities

Beyond the geothermal area of town that requires renewal work, the wastewater network is in good condition. Council intends to operate, maintain and renew the network so that it continues to provide the level of service required in the future. Regular, ongoing maintenance including the removal of problematic street trees will allow the existing levels of service to continue indefinitely.

Renewal/Replacement

Pipes generally deteriorate in line with the National Asset Management Steering Group (NAMS) guidelines with the exception of an area of geothermal activity that includes Kawerau's town centre.

Council's objective is to maximise asset life without compromising service. Replacement decisions are based on the condition, reliability and maintenance cost and risk profile of an asset as well as its age.

The network has been divided into six zones: the first 5 zones are based on the estimated average date of development. The sixth zone is the geothermal area where concrete pipe has been replaced and relined with PE pipe.

The zones are:

1. 1955-1958 (~25,000 m)
2. 1962-1970 (~8,800 m)
3. 1973 (~9 600 m)
4. 1978 (~7 100 m)
5. 1980-1996 (~6 600 m)
6. 2000 to present (~2,900 m)

Deferred Maintenance and Disposal Plan

Council policy is to avoid any deferred maintenance and currently there is no known deferred maintenance for the wastewater network. Similarly, there are no specific disposals identified in the Plan.

FINANCIAL SUMMARY

Kawerau's wastewater asset is adequate for the current and foreseen population and industrial needs.

The funding for wastewater operation and replacement is from rates. The funding collected in excess of the actual replacement is being held in the depreciation reserve. At some stage of the replacement cycle the depreciation reserve will go into deficit and Council will raise loans to fund this deficit.

The model for replacement of wastewater pipes is reasonably accurate as the pipes lives have been verified by physical testing and pipe failures has also confirmed the deterioration rates.

ASSET MANAGEMENT SYSTEMS AND PROCESSES

Asset management outcomes

Responsibility for asset management outcomes lies with the Group Manager, Operations and Services.

Accounting and asset management systems

Ozone software is used for accounting and billing. All formal asset management financial reporting including valuation is currently held in Excel spreadsheets. This is being migrated to the AssetFinda system.

The improvement plan proposes that all appropriate financial information be inputted into AssetFinda.

Hard copy plans contain layout details of the structures and all known pipes comprising the wastewater network. Over time these will become obsolete as new information is held on AssetFinda.

Key information flows and processes

Key information flows and process linkages relate to the incorporation of Kawerau's community outcomes, the preparation and adherence to Council's annual budgets, environmental monitoring and compliance and to ongoing asset management that maintains levels of service to the community.

MONITORING AND IMPROVEMENT PLANNING

Planned improvements are outlined in section 0 of the Plan. Key improvement activities centre on continuing to increase the accuracy of Council's information relating to the wastewater assets.

The Group Manager Operations and Services will monitor and review improvement items on a six monthly basis. The improvement plan will be reviewed each year as part of the annual plan development process.

SECTION TWO

Introduction

PURPOSE OF THE PLAN

The overall purpose of this Asset Management Plan is to describe Council's strategy for the management of its wastewater assets. The Plan enables Council to meet the present and expected future needs of the community over a ten year period (according to the 10 year Long Term Plan) and into the future (according to the 30 year Infrastructure Strategy).

The plan details the assets Council owns and describes how the maintenance, renewal and replacement of these assets will be managed and funded to meet required levels of service for Council's wastewater activity in the most cost effective way.

The asset management plan collates high level management, financial, engineering and technical information from various sources and combines these into a single document. It is a tool for communicating complex asset management information and strategies with stakeholders and interested parties.

ASSET DESCRIPTION

Council's wastewater system collects, treats and dispose of wastewater (sewage) from properties in the district. Its components are a network of underground pipes, pumping stations and a treatment plant with soakage basins. Wastewater enters the network from properties connected to the system and is conveyed to the treatment plant where it is treated and then disposed of via rapid infiltration basins and by vermicomposting.

The wastewater network, serves around 2,880 properties including 180 businesses. Four large industrial plants use the network to dispose of domestic wastewater, and one factory has a trade waste consent.

Properties are connected to the public reticulation system through small pipes called service connections. These pipes are generally the responsibility of the property owner. Where a portion of connection passes outside the property boundary to connect to the wastewater network is deemed to belong to Council.

The wastewater network includes 150 – 450mm pipes and manholes where changes in gradient and direction occur. There are pump stations to lift effluent from low lying areas to the gravity network.

All wastewater is brought to the treatment plant. Here the solids are removed and the liquid soaks to ground in rapid infiltration basins where the soil removes bacteria. The discharge of water to ground and the treatment of the removed solids are carried out to meet resource consent requirements and maintain a healthy environment.

Council measures the total solids content and the quantity of the treated water going to the rapid infiltration basins. This information is provided to the BOP Regional Council as required in the resource consents.

The key components of the Kawerau wastewater system are listed in the following table:

Table 37: Key components

Number of properties connected	2880
Length of reticulation (kms)	62.6
Number of pumping stations	6
Number of treatment plants	1
Manholes	772
Wastewater treated (avg m^3/d)	2,200

Septic tanks are used for the few houses in the district not connected to the network.

OBJECTIVES OF ASSET OWNERSHIP

The goal of the wastewater activity is to provide a quality wastewater removal, treatment and disposal service to meet reasonable community needs that enhances community health and safety and the environment.

Council is obligated by the Health Act 1956 and the Building Act 2004 and is supported by the powers given to local authorities in the Local Government Act 2002 (LGA) and other legislation to provide wastewater services.

Section 23 of the Health Act 1956 imposes a general duty on Councils to improve, promote, and protect public health within their District. In particular Section 23(c) imposes a duty on Councils to cause all proper steps to be taken to secure the abatement of the nuisance or the removal of the condition. It would be virtually impossible for Council to fulfil this obligation without reticulated wastewater in the urban area.

The activity involves:

- Management and monitoring of wastewater assets and wastewater disposal.
- Repairing or replacing unsound pipes and other wastewater structures and plant.
- Operating the wastewater treatment plant.
- Planning for future requirements and improving operations.

Council's principal objectives are:

- To ensure that the wastewater network continues to provide a high quality collection, treatment and disposal service.
- To anticipate the time when it becomes necessary to extend, upgrade or renew the

existing wastewater network, and to plan accordingly.

To ensure the appropriate maintenance of the wastewater network in perpetuity, so that there is no diminution in value and to forecast the estimated future cost of doing so.

To put in place a sound management regime for all matters relating to the wastewater network.

CONTRIBUTION TO COMMUNITY OUTCOMES

The Council community outcomes to which the wastewater activity primarily contributes are set out in

Table 38 below.

LINKS TO OTHER STRATEGIC DOCUMENTS

Public infrastructure contributes toward the economic, social, cultural and environmental wellbeing of the community. In addition to wastewater infrastructure, Council owns the water supply and stormwater systems, the district's roads and footpaths, and its public parks, reserves, buildings and facilities. The parts making up those networks and structures and the tools and equipment used to manage and maintain them, are Council's assets.

The 30 year planning strategy for Council's four critical asset groups, Roading, Stormwater, Water Supply and Wastewater, is described in the Infrastructure Strategy.

Every three years Council develops a Long Term Plan setting out the range and level of services it will provide to meet identified community needs and community outcomes and indicates anticipated expenditure on assets for the next 10 years. Each year Council adopts an Annual Plan, containing the budget for council services. Council's ability to deliver services and to do so at a reasonable cost depends on the condition, performance and risk profile of its assets.

In this way, Council's asset management planning is closely linked to its Infrastructure Strategy, Long Term Plan and Annual Plans

This Asset Management Plan was developed in conjunction with the Kawerau District Council Long Term Plan 2025-2034. It will underpin and be integrated into that document, and the subsequent Annual Plans.

Table 38: Contribution to Community Outcomes

Contribution	Outcome
Continuity of sewage collection.	Council infrastructure and services are accessible, age-friendly, effective, efficient and affordable, now and for the future.
Management and monitoring of sewage disposal.	Council regulates, monitors and acts to protect public health and safety, to prevent harm and nuisance and to improve standards in Kawerau's home, commercial and public environments.

SECTION THREE

Levels of Service

CUSTOMER LEVELS OF SERVICE

Council commissions an independent survey every 3 years to measure the level of customer satisfaction with the services provided by Council. The results of these surveys for the wastewater activity are shown below.

The survey for 2023 was undertaken by SIL Research and for the years prior it was undertaken by the National Research Bureau.

Table 39: Survey Results – Wastewater Supply

%	2008	2009	2011	2014	2017	2020	2023
Very/Fairly Satisfied	96	99	96	97	91	95	70
Not very Satisfied	1	-	-	2	2	2	15
Don't Know	3	1	4	1	6	3	15

Table 40: Survey Results – Reasons Residents were not very satisfied

	2008	2009	2011	2014	2017	2020	2023
Odour				1	1		2
Blocked sewer lines				1			4
Poor toilet flushing		1			1		
Sewage overflow			1	1			
Overall system							7
Communication/Other						2	2

TECHNICAL LEVELS OF SERVICE

Council will continue to monitor and report its actual performance against measures and targets described in the LTP. Performance progress (towards achieving targets) is reported quarterly to Council by the Group Manager, Operations and Services.

Table 6: Technical Levels of Service (LOS)

Level of Service	Performance Measure
Provision of a reliable domestic wastewater collection and disposal service	Continuity of service 365 days a year No more than 50 disruptions of service per year >97% Community satisfaction (measured 3 yearly) Zero allowance for Dry Weather Overflows
The total number of complaints received	Complaints per 1000 connections for each criteria • Odour – No more than 1 • System Faults – No more than 15 • Blockages – No more than 15 • Council's response – Nil allowable
Wastewater treatment plant operation	Maintain compliance with resource consents conditions
Callout and fault response times	Sewage overflow report call outs: 1 hr attendance with 8 hrs resolution
Minimal environmental effects	Maintain compliance with resource consents conditions

CONSTRAINTS TO LEVELS OF SERVICE

The constraints impacting on levels of service of the wastewater network are shown in the table below.

Table 7: Constraints to Levels of Service

Constraint	Component	Comments
Capacity	Service Connections	There are no known constraints of capacity associated with wastewater network connections.
	Public Networks	There are no known constraints of capacity with the current network of pipes. Fat build ups and tree roots temporarily reduce capacity from time to time. Rain inflow and infiltration occurs during heavy rainfall. Investigation into where this is happening is undertaken and appropriate action instigated.
	Treatment Plant	The treatment plant has capacity to cater for a population 30% higher than current.
	Consents	The consents limit the level of treated liquid that can be disposed of to the Rapid Infiltration Basins (RIBs). The consent allows for twice the current disposal.
Reliability and Security of Service	Network blockages	Limited storage capacity is available in line. However, most storage capacity is used by the time the blockage is detected. Unused storage capacity may provide sufficient time to undertake repair or arrange pumping without significant spillage. Clearance of most blockages is attended to quickly.
	Pump Stations	The pump stations each have at least two pumps. This provides standby pumping capacity if one pump fails or requires repair. In addition, pump stations are able to be pumped out using portable pumps or sucker trucks.
	Treatment Plant	The critical mechanical and electrical pumps, fans and gearboxes are duplicated so that plant can be run at slightly below maximum performance for long periods. A stock of critical replacement parts is held on site and Kawerau is well serviced with industrial technicians. A spill basin has the capacity to hold several days of wastewater in the event of a significant plant failure. A diesel generator is on site in the event of a significant power outage.
Environmental Considerations	Consent	Obtaining ongoing resource consents could impact on disposal options. However, disposal techniques used; are current recommended practises therefore renewing resource consents is not anticipated to be a problem.
	Environmental Performance	The treatment system is robust and with the available storage capacity, breaches of the consent should only occur due to exceptional circumstances.
Extension	Other capabilities	The system has reserve capacity so additional connection to any part of the reticulation can be undertaken. When lower lying areas are developed, additional pumping stations will be required.

RESOURCE CONSENTS

Council's current resource consents are shown in the table below.

Table 8: Resource Consents

Consent No.	Source	Purpose	Conditions	Expiry Date
65081	Wastewater Treatment Plant – Discharges	Control discharge of treated wastewater from treatment plant	Quality Quantity	31-10-2032
67265	Disposal of Septage Waste	Control the process of treating septage waste	Control odour No runoff No adverse effects on environment	31-10-2032

SIGNIFICANT ADVERSE EFFECTS

Council is unaware of any significant adverse effects that the wastewater activity has on the social, economic, environmental or cultural well-being of the community. Based on groundwater test results taken from around the soakage site in accordance with consent conditions, current practices do not appear to be impacting on the natural underground water quality.

A potential negative effect of the Wastewater activity is the overflow of sewage due to pipe blockages. This would have environmental and potential health effects (i.e. environmental and social wellbeings).The adverse impact of blockages is minimised by very prompt attendance to blockages to reduce the instances and quantity of spillage, and subsequent disinfection of any contaminated area.

Potentially significant adverse effects would also occur if the treatment plant failed to operate for a period in excess of one day. This would negatively affect the community's health and the environment (social and environmental wellbeings).

SECTION FOUR

Risk Management

RISKS

Physical Risks

Physical risks are generally:

- As a result of the inevitable natural process of deterioration.
- Because of actions of other parties working or travelling in the vicinity of the assets.
- Because of natural disasters (most commonly earthquakes or flooding).

Durable materials, good workmanship, and careful planning will not always be sufficient to prevent physical damage by persons or natural disasters.

Volcanic eruption may produce ash. The ash will not affect the pipe network but may impact on the Rapid infiltration Basin soakage rates.

The Edgecumbe earthquake in 1987 caused no known damage to the wastewater network. This indicates that the current system has low risk from the more common natural disasters.

Financial Risks

Financial risks are those that result in decreased cash flow and/or inability to afford the works that are required.

They include loss of a major ratepayer (requiring the cost burden to be absorbed by the remaining ratepayers), failure to take advantage of any available subsidies and replacing assets before end of useful life, resulting in less than optimal life-cycle cost.

Depreciation for wastewater assets is being funded, therefore a depreciation reserve is available when renewals are required. Also loan(s) is available when the reserve funds are fully expended.

Health and Safety Risk

Health and safety risks arise as a result of physical actions or omissions of Council staff, contractors, or equipment failure. Health and safety risks are minimised by training staff and employing reputable contractors (SHE qualified) for maintenance and renewals.

Environmental Risk

There are environmental risks consequential to the operation of the wastewater network and/or physical actions or omissions of council staff or contractors. These risks are managed through compliance with resource consent conditions.

Regulatory Risk

The right of the BOP Regional Council to amend/update consent conditions during the term of consent represents a regulatory risk to Council. However, changes would normally only occur as a response to failure to meet existing consent conditions.

Any changes to consent conditions would usually be modified treatment practices, that could have capital and operational cost consequences. BOPRC would conduct significant dialogue with Council prior to actually amending conditions and there would normally be a timeframe within which to implement changes.

The special rights and status of Tangata Whenua in the resource consent process also represents a risk to Council. Council believes it can minimise this risk by maintaining an open and cordial relationship with local Iwi.

There is also a risk of prosecution if Council fails to comply with legislation.

RISK MITIGATION

Council actions taken to mitigate risks are set out in the table on the next page.

Insurance
Council has adequate insurance in place to cover the replacement and/or repair of buildings and other valuable assets in this group.

Civil defence and emergency response plans
Council has identified essential staff for recovering the water, wastewater and roading systems in the event of a civil defence disaster.

Table 9: Risk Table & Mitigations

Key Exposure	Class of Risk Probability	Residual Exposure Consequence	Mitigation
Physical			
Seismic Event	Medium	High	Earthquake design standards
			Spare capacity
			Special Insurance cover
Flood Event	Low	Low	Storage capacity at treatment plant
			Ongoing search for stormwater ingress
Damage by Others	High	Moderate	Staff available 24/7
Failure due to deterioration of assets	High	Low	Regular treatment plant maintenance
			Staff available 24/7
			Renewal Programme
			Spare capacity at treatment plant and pump stations
			Asset performance monitoring
Power interruption	High	Low	Standby generator available at treatment plant
			Spill basin can store incoming effluent under gravity flow for one day
			Pump stations small and alternative pumps available
Chemical non delivery	Moderate	Moderate	Material ordered before stock runs out.
			Significant storage on site
Financial			
New large consumer	Moderate	Low	Regular meetings with development agency
			Existing plant has 30% reserve capacity
			Developments take time allowing negotiations to take place
			Developments require Council consent
Loss of large consumer	Moderate	Low	Regular meetings with large industries
			Plant can operate on lower flows efficiently
Health and Safety			
Injury to persons or property due to operations	Low	Low	Health and safety practices in place
			Trained staff
			Insurance to cover costs
Sabotage	Low	Moderate	Plant security
			Robust plant
Injury to public	Low	Low	Access denied to treatment plant site
			Significant portion of asset underground
Environmental			
Overflow of wastewater due to pipe blockages or treatment plant failures	Moderate	Moderate	Staff available 24/7 to attend to blockages
			Treatment plant has storage capacity for one day's flow
			Plant has surplus capacity
			Monitoring plant performance
			Monitor blockages in pipework

SECTION FIVE

Future Needs

CURRENT CAPACITY

Network

The capacity of the network is adequate to handle general flows and any inflows from stormwater that may happen from time to time. Blockages in the network (1-2 per month) reduce capacity temporarily.

Pump Stations

All six pump stations have twin pumps (duty and standby). Each pump has capacity to handle flows even in heavy rain periods. Pump chambers have capacity to store several hours of effluent flow if both pumps are not operational.

Treatment plant

Council's wastewater treatment capacity is as follows:

- Primary screening – two screens – 10,000 population. An additional screen can be installed in the primary treatment plant to accommodate a further 5 000 population.
- Solids removal – two clarifiers – current capacity 10,000 population. An additional clarifier can be installed to handle a further 5,000 population if required.
- Solids Treatment – thickener and storage tank – both have the capacity to handle increased volumes to service a population of 15,000. The centrifuge has the capacity to run more hours, thereby having the capacity to manage a population of up to 15,000.
- Rapid Infiltration Basins – these have the capacity to process 4,000m^3 per day (estimated flow from a population of 15,000).

Consents

The worm farm can process solids generated by a population of 15,000 under existing conditions. The consent for the Waste Water Treatment plant and RIBs allows the processing of wastewater from a population of 15,000.

FUTURE DEMAND

Kawerau District has experienced and is expected to continue to experience low growth in demand for additional wastewater services.

There are a number of vacant residential sections in the town. Even if these sections were occupied, the existing wastewater network would cope with the additional demand.

The existing wastewater network has excess capacity enabling it to cope with any reasonable increased demand. A boundary adjustment was carried out in 2012 with the subsequent initial development of a new industrial park. Council constructed a service line to the new industrial park on SH34 in response to this and the new Waiū dairy factory came online with a consent to dispose of trade waste in June 2019. The trade waste consent allows Waiū dairy to discharge a total volume of 400m3/day with a concentration of 200g/m3 of solids. This is an equivalent volume usage of 1700 population from the Treatment Plant.

There remains some influence from stormwater getting into the wastewater network during very heavy rainfall. This is likely to be caused by inflow (unauthorised connections) rather than infiltration. Detecting the source and stopping the increase in flow is desirable. The treatment plant and pipes are able to manage the increased flows, but eliminating them will improve plant performance and slightly reduce costs.

Issues that have been identified as affecting capacity are:

- Removal of unauthorised stormwater connections to the wastewater network may reduce the total demand.
- Population growth or decrease will change demand; however, the current system can deal with much larger than expected population changes.
- Gradual deterioration of network due to ageing, that may increase infiltration and blockages, will require an increase in treatment volume. However, this is likely to be negligible when compared to current spare capacity.

TRENDS

Population growth

In the 2013 census, the total population of the Kawerau District was 6,363, a decrease of 8.1% or 561 people since the 2006 census. Despite the predicted further decline, the 2018 census showed a growth of general population to 7,460. The Kawerau district estimated population according to the 2023 census is 7,820 which represented a 4.8% increase in population since 2018 or around 1% population growth per annum.

Council hopes to bolster these gains with economic development initiatives, such as the development of a new industrial park and promotion of the natural environment.

As is the case with the rest of NZ, the population is aging with an increasing portion of the population receiving state funded superannuation and employment benefits. The average household income is expected to remain lower than the national average and there will be an increased requirement for external funding to renew the infrastructure in the future.

Table 10: Statistics NZ Population Projections – Kawerau District

Population Change 2006–2043 (NZ Stats)								
Projected Range	2006 *Census*	2013 *Census*	2018 *Census*	2023	2028	2033	2038	2043
High				8,110	8,410	8,650	8,830	8,970
Medium	6,921	6,363	7,460	7,910	8,000	8,020	7,970	7,860
Low				7,720	7,610	7,410	7,140	6,800

NEW CAPITAL REQUIREMENTS

There are no new significant capital requirements during the life of the plan. Council will replace existing assets only.

Any new land developments in the industrial park or any future residential development will result in additional wastewater infrastructure constructed by the developer and vested in Council or funded by the developer through Council's financial contributions policy.

SECTION SIX

Lifecycle Management

Service Connections

Service connections connect the domestic wastewater lines from residential properties and businesses to gravity reticulation pipes. Service connections may be Asbestos Cement (AC), glazed earthenware, Polyvinyl Chloride/Plastic (PVC), depending on when a property was developed. This pipe is generally the property owner's responsibility. Council's maintenance responsibility ends at the property boundary.

The service connections are typically 100mm pipes. The material is not recorded in Council's asset register, but it is assumed that those connected during the period from 1955 to 1996 are fibre cement or glazed earthenware and those connected post 2000 are PVC.

There is one trade waste connection from Waiū dairy factory with a limited consent to discharge to the Kawerau wastewater system.

Due to the minimal length of pipe that belongs to Council, having the incorrect material is not considered significant. However, as improved information becomes available the data will be updated. Currently the service connections are not recorded in AssetFinda.

Gravity Reticulation Pipes

The network pipes are typically between 100mm and 450mm in diameter. Most of the reticulation is in the range of 150mm to 200mm that collect effluent and feed them to trunk mains (300mm to 450mm).

Depending on location, the pipes are asbestos cement, concrete, concrete lined steel, PVC, PE or glazed earthenware. The asset register holds pipe material. The accuracy of the split of different material types will be improved over time as records of material types are collected during repair operations.

A large percentage of the network pipes were installed in the period 1955 to 1975. This is expected to give rise to a significant increase of renewals as the pipes reach the end of their effective lives.

Wet to dry weather flows is an indicator of the network's condition. A typical benchmark for systems in very good condition is three. The ratio is based on peak daily flows divided by the low average (monthly) flow.

An extreme wet weather event has been known to increase peak wastewater flows to 250m^3 per hour. A typical rainfall event results in an inflow of 180m^3 /hour. The average daily flow is around 85m^3/hour giving a ratio of 2.7. It is believed that most of this infiltration is due to illegal stormwater connections rather than pipe failures.

This assumption has been made because the flow increase occurs during the rainfall event and drops off quickly after the rain ceases which is different to groundwater infiltration that has a slow increase and slow drop off in flow.

The diameter profile and materials of all the reticulation is illustrated in the tables below:

Figure 5: Diameter Profile of Wastewater Pipes

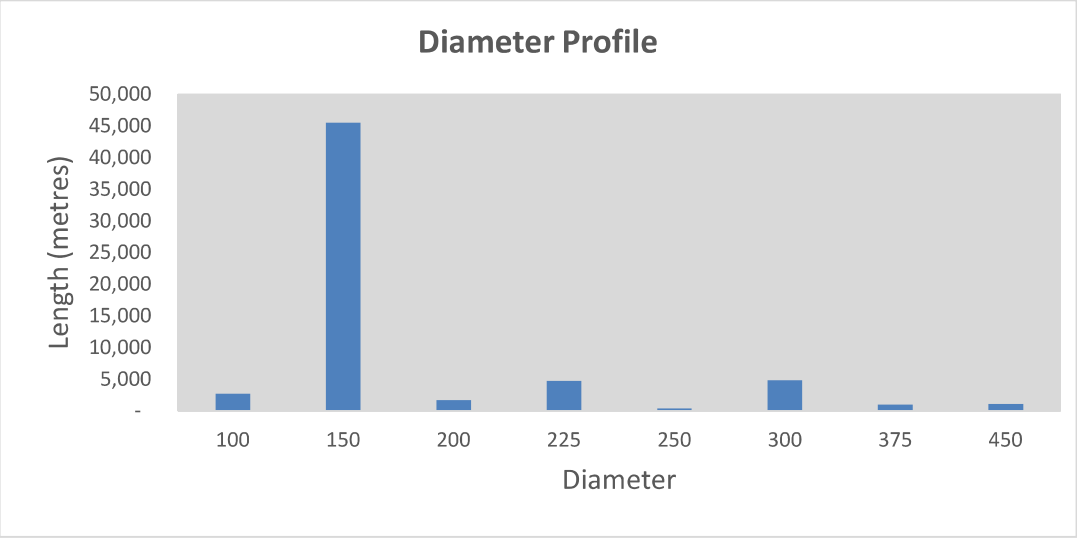
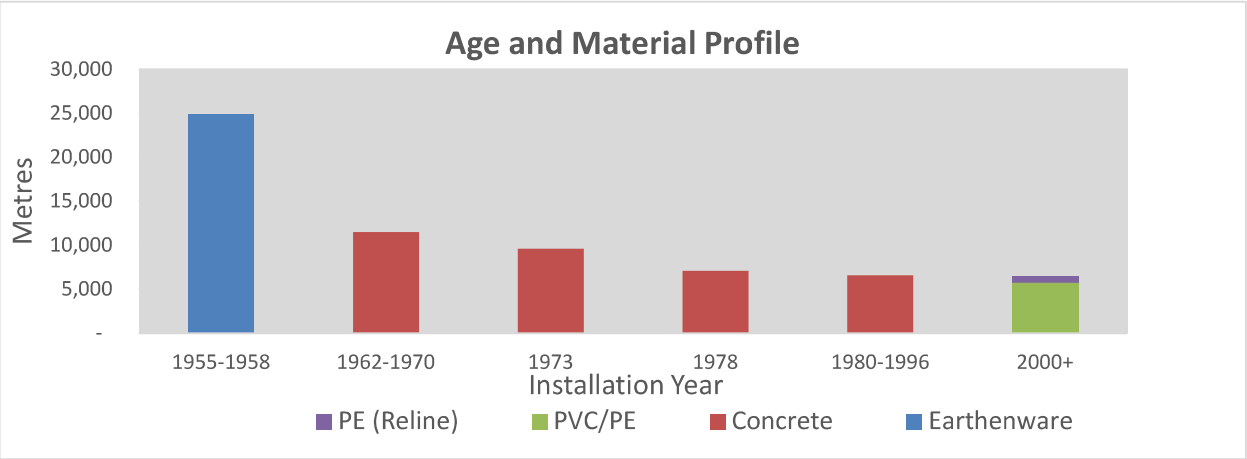


Figure 6: Age/Material Profile of Wastewater Pipes



The type of material used in the reticulation is based on the following assumptions:

Pipes installed at the time the town was constructed (1955 to 1962) were a mix of concrete and glazed earthenware

Pipes installed after 1962 and pre-1970 are concrete. This has been determined by random inspection of the pipes entering and exiting manholes.

Pipes installed from 1970 onwards were fibrolite, asbestos concrete or Supertite as manufactured in New Zealand by James Hardie & Co Ltd. Some concrete and concrete-lined steel pipes were also used in larger trunk mains.

The newer pipes (after 2000) are various types of PVC. This material has only been used in small quantities.

The installations since 2018 are PE or PE relining of pipes in the CBD.

Issues with asbestos concrete materials include softening due to age, ground conditions and to attack and corrosion by sewer gases (e.g. hydrogen sulphide). PVC is considered a long lasting material, however it is reasonably rigid, which could make it more susceptible to breakage during an earthquake.

Manholes

Manholes are used at changes in pipeline gradient, direction, diameter or at multiple service connections. They are also spaced in order to ensure easy access to the full length of the pipe. They are generally constructed of circular reinforced pre-cast concrete. The concrete bases have benching or faring from inlet pipe/s to outlet pipe to improve effluent flow.

Manhole lids, generally pre-cast reinforced concrete, span the manhole and provide support for the cast iron frames and circular cast iron access covers.

The most likely location for deterioration in manholes is at pipe entry and exits. Thus failures can be rectified or modified while the asset is in service. The system operates in an aerobic state therefore damage to the underside of the concrete manhole lids except in the geothermal area is not occurring

Pump Stations

There are six pump stations.

1. Pumps effluent from the Tarawera Park buildings to the gravity main in Cobham Drive.
2. Pumps effluent from the Firmin Field lodge to the gravity main in River Road.
3. Pump station located at Blundell Avenue and pumps the wastewater from approximately 80 houses in the Valley Road area to the gravity main in Marshall Street.
4. Pump station located at Fox's Marae which pumps wastewater from the Marae and adjoining residence. This property is currently outside the district boundary.
5. Pump station located at the new residential development off Porritt Drive.
6. Pump station located on the site of the Waiū Dairy factory in the newly developed Putauaki industrial land off SH34.

The pump stations are reinforced concrete construction and house twin pumps (duty and standby). The stations can also be pumped out using portable pumps or sucker trucks in the event of a significant failure.

Treatment Plant

The treatment plant is a single modern plant that removes solids from the wastewater. The solids (30 tonnes per week) are disposed of by vermiculture and the effluent (1,800 to 2,400 m^3 per day) discharged to the Rapid Infiltration Basins.

Council owns and operates the treatment plant that consists of several processes. The processes are as follows:

Primary Screening Process – The process uses three primary pumps, two aerators, two screened wastewater pumps, large concrete tanks and two 1 mm slot size contra sheer screens. The wastewater from the town is passed through 1 mm slot size contra sheer screens to remove the coarse litter. The screened effluent is then stored in a buffer basin and transferred to the solids removal part of the plant at a constant rate. The coarse litter is disposed of through landfilling.

Solids Removal Process – The process uses four stainless vessels, chemical mixing equipment, four peristaltic pumps, centrifuge, and monitoring equipment. The screened effluent is dosed with both alum and a polymer. On passing through the clarifiers (two of the stainless vessels) the solids coagulate and settle.

The solids are then transferred to the other stainless vessels where they thicken and surplus water is decanted. The final thickened solids are processed through a centrifuge where the water content of the solids is lowered to approximately 20%. The solids are then transported to a worm farm where they are digested over 18 months into a usable soil conditioner.

Liquid Disposal Process – The process uses two pumps, a drain tank, 2km of 300mm HDPE pipe, 100mm soaker hoses and rapid infiltration basins. The clear liquid from clarifiers is pumped to rapid infiltration basins (RIBs).

The effluent is spread over the surface of the RIBs and soaks into the porous ground. As the water percolates to the ground water table any remaining solids are removed and also any remaining bacteria are destroyed (the soil acts as a purifier as the liquid percolates through it).

The significant components of the treatment plant; concrete tanks, buildings, stainless steel vessels, stainless steel pipes are made of made of durable material and will remain operational for many years.

The pumps, electrical connections, software and centrifuge will require maintenance and replacement in accordance with standard replacement and maintenance practices.

CRITICAL ASSETS

Asset criticality is the relative risk of a high cost arising from failure of that asset. Criticality is determined by the cost and risk of potential; failures and the relative importance on society and the environment. Evaluating the different failure modes of critical assets determines what maintenance, capital expenditure and conditioning monitoring needs to be planned.

In general, critical assets are maintained on risk management principles, whereas non-critical assets are maintained reactively (replace on fail).

Of the assets described in section 6.1, the following lists those that are critical:

The section of gravity reticulation pipes and manholes between the wastewater treatment plant and State Highway 34

The wastewater treatment plant

Blundell Avenue pump station.

ASSET DATA

Material Type

Field inspections have been undertaken to determine if pipes are AC or Concrete. The town has been built in phases and the earlier constructions were concrete and then AC. The later developments/renewals have used PVC and then PE. The inspection and install date data have been used to determine with a reasonable level of accuracy the types of material installed.

Getting the types of material wrong is of significance if the life of Concrete and AC are significantly different. While it is impossible to guarantee that every pipe in AssetFinda has the correct material type it is considered that the material type would have 90% accuracy.

Pipe Diameter

The pipe diameters in AssetFinda have been taken from the existing as built plans. Various cross checks have been undertaken to visually asses for glaring errors in the location of pipe diameters and there is considered to be a high level of confidence that the diameter in AssetFinda match those in the ground. It is estimated that the size of pipes in AssetFinda are in excess of 95% accurate.

Asset Locations

The physical location of the manholes has been validated by viewing the as built plans and looking to see if the location in AssetFinda appears to be correct in terms of boundaries.

Incorrect location of a manhole has very limited impact on the quantity of assets (it may impact on field staff locating the asset in the future but the physical location will be within meters of the AssetFinda location).

Significant impact only occurs where the diameter of pipes are inaccurate, thereby creating a financial impact on total asset values.

AssetFinda does not hold all the household connections information, therefore an arbitrary figure for the length of service lines has been assumed.

Overall it is considered that the accuracy of wastewater data is approximately 90% for location, quantity and materials. Management will be undertaking an exercise in the near future to improve the quality of information for wastewater assets

MAINTENANCE PLAN

General

Overall, the wastewater network is in a good state of repair. If it is maintained and renewed regularly and at the appropriate times, the existing levels of service can continue indefinitely.

Council intends to operate, maintain and renew the wastewater network on an ongoing basis so that it continues to provide the desired level of service required in the future.

Wastewater maintenance involves pump maintenance, electrical equipment servicing, videoing sewer lines and preventative clearing of sewer lines. A low level of equipment breakdown indicates that the correct level of maintenance is currently being undertaken.

A schedule of duties is performed daily, weekly, monthly or on an “as required” basis for various parts of the network. The duties include taking and recording plant performance measurements, maintenance undertaken and changes in operating practices. All maintenance, preventative maintenance and repairs are undertaken to a high standard.

Service Connections

Installation of new service connections into Council mains is undertaken to a high standard. Inspection of the connection occurs before the connection is covered. Blockages in the sewer line from the house to the main sewer can be either the responsibility of the owner or Council depending on whether the blockage is before or after the boundary of the property.

Local plumbers are familiar with who is responsible and few disputes take place. Plumbers contact Council early in the process if they believe that the blockage may be a Council responsibility.

Pipes

Maintenance is a mixture of reactive and preventative actions. Blockages and breaks are repaired when reported and a log of faults is maintained. Preventative maintenance is carried out as follows:

- Inspection of some known trouble spots using Close Circuit Television (CCTV).
- Water blasting of problem fat build-up areas.
- Removal of trees that are known to cause repeat blockages.
- Repair of pipes with poor connections that are detected during CCTV inspections.

The network averages 0.5 to 1.0 blockages per month (6 - 10 per year). They are the result of fat build-up, roots or other foreign material in the pipes, with none due to pipe failures. There are approximately 62 km of pipes giving a blockage rate of 10 to 16 per 100km per year. Other networks report blockage rates of 30 per 100km per year. The Kawerau rate is lower than average due to the network being newer and the pipes being in good condition.

Manholes

Manhole maintenance involves re-plastering the invert, replacing rungs, replacing broken lids, raising lid levels and ensuring manholes in private sections are accessible.

Pump Stations

Pump blockages and breakdowns are repaired when they occur. Pump stations are checked daily to ensure they are working and pumps are lifted and serviced when performance declines.

Treatment Plant

Plant flows, wastewater quality and quantity are monitored continuously as it enters and leaves the treatment plant. Numerous plant checks are conducted daily to monitor plant performance and regular cleaning of the plant is undertaken. Pumps, valves, controls, mechanical devices and gas protection devices are maintained in accordance with manufacturer’s recommendations. Many of

the pumps run continuously. For those areas where there are standby pumps they alternate weekly as the duty pump.

This ensures all pumps are working and because they have been replaced at various times previously, ongoing replacement is spread over a number of years.

Rapid Infiltration Basins

The basins are used on a rotation basis to ensure the ground is not saturated, which would negate the soils ability to sterilise the wastewater. Any solids in the wastewater left on the surface of the RIB are dried then removed. Mowing of some areas around the RIBs is undertaken for aesthetic reasons. Ground water is monitored to determine if there is any contamination due to the RIB operation.

Worm Farm

The solid material from the centrifuge is placed in windrows and covered immediately with wood fibre or sawdust to prevent odour. The worms eat the solids as it decomposes. The eating process removes harmful bacteria and converts the waste to a useable product: vermicompost. Once the vermicomposting has been completed, the vermicompost is taken off site for disposal or use as a soil conditioner for pasture or forests.

RENEWAL / REPLACEMENT

The network has been divided into six zones based on the estimated average date of development. Pipes and valves have a 70 - 80 year estimated life apart from the geothermal zone where the life is 40 years. Each zone is given the same installation date and the same replacement date.

Renewal/replacement funding for each zone is mostly averaged over ten years. This allows for the spread of installation dates and different rates of deterioration due to installation methods, material quality, water quality and tree roots.

Replacement decisions are based on information including the condition, reliability and maintenance cost of the asset as well as age. Council's objective is to maximise asset life without compromising service. Extending the asset life reduces the overall cost to the community and in sections of the network where the consequences of failure are minimal, the best strategy is to make sure replacement material is readily available and run the pipes to failure.

Reticulation

Concrete

The oldest of the pipes are approaching 67 years old (installed in 1957). There have been no collapses of wastewater pipe in Kawerau except in areas that are impacted by geothermal activity (Town Centre).

A section of 225mm concrete sewer pipe was removed in 2015 and tested in the Opus Lab in Christchurch. The pipe was assessed as Grade 3 - Moderate Condition. The pipe was assessed as having a further 40 years of life.

The section through the pipe that shows the level of cement that has leached from the pipe showed the following

External deterioration	0.0 to 2.6mm
Internal Deterioration	0.8 to 10.3mm

The above test result, visual observations and lack of collapses in concrete sewer pipes confirms that there is still reasonable life remaining in most of these pipes. However, the total life of the pipes has conservatively been estimated to be 70 to 80 years. But, if the pipes are still in good condition when the renewals are programmed, the remaining life will be reassessed at that time.

Visual inspections of sewer manholes that are all concrete (except those impacted by geothermal) show little sign of deterioration.

Similarly, manholes lives have conservatively been estimated to be 70 years. But, if they are still in good condition when the renewals are programmed, the remaining life will be reassessed at that time.

Asbestos Cement

Extensive testing of AC water mains has been undertaken and these show an increased level of leaching of the cement from the exterior of the pipe than that shown in the concrete sewer pipe tested. Because of the increased deterioration of the exterior of the pipe it is assumed that the sewage will have had an increased impact on the invert of the interior portion of the pipe compared to the concrete pipe as well.

There have been no collapses in the AC sewage lines. However AC was not used until around 1973 meaning that existing lines are only at most 51 years old.

Based on this information the lives for AC pipes are estimated to be 70years.

Glazed Earthenware

The Glazed Earthenware is located mostly in the geothermal area. It was installed around 1957. The pipes in the geothermal area showed signs of deterioration and have been relined with PE pipe 2017 – 2024 and those

pipes are determined to have a 40 year life due to the harsh environment.

While visual inspection of earthenware pipe in other areas shows little sign of deterioration so the life of these assets has been conservatively estimated to be 70 years.

Plastics (HDPE, PVC, UPVC)

These pipes have been installed from 2000 on so there is no local experience on expected life from deterioration.

Lives used by other Council as to the expected life varies considerably. A report received from Project Max on installing a new pipe has advised that a structural design life of 50 years But their experience suggests Council can conservatively adopt an expected life of 80 years.

Pump Stations

Pumps at the stations are rebuilt or replaced when they fail. A decision on rebuilding versus replacing is made on purely economic grounds.

Treatment Plant

The treatment plant is relatively new and built largely of stainless steel so no significant component replacement is anticipated during the life of the 10 year plan. Components (pumps, electrical sensors, etc.) will be replaced as they fail or/and in accordance with manufacturer's recommendations.

NEW ASSETS

The resource consent for the wastewater treatment plant expires in 2032. The treatment process is currently not impacting on the environment and provided legislation relating to water quality discharges doesn't change significantly between now and 2032, significant changes in the outputs from the treatment plant are not anticipated. Upgrading of the plant is therefore not anticipated during the life of the plan.

Deferred Maintenance

Currently there is no known deferred maintenance with the water supply network and the full service potential of the asset is being maintained. Council policy is to avoid any deferred maintenance.

Disposal Plan

There are no specific disposals identified in the plan. Pipes that are no longer required or are replaced due to failure will not be retrieved as they have no value. Normally, old pipes will be replaced by new pipes in the same location. If pipes are not replaced, they will be made safe in situ.

SECTION SEVEN

Financial Forecasts

FUTURE REQUIREMENTS

Table 11: Estimated Financial Requirements (Including Inflation)

	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
Expenditure									
Personnel costs	260,043	268,490	275,973	283,221	289,981	296,266	302,554	308,599	314,404
Materials	424,489	445,325	465,532	485,209	506,223	520,031	534,925	547,614	559,920
Internal charges	690,910	718,050	750,740	790,850	827,450	873,850	922,710	975,460	1,041,050
Maintenance	168,730	125,570	162,780	137,840	176,050	148,510	186,300	156,710	194,430
Overheads	343,650	352,830	368,610	379,610	415,270	409,760	440,450	459,600	471,670
Depreciation	672,550	672,668	745,102	745,239	745,376	813,208	813,359	813,510	876,204
	2,560,372	**2,582,933**	**2,768,737**	**2,821,969**	**2,960,350**	**3,061,625**	**3,200,298**	**3,261,493**	**3,457,678**
Asset renewals	1,742,400	1,963,070	1,797,540	1,371,260	1,623,290	1,318,670	1,369,010	1,432,700	1,550,740
Total	**4,302,772**	**4,546,003**	**4,566,277**	**4,193,229**	**4,583,640**	**4,380,295**	**4,569,308**	**4,694,193**	**5,008,418**

Table 12: Estimated Asset Renewals (In todays $)

	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
Expenditure									
Pipes	855,957	855,957	855,957	855,957	855,957	855,957	855,957	855,957	944,719
Laterals	0	0	0	0	0	0	0	0	0
Manholes	169,360	169,360	169,360	169,360	169,360	169,360	169,360	169,360	169,360
Pumping Station	61,800	56,800	0	0	0	11,600	0	0	17,200
Treatment Plant	528,350	646,750	512,350	114,150	284,600	0	23,400	45,300	0
	1,615,467	**1,728,867**	**1,537,667**	**1,139,467**	**1,309,917**	**1,036,917**	**1,048,717**	**1,070,617**	**1,131,279**

FUNDING POLICY

The Revenue and Financing Policy sets out how Council's activities are funded. This policy has been developed to meet the requirements of the Local Government Act (LGA) 2002.

Council has broken its business down to activity level. In general, Council has assessed the availability of an activity as a public benefit and the use of an activity as a private benefit, although has not tried to determine the exact costs of availability and use.

'Availability' relates to the costs incurred to keep a service or asset in such a condition that it can become operational within a short start-up period (e.g. maintaining the water network even if it wasn't used, renewing assets).

'Use' relates to costs incurred as a result of the asset being used (e.g. chemicals and electricity).

Distribution of Benefits

The wastewater network is a benefit to the district as a whole as well as users that are connected to the service. The costs of having the network available is a public good and recoverable from all ratepayers through the general rate. The estimated "use" cost is recovered from those connected to the network through a targeted rate.

When Benefits Accrue

Council has identified a substantial intergenerational component (i.e. benefits arise over time). The wastewater infrastructure has a long life, so more than the current generation of ratepayers benefit.

Therefore, Council wishes to ensure that future ratepayers meet some of the cost. This is achieved by funding depreciation over the life of the assets.

Funding Sources

Wastewater is funded from general rates 75% and a targeted rate to properties connected to the network 25%

As the depreciation reserves grow, increased interest revenue from the investment of these reserves lowers the amount of depreciation funding that is required from rates. Inflation figures are provided by BERL, and used to determine the revaluation of the asset figures on a three-yearly cycle.

The mix of a targeted rate and the general rate is considered to reflect both the benefits to individuals that have an efficient and healthy collection and disposal system, and the community, which benefits from effluent being disposed of in a sanitary manner, with associated health benefits, by a system available for all properties to connect.

VALUATION

The wastewater network infrastructure is valued by an experienced valuer on a three yearly valuation cycle. Assets are valued at fair value determined on a depreciated replacement cost basis. The most recent valuation is effective as at 30 June 2022.

Asset basis of valuation

Valuation of wastewater assets are done on the following basis:

Table 13: Valuation Basis – Water Assets

Asset Type	Valuation Basis
Land	Market value
Buildings	DRC
Plant	ODRC
Reticulation	ODRC

The Depreciated Replacement Cost (DRC) refers to today's cost of replacing the asset with the same or a similar asset and depreciated over the life of the asset.

The Optimised Depreciated Replacement Cost (ODRC) refers to today's cost of replacing the asset with another asset that provides the same level of service most efficiently and depreciated over the life of the asset to reflect its current value and remaining economic life.

The optimised replacement cost assigned to each asset has been determined by suitably qualified and experienced professional persons and has been peer reviewed.

Expenses

Maintenance costs and operating costs are expensed in the year they are accrued. The capitalisation threshold for wastewater assets has been set at $1,000 or the actual value of individual components where they are identified by AssetFinda.

Changes in asset valuation

The costs associated with renewing assets and providing new or improved asset infrastructure are capitalised and depreciated in accordance with the assessed economic life

of each asset. This applies also where a developer provides infrastructure to be taken over as public assets by Council.

Capitalisation Threshold

The following definitions are used for asset management purposes and the financial treatment is summarised below:

Maintenance is work done that is of an operational nature that can contribute to the asset life reaching its maximum potential but neither increases the value nor extends the remaining life of any asset. However, maintenance may enable the asset to perform at a higher level of service for a longer period of time and/or ensure that the maximum life of the asset is attained.

Renewal is work done to replace an existing asset. The cost of replacement must be recorded as a capital expenditure, be greater than $1,000 and recorded in the asset register as a new asset with a unique identifier.

If the asset replaced is discarded or sold it must be removed from the asset register and any residual value must be formally written off.

An addition to the asset register is required when a new asset is created with a value exceeding $1,000. A new asset must be uniquely identified, and recorded in the asset register. The record in the asset register requires an assessment of the asset's remaining life expectancy (based on straight-line depreciation or estimated remaining life).

Where the asset register recognises an individual component worth less than $1,000, or where a length of pipe greater than 12 metres is replaced, the threshold does not apply and the additional value is capitalised.

KEY ASSUMPTIONS

The current valuation and renewal profiles are based on data currently available.

Asset condition

In the case of wastewater pipelines, the condition is taken as being directly related to age, unless better information is available. The testing of samples from repairs on pipes that are approaching the end of their useful life provides additional information. While a more planned inspection would provide a more direct assessment of condition, the cost of such programmes is high.

Replacement cost

The projected replacement costs and depreciated values shown in **Table** have been derived from Council's asset register. Further work identified in the improvement plan, will be carried out to verify the condition of the assets and the potential need for future replacement.

Council's practice for calculating pipeline replacement costs is:

- All pipeline replacement would be carried out using PE pipe.
- The construction environment is brown field (replacement of existing rather than green field construction).
- Unit rates for replacement are derived from latest valuation (with allowance for inflation) as undertaken by professional valuer.
- Replacement of pipes includes: valves, fittings, and house connections. Unusual pipe sizes will be replaced with the next size up.
- No optimisation or efficiencies in pipe size or lengths have been allowed for in replacement costs

Depreciated value and life expectancy

Straight line depreciation has been adopted for all above ground assets. The life expectancies shown in **Table** were used to calculate depreciated values.

The town centre area of Kawerau has geothermal activity. The heat and chemicals present significantly shorten the fibre cement pipe life in this area. Pipes in the geothermal area have an estimated life half that of similar assets in other areas.

It is accepted that the above approach requires improvement, because for some assets, the actual need for replacement is out of step with the theoretical depreciation. The improvement plan includes steps to make the valuation and renewal projections more robust.

Population

Further sustained decline in population as predicted by Statistics NZ may seriously erode the rating base of the district, placing a higher burden on the remaining residents for any infrastructure upgrades and possibly affecting capacity to fund renewal works. Population trends must therefore be reviewed as frequently as reliable data can be obtained.

Other assumptions

All expenditure is stated in 2022 values, with allowance made for the inflation over the planning period.

All costs are GST exclusive.

Operational costs are generally shown to increase in relation to inflation.

Renewal costs are based on anticipated replacement requirements.

The costs of insurance and risk mitigation are included in the forecasts.

Climatic and other environmental trends are expected to continue as they have in the recent past.

The plan provides scope for some growth in industrial/commercial demand.

Development Contributions

Section 106 of the Local Government Act 2002 requires local authorities to adopt development contributions or financial contributions policies.

Spare capacity in Council's infrastructure means it can cope with growth. Therefore, Council does not need to extend infrastructure to cope with increasing demand.

Council has resolved not to assess development contributions but to retain the provisions of the district plan that allow the assessment of financial contributions.

Financial Contributions

New subdivisions or developments may require the extension of council infrastructure networks for water supply, wastewater disposal, stormwater and roading. Council's financial contributions policy provides that the cost of these extensions is the responsibility of those who create the demand.

Subdividers and developers may be required to make financial contributions to meet the full cost of additional infrastructure necessary to support their subdivision or development.

Table 4: Replacement Costs and Depreciated Values (@30 June 2022)

Asset Type	Gross Replacement	Depreciated Replacement Cost
Pipelines	$22,882,400	$6,188,090
Laterals	$881,500	$392,300
Manholes	$3,410,640	$785,570
Pumping Station	$567,970	$424,720
Screening	$2,679,630	$1,914,880
Treatment Plant	$7,223,090	$4,108,400
TOTAL	**$37,644,700**	**$13,813,960**

Table 5: Asset life expectancies

Asset Type	Life Expectancy
Buildings	80 years
Pumps, controls	25 years
Pipes – PVC & PE	80 years
Pipes – Concrete, AC & Glazed Earthenware	70 years
Pipes (geothermal area)	40 years
Manholes	70 years

SECTION EIGHT

Asset Management Systems & Processes

Responsibilities for Asset Management Outcomes

The Engineering Manager is responsible for the development of this asset management plan, including maintaining the integrity of Council's asset information.

The Engineering Manager is also responsible for the identification, budgeting, planning, programming and undertaking of works required for the maintenance and renewal of Council's wastewater assets.

The Group Manager, Finance & Corporate Services is responsible for providing an overview of the development of this asset management plan, for ensuring that future projects are incorporated in Council's Long Term Plan, Infrastructure Strategy and that there is consistency between these documents.

The Group Manager, Operations and Services is responsible for delivering the outcomes for the wastewater activity. This includes ensuring that the assets are maintained and operated to Council's requirements, that adequate budgets for maintenance, operating and improvement costs are provided.

Accounting and Asset Management Systems

Billing/Accounting system

Council uses the Ozone software for its accounting and billing systems. It does not store or compute asset management information, but can be used to determine the number of connections to the wastewater and the number of properties billed for separate wastewater rates.

Currently, all formal asset management financial reporting including valuation is held in Excel spreadsheets.

This information will be migrated into the AssetFinda system in the near future.

AssetFinda

AssetFinda is the software used to manage and produce asset inventory reports. It is integrated with 'Map Info' data tables to permit input, querying, reporting and financial modelling using the asset register data. The spatial location of the wastewater assets can be laid over aerial maps, property boundaries, along with water and stormwater assets.

The software has yet to have financial data added to allow financial modelling for current replacement and depreciation value reporting.

New asset information (location, installation date, materials' construction etc.) is entered into AssetFinda at the time the asset is installed.

The default valuation process used by AssetFinda is capable of recognising asset condition, extending the life of an asset and recalculating revised depreciation value and annual depreciation.

The improvement plan proposes that the appropriate financial information be entered into AssetFinda.

Hard copy plans

Layout details of the pipes and structures are available for most of the wastewater asset.

Attaching information like pump performance, type etc. to assets is a desirable improvement. Also linking photographs and 'as built' drawing to the asset will improve the data.

Key Information Flows and Processes

Key information flows and process linkages include:

Translating the Community Outcomes into detailed levels of service that can be embodied into Asset Management Plans

Preparation of annual budgets, and ongoing reporting

Updating asset data as information becomes available through maintenance and service repairs

Ongoing compliance monitoring and reporting of environmental performance

Ongoing management of the asset to ensure that service levels are maintained

Quality management

Management is governed by the requirements of the treatment plant consent. Programmed sampling of wastewater is undertaken at the treatment plant by electronic equipment and verified by manual sampling.

Sampling of the groundwater determines if there is any impact on groundwater quality from treated wastewater being discharged to the RIBs. The testing programme provides assurance that the treatment process is satisfactory and results are submitted to the BOPRC in accordance with resource consent requirements.

Maintenance

Maintenance is carried out reactively for most asset faults. The criteria resulting in renewal rather than further maintenance are:

Is the asset important for maintaining service levels and have the service levels in the current year already been compromised by failures? If yes consider renewal.

What has been the failure history? If the current failure is part of a series, then consider renewal.

Is the cost of the maintenance comparable to the cost of renewal? Where repair costs are high then consider renewing a logical minimum quantity of asset to prevent further expensive repair costs.

Will maintenance preserve asset life? If yes, then carry out maintenance.

Policies for renewing assets

Replacing network components with larger components to improve capacity is treated purely as renewal capital expenditure. This is because the additional cost of larger components is not material compared with the renewal cost of component of the same kind. Renewal of assets will occur in accordance with practice described earlier in document.

Constructing new assets

Following many years of no demand for additional capacity, recent land developments for industry and residents have resulted in the need for additional new assets. Although this did not require the need for additional capacity, future funding to provide additional capacity would be treated on its merits. In most cases the funding would be sought from the developers/subdividers.

Assets vested in Council

Subdivisions include wastewater networks. These are installed at subdivider's expense to approved Council standards and then vested in Council.

'As built' new works either occurs due to subdivisions, or the installation of new assets. In both instances, detailed records of new works are obtained. These new assets are added to the AssetFinda database.

Asset disposal

Most of the components are essential to continuing provision of the service. Extensive decommissioning and disposal is unlikely.

SECTION NINE

Monitoring Improvement Planning

Asset Management Performance Measures

The broad objectives of asset management are:

- To optimise the life of the assets
- To minimise life cycle costs
- To maintain agreed levels of service

Although it is possible to measure the success or otherwise of the asset management activity over the long term against the three criteria above, it will obviously be difficult to measure success or otherwise in the short term in a way that management control can be exerted. For example, it will be impossible to determine whether the life of a facility has been "optimised" until the actual age nears the expected life and a remaining life assessment can be meaningfully carried out.

An assessment of the asset knowledge and processes currently carried out, in terms of "best practice for a NZ authority of this size" provides an indication of how well Council is likely to be meeting these long term objectives. This assessment is therefore part of the Improvement Plan. It should include evaluation of the monitoring of operations and costs to provide information on the achievement of service level (both public measures and technical standards). It should cover previously-planned improvement actions, noting whether these have been achieved and how they are contributing to current processes. It should check how the initiatives undertaken are 'rolled out' from asset management staff to those carrying out the work, and how carefully field information is recorded and returned to add to the asset knowledge case.

Improvement Actions

Table 16: Improvement Actions

Improvement Item	Comment	By When	By Whom	Cost
Expand knowledge of AssetFinda functionality	Training staff (EM & 3 Waters Engineer)	Ongoing improvement	GMOS	$5,000
Maintain AssetFinda database	Three Waters Engineer recruited and being trained	Annually	EM Consultants	$20,000
Review asset life expectancy	Test pipes and manholes for deterioration	June 2025 and triennially thereafter	EM	$10,000
Conduct asset revaluations	Up to date	June 2025 and annually thereafter	GMFCS	$10,000

EM = Engineering Manager

GMOS = Group Manager Operations and Services

GMFCS = Group Manager Finance and Corporate Services

Monitoring and Review Procedures

The Group Manager Operations and Services will monitor and review improvement items on a six monthly basis. This plan will be reviewed annually as part of annual plan development.

SECTION TEN
Appendices

APPENDIX A - DETAILED ASSET DESCRIPTION

ASSET Pipes	DESCRIPTION	MATERIAL	QTY	YEAR
WASTEWATER PIPES - ZONE 6	300	PVC	106	2009
WASTEWATER PIPES - ZONE 6	300	PVC	95	2018
WASTEWATER PIPES - ZONE 6	300	PVC	988	2018
WASTEWATER PIPES - ZONE 6	225	PVC	44	2019
WASTEWATER PIPES - ZONE 6	150	PVC	75	2006
WASTEWATER PIPES - ZONE 1	450	CONCRETE/EARTHENWARE	1107	1956
WASTEWATER PIPES - ZONE 1	375	CONCRETE/EARTHENWARE	1000	1956
WASTEWATER PIPES - ZONE 1	300	CONCRETE/EARTHENWARE	2726	1956
WASTEWATER PIPES - ZONE 1	225	CONCRETE/EARTHENWARE	1787	1956
WASTEWATER PIPES - ZONE 1	150	CONCRETE/EARTHENWARE	14698	1956
WASTEWATER PIPES - ZONE 1	150	PVC	86	2017
WASTEWATER PIPES - ZONE 1	150	PVC	184	2018
WASTEWATER PIPES - ZONE 1	150	PVC	14	2019
WASTEWATER PIPES - ZONE 1	150	PE	220	2021
WASTEWATER PIPES - ZONE 1	150	PE	2470	2022
WASTEWATER PIPES - ZONE 6	150	PE	353	2023
WASTEWATER PIPES - ZONE 6	225	PE	235	2023
WASTEWATER PIPES - ZONE 6	300	PE	120	2023
WASTEWATER PIPES - ZONE 6	150	PE	429	2024
WASTEWATER PIPES - ZONE 6	225	PE	236	2024
WASTEWATER PIPES - ZONE 6	300	PE	62	2024
WASTEWATER PIPES - ZONE 6	150	PVC	90	2007
WASTEWATER PIPES - ZONE 2	225	CONCRETE	420	1965
WASTEWATER PIPES - ZONE 2	150	CONCRETE	8369	1965
WASTEWATER PIPES - ZONE 3	300	CONCRETE	497	1973
WASTEWATER PIPES - ZONE 3	225	CONCRETE	1788	1973
WASTEWATER PIPES - ZONE 3	200	CONCRETE	603	1973
WASTEWATER PIPES - ZONE 3	150	CONCRETE	6706	1973
WASTEWATER PIPES - ZONE 4	200	CONCRETE	781	1978
WASTEWATER PIPES - ZONE 4	150	CONCRETE	6318	1978
WASTEWATER PIPES - ZONE 5	300	CONCRETE	295	1985
WASTEWATER PIPES - ZONE 5	250	CONCRETE	443	1985
WASTEWATER PIPES - ZONE 5	225	CONCRETE	325	1985
WASTEWATER PIPES - ZONE 5	200	CONCRETE	365	1985
WASTEWATER PIPES - ZONE 5	150	CONCRETE	5167	1985
Piripiri / Tiwhatiwha Cres	150	PE	643	2020
Laterals - District Wide	100	Concrete	2717	1966
Laterals - New	100	PE	25	2021
Manhole		Concrete	253	1957
Manhole		Concrete	95	1965
Manhole		Concrete	150	1973
Manhole		Concrete	112	1978
Manhole		Concrete	113	1985
Manhole		Concrete	3	1996
Manhole		Concrete	10	2005
Manhole		Concrete	6	2008
Manhole		Concrete	1	2016
Manhole		Concrete	1	2017
Manhole	Piripiri / Tiwhatiwha Cres	Concrete	18	2020
Manhole	CBD	PE Lined	10	2024
Flushing tank		Concrete	3	1965
Flushing tank		Concrete	1	1985
Cleaning Eye		Concrete	6	1973
Lamphole		Concrete	11	1957

ASSET Pumping Stations	DESCRIPTION	MATERIAL	QTY	YEAR
Blundell Ave	CONTROLS	ELECTRICAL	1	1975
Blundell Ave	PUMPS	SUBMERSIBLE	2	2014
Blundell Ave	TELEMETRY	ELECTRICAL	1	1998
Blundell Ave	PUMP STRUCTURE - WET WELL	REINFORCED CONCRETE	2	1975
Tarawera Park	PUMPS	SUBMERSIBLE	3	1980
Tarawera Park	PUMPS	SUBMERSIBLE	1	2012
Tarawera Park	PUMPS	SUBMERSIBLE	2	2019
Tarawera Park	CONTROLS/TELEMETERY	ELECTRICAL	1	1980
Tarawera Park	CONTROL SHED	STEEL	1	1981
Tarawera Park	WET WELL	REINFORCED CONCRETE	4	1980
Tarawera Park	WET WELL - NEW PUMPS	REINFORCED CONCRETE	1	2016
Fox's Marae	WET WELL	REINFORCED CONCRETE	1	1998
Fox's Marae	CONTROLS	ELECTRICAL	1	1998
Fox's Marae	PUMPS	SUBMERSIBLE	2	2024
Firmin Lodge	WET WELL	REINFORCED CONCRETE	1	2015
Firmin Lodge	CONTROLS/TELEMETERY	ELECTRICAL	1	2015
Firmin Lodge	PUMPS	SUBMERSIBLE	2	2015
Waiū Dairy	WET WELL	REINFORCED CONCRETE	1	2020
Waiū Dairy	CONTROLS/TELEMETERY	ELECTRICAL	1	2020
Waiū Dairy	PUMPS	SUBMERSIBLE	2	2020
Waiū Dairy	TRADEWASTE CONTROL METER	ELECTRICAL	1	2020
Piripiri Cres–Retirement Village	PUMPS	SUBMERSIBLE	2	2021
Piripiri Cres	WET WELL	REINFORCED CONCRETE	1	2021
Piripiri Cres	CONTROLS/TELEMETERY	ELECTRICAL	1	2021

ASSET Treatment Plant Spencer Ave	DESCRIPTION	MATERIAL	QTY	YEAR
WASTEWATER PROCESSING	CONTROLS	ELECTRICAL	1	1988
WASTEWATER PROCESSING	CONTROLS - ADDITIONS	ELECTRICAL	1	2018
WASTEWATER PROCESSING	PUMPEX PX3-150 VORTEX (RAW WATER)	MECHANICAL	3	2013
WASTEWATER PROCESSING	PUMPEX PX3-100 (SCREEN WATER)	MECHANICAL	2	2019
WASTEWATER PROCESSING	TSURUMI TOS - 55 BER 2 SUBMERSIBLE EJECTORS	MECHANICAL	3	2018
WASTEWATER PROCESSING	CONTRA SHEAR 15/12 MILLISCREENS	MECHANICAL	2	2000
WASTEWATER PROCESSING	MILLISCREEN CONTROLS	ELECTRICAL	2	1988
WASTEWATER PROCESSING	PIPEWORK	STEEL	1	1988
WASTEWATER PROCESSING	STRUCTURE - SEWAGE PUMP STATION SUMP	REINFORCED CONCRETE	1	1988
WASTEWATER PROCESSING	SUMP VALVE CHAMBER	REINFORCED CONCRETE	1	1988
WASTEWATER PROCESSING	MILLISCREEN BUILDING	BUILDING	1	1988

WASTEWATER PROCESSING	SCREENED SEWAGE BUFFER TANK	REINFORCED CONCRETE	1	1988
WASTEWATER PROCESSING	TRANSFER PUMP SUMP	REINFORCED CONCRETE	1	1988
WASTEWATER PROCESSING	TPS VALVE CHAMBER	REINFORCED CONCRETE	1	1988
WASTEWATER PROCESSING	RAW PIT CHAMBER	REINFORCED CONCRETE	1	2024
WASTEWATER PROCESSING	RAW PIT PUMPS	MECHANICAL	2	2024
WASTEWATER PROCESSING	SCREEN WASTE PUMP & VALVE	MECHANICAL	1	2024
WASTEWATER PROCESSING	WWTP _ CRANE	MECHANICAL	1	2024
WASTEWATER PROCESSING	EARTHWORKS/ SITE DEVELOPMENT		1	1988

ASSET **Treatment Plant Spencer Ave**	**DESCRIPTION**	**QTY**	**YEAR**
WASTEWATER TREATMENT	ELECTRICAL CONTROL BUILDING - LOCKWOOD STYLE BUILDING	1	1989
WASTEWATER TREATMENT	EXTRACTOR FANS - CENTRIFUGE BUILDING	1	2018
WASTEWATER TREATMENT	WI-FI WASTEWATER TREATMENT PLANT	1	2017
WASTEWATER TREATMENT	COMPUTER EQUIPMENT	1	2021
WASTEWATER TREATMENT	PLC CONTROLS & STAINLESS STEEL CABINET	1	2005
WASTEWATER TREATMENT	DISTRIBUTION BOARD & STAINLESS STEEL CABINET	1	2005
WASTEWATER TREATMENT	MAIN CONTROL CABINETS, SWITCHGEAR & RETICULATED SERVICES	1	1985
WASTEWATER TREATMENT	VARIABLE SPEED DRIVES - THROUGHOUT (APPROX 12)	1	2005
WASTEWATER TREATMENT	ELECTRONIC POWER FACTOR REGULATOR	1	2005
WASTEWATER TREATMENT	EMERGENCY GENERATOR - 150KVA	1	2005
WASTEWATER TREATMENT	UPS SYSTEM WITH 5 X GXT - 48V BATT BATTERY PACKS	1	2024
WASTEWATER TREATMENT	AIR CONDITIONING SYSTEM	1	2021
WASTEWATER TREATMENT	CLARIFIER A - STAINLESS STEEL CLARIFIER INCLUDING SUPPORT STRUCTURES	1	2005
WASTEWATER TREATMENT	CLARIFIER B - STAINLESS STEEL CLARIFIER INCLUDING SUPPORT STRUCTURES	1	2005
WASTEWATER TREATMENT	THICKENER - STAINLESS STEEL TANK INCLUDING SUPPORT STRUCTURES	1	2005
WASTEWATER TREATMENT	SLUDGE STORAGE TANK - STAINLESS STEEL TANK INCLUDING SUPPORT STRUCTURES	1	2005
WASTEWATER TREATMENT	BREDEL SP40 PERISTALTIC PUMP	2	2008
WASTEWATER TREATMENT	BREDEL SP50 PERISTALTIC PUMP	2	2008
WASTEWATER TREATMENT	BREDEL SP50 PERISTALTIC PUMP - SPARE	1	2023
WASTEWATER TREATMENT	RIB FEED - FIBRE GLASS TANKS	4	1990
WASTEWATER TREATMENT	TREATED EFFLUENT - FIBRE GLASS TANKS	4	1990
WASTEWATER TREATMENT	CENTRIFUGAL PUMPS WITH 3KW MOTORS	2	2019
WASTEWATER TREATMENT	CENTRIFUGAL PUMPS WITH 3KW MOTOR	1	2021
WASTEWATER TREATMENT	ENCLOSED UV STERILISER - NOT IN USE	1	2008
WASTEWATER TREATMENT	AUTOMATED SAMPLING POINT INCLUDING TIMER, VALVES & REFRIGERATED CABINET	1	2,008
WASTEWATER TREATMENT	FABRICATED STAINLESS STEEL LABYRINTHS	1	2008
WASTEWATER TREATMENT	ROYCE 7011A SUSPENDED SOLID ANALYSER	4	2008

WASTEWATER TREATMENT	ROYCE 7011A SUSPENDED SOLID ANALYSER	1	2021
WASTEWATER TREATMENT	MISCELLANEOUS FLOWMETERS & INSTRUMENTS - THROUGHOUT	1	2008
WASTEWATER TREATMENT	STAINLESS STEEL PIPEWORK & VALVES - THROUGHOUT	1	2005
WASTEWATER TREATMENT	MISCELLANEOUS STEEL WALKWAYS & PLATFORMS	1	2005
WASTEWATER TREATMENT	CONCRETE HARDSTANDING FOR PLANT & EQUIPMENT	1	2007
WASTEWATER TREATMENT	CONCRETE BLOCK CONSTRUCTION WITH LONGRUN STEEL ROOF	1	2008
WASTEWATER TREATMENT	CLARIFYING DECANTER COMPLETE WITH CONTROL PANELS, VSD'S, ETC	1	2022
WASTEWATER TREATMENT	INCLINED SCREW CONVEYOR	1	2008
WASTEWATER TREATMENT	TRANSFER SCREW CONVEYOR	1	2021
WASTEWATER TREATMENT	CATIONIC POLYMER DOSING SYSTEM INCLUDING METERING PUMP, DOSING PUMP, DILUTE TANK & ANCILLARIES	1	2021
WASTEWATER TREATMENT	POLYMER RECIRCULATING PUMP	1	2008
WASTEWATER TREATMENT	POLYMER THICKENER DOSING PUMP	1	2008
WASTEWATER TREATMENT	POLYMER CENTRIFUGE DOSING PUMP	1	2020
WASTEWATER TREATMENT	CONTROL ROOM PRESSURISATION SYSTEM	1	2008
WASTEWATER TREATMENT	ALUM TANK - CONCRETE BUND	1	1990
WASTEWATER TREATMENT	ALUM TANK - FIBRE GLASS TANK	1	1990
WASTEWATER TREATMENT	ALUM METERING PUMP	1	2021
WASTEWATER TREATMENT	STATIC MIXERS	1	2005
WASTEWATER TREATMENT	PROCESS WATER CENTRIFUGAL PUMP INCLUDING PIPEWORK & VALVES	1	1990
WASTEWATER TREATMENT	RECYCLE SUMP - UNDERGROUND TANK	1	2000
WASTEWATER TREATMENT	SUBMERSIBLE PUMPS	2	2018
WASTEWATER TREATMENT	AGITATOR	1	2005
WASTEWATER TREATMENT	AGITATOR	1	2022
WASTEWATER TREATMENT	PIPEWORK & VALVES - THROUGHOUT 1	1	2005
WASTEWATER TREATMENT	PIPEWORK & VALVES - THROUGHOUT 2	1	1996
WASTEWATER TREATMENT	PIPEWORK & VALVES - THROUGHOUT 3	1	2009
WASTEWATER TREATMENT	RIB DISCHARGE PIPE	1	2024
WASTEWATER TREATMENT	RIB DISCHARGE CHAMBERS 1	1	1990
WASTEWATER TREATMENT	RIB DISCHARGE CHAMBERS 2	1	2009
WASTEWATER TREATMENT	STORAGE SHED WITH CONCRETE FLOOR	1	2019
WASTEWATER TREATMENT	PUMP - Backup	1	2020
WASTEWATER TREATMENT	PUMP - Backup	1	2022
WASTEWATER TREATMENT	OFFICE/LABORATORY - WEATHERBOARD CONSTRUCTION WITH LONGRUN IRON ROOF	1	1985
WASTEWATER TREATMENT	SEPTIC HOLDING TANK - 25,000 LITRE	1	1988
WASTEWATER TREATMENT	SECURITY FENCING	1	1986

WASTEWATER TREATMENT	SECURITY FENCING - ADDITION 2017	1	2017
WASTEWATER TREATMENT	WWTP _ OVERFLOW STORAGE TANK	1	2021
WASTEWATER TREATMENT	WWTP _ REPEATER (MONIKA LANHAM)	1	2021