THEEWATERSKLOOF MUNICIPALITY

Water Services Development Plan Executive Summary

For IDP incorporation as directed by the Water Services Act (Act 108 of 1997)

2022-2027

DRAFT

DECEMBER 2025

THEEWATERSKLOOF MUNICIPALITY

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THEEWATERSKLOOF MUNICIPALITY

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Approval	Final WSDP Executive Summary	Will be submitted to Council with IDP	Council Resolution for approval will be forwarded by the Municipality to the DWS.

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PROJECT P09992 - THEEWATERSKLOOF MUNICIPALITY'S WSDP EXECUTIVE SUMMARY 2022-2027

REV	DESCRIPTION	ORIG	REVIEW	IX ENGINEERS APPROVAL	DATE	CLIENT APPROVAL	DATE
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2022-2027 WSDP EXECUTIVE SUMMARY

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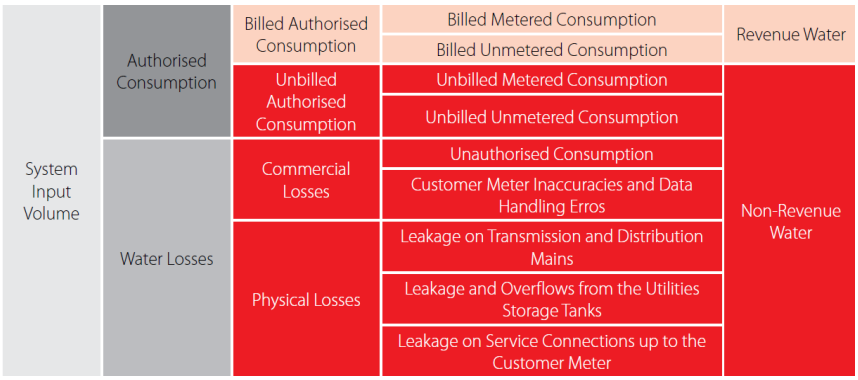
ABBREVIATIONS AND DEFINITIONS

AADD	Average Annual Daily Demand
AC	Asbestos Cement
AMP	Asset Management Plan
AMR	Automatic Meter Reading
BA	Breathing Apparatus
BDRR	Blue Drop Risk Rating
BGWMA	Breede-Gouritz Water Management Area
bh	Borehole
BOWMA	Breede-Olifants Water Management Area
CAP	Corrective Action Plan
CCTV	Closed-Circuit Television
CFO	Chief Financial Officer
CMA	Catchment Management Agency
COD	Chemical Oxygen Demand
COVID	Coronavirus disease 2019
CRC	Current Replacement Cost
CRR	Cumulative Risk Ratio
CV	Carrying Value
DCoG	Department of Cooperative Government
DO	Dissolved Oxygen
DRC	Depreciated Replacement Cost
DWQ	Drinking Water Quality
DWS	Department of Water and Sanitation
DWWTS	Decentralised Wastewater Treatment Systems
EC	Electrical Conductivity
E&H	Endress and Hauser
EHP	Environmental Health Practitionar
EHP	Emergency Housing Programme
EIA	Environmental Impact Assessment
FDA	Future Development Area
FLISP	Finance Linked Individual Subsidy Programme
FY	Financial Year
GAMAP	General Accepted Municipal Accounting Practice
GD	Green Drop
GDIP	Green Drop Improvement Plan
GPS	Global Positioning System
HH	Household
HPC	Heterotrophic Plant Count
HTH	Calcium Hypochlorite
IBT	Inclining Block Tariff
IDP	Integrated Development Plan
ILI	Infrastructure Leakage Index
IMQS	Infrastructure Management Query System
IRDP	Integrated Rural Development Program
IRIS	Integrated Regulatory Information System
IWA	International Water Association
Kl/d	Kilolitre per Day
KPI	Key Performance Indicator
l/c/d	Litre per Capita per Day

l/p/d	Litre per Person per Day
LED	Local Economic Development
LGTAS	Local Government Turn Around Strategy
MCC	Motor Control Centre
MFMA	Municipal Finance Management Act
MIG	Municipal Infrastructure Grant
MISA	Municipal Infrastructure Support Agent
Ml	Mega Litre
Ml/a	Mega Litre per Annum
Ml/d	Mega Litre per Day
MLSS	Mixed Liquor Suspended Solids
MNF	Minimum Night Flow
MTEF	Medium-Term Expenditure Framework
MTREF	Medium Term Revenue Expenditure Framework
MuSSA	Municipal Strategic Self-Assessment
NMR	No Monitoring Required
NRW	Non-Revenue Water
O&M	Operation and Maintenance
OC	Opening Cost
OPEX	Operational Expenditure
PA	Process Audit
PAT	Progress Assessment Tool
PC	Process Controller
PDD	Peak Daily Demand
P&G	Preliminary and General
PRP	Pipe Replacement Prioritisation
PRV	Pressure Reducing Valve
PS	Pump Station
RAS	Return Activated Sludge
RDP	Reconstruction and Development Programme
RUL	Remaining Useful Life
RWWSS	Ruensveld West Water Supply System
SALGA	South African Local Government Association
SANS	South African National Standard
SAPS	South African Police Service
SAR	Sodium Absorption Ratio
SCADA	Supervisory Control and Data Acquisition
SCM	Supply Chain Management
SDBIP	Service Delivery and Budget Implementation Plan
SDF	Spatial Development Framework
SIV	System Input Volume
SLA	Service Level Agreement
SOP	Standard Operating Procedure
SST	Secondary Settling Tank
SVI	Sludge Volume Index
TDS	Total Dissolved Solids
TLM	Theewaterskloof Local Municipality
TMG	Table Mountain Group
TWK	Theewaterskloof

UISP	Upgrading of Informal Settlements Programme
UV	Ultra Violet
VAT	Value Added Tax
VIP	Ventilated Improved Pit
VSC	Volumetric Sludge Concentration
WaSP	Water Safety Plan
WARMS	Water Authorisation Registration and Management System
WC/WDM	Water Conservation / Water Demand Management
WDM	Water Demand Management
WMA	Water Management Area
WSA	Water Services Authority
WSDP	Water Services Development Plan
WSI	Water Services Institution
WSIG	Water Services Infrastructure Grant
WSP	Water Services Provider
WSS	Water Supply System
WTP	Water Treatment Plant
WTW	Water Treatment Works
WUA	Water User Association
WULA	Water Use License Application
W_2RAP	Wastewater Risk Abatement Plan
WWTP	Waste Water Treatment Plant
WWTW	Waste Water Treatment Works
Y	Yield

KEY TERMS AND INTERPRETATIONS

Climate Change	Changes in climatic conditions due to natural causes or to anthropogenic (man-made) effects such as emissions of greenhouse gases, e.g. carbon dioxide, nitrous oxide, and methane, from industry, transport, farming and deforestation, that are expected to have significant consequences for rainfall and water availability on earth.
Current replacement cost (CRC)	The cost of replacing the service potential of an existing asset, by reference to some measure of capacity, with an appropriate modern equivalent asset. GAMAP defines CRC as the cost the entity would incur to acquire the asset on the reporting date.
Depreciated Replacement Cost (DRC)	The replacement cost of an existing asset after deducting an allowance for wear or consumption to reflect the remaining economic life of the existing asset.
Financial Year	Financial year means in relation to- • a national or provincial department, the year ending 31 March; or • a municipality, the year ending 30 June.
Global Warming	The increase in the average surface temperatures across the globe, usually measured over long periods of time; reported to have increased by 1°C over the past hundred years.
Integrated Development Plan (IDP)	An IDP is a legislative requirement for municipalities, which identifies the municipality's key development priorities; formulates a clear vision, mission and values; formulates appropriate strategies; shows the appropriate organisational structure and systems to realise the vision and the mission and aligns resources with the development priorities.
National Water Resource Strategy 2	Sets out how we will achieve the following core objectives: • Water supports development and the elimination of poverty and inequality. • Water contributes to the economy and job creation, and • Water is protected, used, developed, conserved, managed and controlled sustainably and equitably.
International Water Association (IWA) Water Balance	
System Input Volume	The volume of treated water input to that part of the water supply system to which the water balance calculation relates.
Authorised Consumption	The volume of metered and/or un-metered water taken by registered customers, the water supplier and others who are implicitly or explicitly authorised to do so by the water supplier, for residential, commercial and industrial purposes. It also includes water exported across operational boundaries. Authorised consumption may include items such as fire-fighting and training, flushing of mains and sewers, street cleaning, watering of municipal gardens, public fountains, frost protection, building water, etc. These may be billed or unbilled, metered or unmetered.
Water Losses	The difference between System Input and Authorised Consumption. Water losses can be considered as a total volume for the whole system, or for partial systems such as transmission or distribution schemes, or individual zones. Water Losses consist of Physical Losses and Commercial Losses (also known as Real Losses and Apparent Losses).
Billed Authorised Consumption	Those components of Authorised Consumption which are billed and produce revenue (also known as Revenue Water). Equal to Billed Metered Consumption plus Billed Unmetered Consumption.
Unbilled Authorised Consumption	Those components of Authorised Consumption which are legitimate but not billed and therefore do not produce revenue. Equal to Unbilled Metered Consumption plus Unbilled Unmetered Consumption.
Commercial Losses	Includes all types of inaccuracies associated with customer metering as well as data handling errors (meter reading and billing), plus unauthorised consumption (theft or illegal use). Commercial losses are called "Apparent Losses" by the International Water Association and in some countries the misleading term "Non-Technical Losses" is used.

KEY TERMS AND INTERPRETATIONS

Physical Losses	Physical water losses from the pressurized system and the utility's storage tanks, up to the point of customer use. In metered systems this is the customer meter, in unmetered situations this is the first point of use (stop tap/tap) within the property. Physical losses are called "Real Losses" by the International Water Association and in some countries the misleading term "Technical Losses" is used.
Billed Metered Consumption	All metered consumption which is also billed. This includes all groups of customers such as domestic, commercial, industrial or institutional and also includes water transferred across operational boundaries (water exported) which is metered and billed.
Billed Unmetered Consumption	All billed consumption which is calculated based on estimates or norms but is not metered. This might be a very small component in fully metered systems (for example billing based on estimates for the period a customer meter is out of order) but can be the key consumption component in systems without universal metering. This component might also include water transferred across operational boundaries (water exported) which is unmetered but billed.
Unbilled Metered Consumption	Metered Consumption which is for any reason unbilled. This might for example include metered consumption by the utility itself or water provided to institutions free of charge, including water transferred across operational boundaries (water exported) which is metered but unbilled.
Unbilled Unmetered Consumption	Any kind of Authorised Consumption which is neither billed nor metered. This component typically includes items such as fire-fighting, flushing of mains and sewers, street cleaning, frost protection, etc. In a well-run utility it is a small component which is very often substantially overestimated. Theoretically this might also include water transferred across operational boundaries (water exported) which is unmetered and unbilled – although this is an unlikely case.
Unauthorised Consumption	Any unauthorised use of water. This may include illegal water withdrawal from hydrants (for example for construction purposes), illegal connections, bypasses to consumption meters or meter tampering.
Customer Metering Inaccuracies and Data Handling Errors	Commercial water losses caused by customer meter inaccuracies and data handling errors in the meter reading and billing system.
Leakage on Transmission and /or Distribution Mains	Water lost from leaks and breaks on transmission and distribution pipelines. These might either be small leaks which are still unreported (e.g. leaking joints) or large bursts which were reported and repaired but did obviously leak for a certain period before that.
Leakage and Overflows at Utility's Storage Tanks	Water lost from leaking storage tank structures or overflows of such tanks caused by e.g. operational or technical problems.
Leakage on Service Connections up to point of Customer Metering	Water lost from leaks and breaks of service connections from (and including) the tapping point until the point of customer use. In metered systems this is the customer meter, in unmetered situations this is the first point of use (stop tap/tap) within the property. Leakage on service connections might be reported breaks but will predominately be small leaks which do not surface and which run for long periods (often years).
Revenue Water	Those components of Authorised Consumption which are billed and produce revenue (also known as Billed Authorised Consumption). Equal to Billed Metered Consumption plus Billed Unmetered Consumption.
Non-Revenue Water	Those components of System Input which are not billed and do not produce revenue. Equal to Unbilled Authorised Consumption plus Physical and Commercial Water Losses.
Remaining useful life (RUL)	The time remaining over which an asset is expected to be used.
Re-use	Utilisation of treated or untreated wastewater for a process other than the one that generated it. For instance, the re-use of municipal wastewater for agricultural irrigation. Water re-use can be direct or indirect, intentional or unintentional, planned or unplanned, local, regional or national in terms of location, scale and significance. Water re-use may involve various kinds of treatment (or not) and the reclaimed water may be used for a variety of purposes.
Service Delivery Budget Implementation Plan (SDBIP)	The SDBIP is a management, implementation and monitoring tool that enable the City Manager to monitor the performance of senior managers, the Mayor to monitor the performance of the City Manager, and for the community to monitor the performance of the municipality.
Strategic Framework for Water Services	The Strategic Framework provides a comprehensive summary of policy with respect to the water services sector in South Africa and sets out a strategic framework for its implementation over the next ten years.
Water Conservation	The minimisation of loss or waste, the care and protection of water resources and the efficient and effective use of water.
Water Demand Management	The adaptation and implementation of a strategy by a water institution or consumer to influence the water demand and usage of water in order to meet any of the following objectives: economic efficiency, social development, social equity, environmental protection, sustainability of water supply and services, and political acceptability.

KEY TERMS AND INTERPRETATIONS

Water Services Authority (WSA)	A water services authority means a municipality with the executive authority and the right to administer water services as authorised in terms of the Municipal Structures Act, 1998 (Act No.117 of 1998). There can only be one water services authority in any specific area. Water services authority area boundaries cannot overlap. Water services authorities are metropolitan municipalities, district municipalities and authorised local municipalities.
Water Services Development Plan (WSDP)	A plan to be developed and adopted by the WSA in terms of the Water Services Act, 1997 (Act No.108 of 1997)
WSDP Guide Framework	Modular tool which has been developed by the DWS to support WSAs in complying to the Water Services Act with respect to Water Services Development Planning and which is also used by the DWS to regulate such compliance.
Water Services Provider (WSP)	A WSP means any person or institution that provides water services to consumers or to another water services institution, but does not include a water services intermediary.

WSDP – IDP Water Sector Input Report (Executive Summary)

Introduction

Every WSA has a duty to all customers or potential customers in its area of jurisdiction to progressively ensure efficient, affordable, economical and sustainable access to water services that promote sustainable livelihoods and economic development.

Sections 12 and 13 of the Water Services Act (Act No 108 of 1997) place a duty on WSAs to prepare and maintain a WSDP. The DWS has developed a new WSDP website (Rolled-out to all WSAs during 2017) to assist WSAs with their WSDP process and to provide a framework for the capturing of the data. The topics included in the guidelines and addressed in detail in Theewaterskloof Municipality's WSDP are as follows:

- Settlements and Demographics
- Service Levels
- Water Services Infrastructure Management (Infrastructure)
- Water Services Infrastructure Management (O&M)
- Conservation and Demand Management
- Water Resources
- Financial
- Institutional Arrangements and Customer Care

The primary instrument of planning in the water services sector is the WSDP. The following principles apply to the WSDP:

- All WSAs must develop a WSDP.
- A new plan must be developed every five years and the plan should be updated as necessary and appropriate in the interim years.
- The WSDP must be integrated with the IDP of the municipality, as required in terms of the Municipal Systems Act.
- The WSDP must integrate water supply planning with sanitation planning.
- The WSDP must integrate technical planning with social, institutional, financial and environmental planning. The planning of capital expenditure must also be integrated with the associated operation and maintenance requirements and expenditures.
- The WSDP must be informed by the business plans developed by water services providers and with the plans of any regional water services providers, as relevant.
- The plan must take into account the impact of HIV/Aids on future water demand.
- The WSDP must integrate with the catchment management strategy.
- The planning process must take into account the views of all important stakeholders, including communities, through a consultative and participatory process. Every effort must be made to ensure the adequate and meaningful participation of women in consultation forums.
- The draft plan must be made available for public and stakeholder comment and all comments made must be considered when preparing the final plan.
- The contents of the WSDP must be communicated to all important stakeholders, including the DWS.
- A WSA must report annually and in a public way on progress in implementing the plan (WSDP Performance and Water Services Audit Report).

The 2022-2027 WSDP for Theewaterskloof Municipality consists of the following documents and processes.

- WSDP Executive Summary Report, which can be used for Council approval and for the Public Participation Process;
- Administration, Information and Comprehensive Overview Report;
- Master Plan: Future Demand and Functionality Requirements Report; and
- Updated WSDP website.

The WSDP Executive Summary Report must be submitted to the Council for their approval and issued to the public for their comment.

The purpose of this report is to provide relevant and summarised WSDP inputs for incorporation into Theewaterskloof Municipality's IDP process and is structured as follows:

Section A: **Status Quo Overview**: Provides a summarised overview of the water services status quo in terms of the water services functional business elements as aligned to the WSDP framework.

Section B: **State of Water Services Planning:** Presents the status of- and references the water services planning within Theewaterskloof Municipality.

Section C: **Water Services Existing Needs Perspective:** Gives an overview of Theewaterskloof Municipality's assessment and interpretation of its water services, with specific focus on problem definition statements.

Section D: **Water Services Objectives and Strategies:** Outlines the 5-year water services objectives and strategies as developed through the WSDP process for incorporation in terms of the IDP and aligned to the water services functional business elements.

Section E: **Water Services MTEF Projects:** The agreed water services projects for the medium-term expenditure framework and inclusive of funding sources.

Section F: **WSDP Projects:** Presents the projects identified during the WSDP process in order to meet the water services strategies of Theewaterskloof Municipality, as aligned to the outflow from the situation analysis per water services business element.

SECTION A: STATUS QUO OVERVIEW

Theewaterskloof Municipality is situated within the newly established Breede-Olifants Water Management Area. The Municipality is located within the Overberg Region of the Western Cape Province, in which the following Local Municipalities are also located:

- Cape Agulhas Municipality;
- Overstrand Municipality; and
- Swellendam Municipality.

The Municipality consists of 14 individual wards and is the only WSA within this municipal area and is also the WSP. Theewaterskloof Municipality's Management Area includes the following towns and urban areas (***Water Distribution Systems***):

- Bot River – Bot River System
- Caledon and Myddleton – Caledon System
- Genadendal, Voorstekraal and Bereaville - Greater Genadendal System
- Grabouw – Grabouw System
- Greyton and Boschmanskloof – Greyton System
- Riviersonderend – Riviersonderend System
- Tesselaarsdal and Bethoeskloof – Tesselaarsdal System
- Villiersdorp – Villiersdorp System
- The rural farm areas

Physical Perspective:

Climate change: It is necessary for WSAs to develop climate response strategies and include these in their WSDPs, implement WC/WDM and reduce levels of NRW. Water-related climate change adaptation and mitigation planning should be incorporated into all WSDPs and IDPs. The implementation of WC/WDM is a critical element of adapting to climate change. This must be implemented by all water sector institutions and water users and should include the optimisation of dam and groundwater operation, as well as the reduction of physical water losses and the introduction of water-efficient appliances, processes and crops.

In terms of adapting for climate change, water systems will need to be more robust and new / alternative sources of supply may need to be found. Increased skills will be required from water managers and long-term water projections are required. Although an overall decrease in rainfall is generally not forecasted, increased variability in the climate and frequency of extreme events, as well as increased temperature and wind could have an impact on water sources, particularly surface waters. Almost all the bulk water supplied to the towns in Theewaterskloof Municipality's Management Area is from surface water sources.

Due to the uncertainty associated with the impact of climate change on water demand and on water resources, it would be prudent to adopt the precautionary principle. The following scenario is likely:

- As a result of uncertainty about future rainfall, all resources, especially surface water resources, may be under pressure and may have lower safe yields.
- Due to increased heat units water demand from agriculture, as well as from towns (approximately 62% of all water) will rise sharply.
- Even in the event that average annual rainfalls would not reduce much, it is anticipated that much greater variability of rainfall will occur within a year and also between years due to more extreme climatic conditions.

It is therefore advisable for Theewaterskloof Municipality that a conservative approach be followed regarding the management of water sources. It is proposed that the following approach be adopted to mitigate and adapt to the impacts of climate change:

- All resources, especially surface water resources, need to be re-evaluated, especially where demand is close to the safe one in twenty-year yields. It is therefore important to establish assurance of supply levels of all water sources;
- increase assurance of supply of the water resources by ensuring that there is at least 10% additional capacity (headroom), when considering the maximum 24-hour demand on the peak month of the year;
- do not undertake new developments unless a proper investigation of the implication on water sources and sustainability in the long term has been undertaken;
- vigorously implement WDM measures, especially in terms of the following:
  - increased water efficiency
  - frequent monitoring of the water supply system, from the sources to the consumers; and
  - regular and adequate system maintenance and repairs.
- Diversify water resources, e.g. surface water, groundwater, wastewater re-use and sea water desalination.

Floods: One of the climate change threats in some parts of the Western Cape is the likelihood of floods with greater intensity and longer-term impacts. There is likely to be increases in the severity and unpredictability of weather patterns. Flooding and storms are predicted which could have devastating effects on agricultural production.

Natural Environment:

There are no National Parks within the Theewaterskloof Municipal area, although it includes eight notable sensitive natural environments and conservation areas. The largest of several Conservation Areas within the Theewaterskloof Municipal area is the Cape Nature Conservation near Villiersdorp. A portion of the Hottentots Holland Nature Reserve also lies within the boundary of the Theewaterskloof Municipality along the north-western and western border.

There are three municipal nature reserves, namely Caledon, Villiersdorp and Greyton, adjacent to the respective towns, which protect important biodiversity. Much of the high priority areas for protecting remaining biodiversity in the lowlands are located on private land. Conservation on private land is implemented through the Cape Nature stewardship programme, as well as related initiatives such as conservancies (e.g. Klein Swartberg and Groenlandberg) and easements with non-governmental organisations. Conservancies within Theewaterskloof include Theewaters-, Groenlandberg-, Klein Swartberg- and Akkedisberg Conservancy.

TOPIC 1: SETTLEMENTS AND DEMOGRAPHICS

The tables below gives an overview of the settlements, population and households in Theewaterskloof Municipality's Management Area for 2023/2024. The number of settlements were done according to the grouping of the different areas in DWS's GeoDatabase.

Table A.1.1: Settlement Summary

Section	Number	Assessment Score
1.1 Total Population	188 358	80%
1.2 Total Number of Households (Permanent)	49 883	80%
1.3 Average Household Size	3.77	80%
1.4 Total Number of Settlements (GeoDatabase)	66	80%

Note: The score of 80% in the above table is Excellent, which is the highest score in DWS's eWSDP website.

Table A.1.2 Summary by Settlement Group (Urban / Rural Split)				
Settlement Type	**Settlements**	**Population**	**Households**	**Assessment Score**
Rural	2	42 216	9 890	80%
Urban	64	146 142	39 993	80%
Total	**66**	**188 358**	**49 883**	**80%**

Note: The score of 80% in the above table is Excellent, which is the highest score in DWS's eWSDP website.

Table A.1.3 Assessment Score by Settlement Type						
Main Type	**Settlement Type**	**Settlements**	**Population**	**Households**	**Avg. Household Size**	**Assessment Score**
Rural	Farming	1	40 540	9 497	4.27	80%
Rural	Rural Scattered Low Density	1	1 676	393	4.27	80%
Urban	Urban - Informal Settlements (Squatter Camp)	38	76 400	19 100	4.00	80%
Urban	Urban - Formal Town	28	69 742	20 893	3.34	80%
Total		**66**	**188 358**	**49 883**	**3.78**	**80%**

Note: The score of 80% in the above table is Excellent, which is the highest score in DWS's eWSDP website.

Table.A.1.4 Amenities Summary (Health and Educational facilities)		
Amenity Type	**Number of Amenities**	**Assessment Score**
Health Facilities	15	80%
Educational facilities	38	80%

Note: The score of 80% in the above table is Excellent, which is the highest score in DWS's eWSDP website.

The published 2022 Census population for Theewaterskloof Municipality was 139 563 persons (Annual growth rate of 2.4% over the period 2011 to 2022) and the number of permanent households was 43 121. The 2022 Census data is not yet available per town and it was therefore not possible to update Theewaterskloof Municipality's projected population and households per town at this stage.

Theewaterskloof Municipality's Draft Spatial Development Framework (SDF), June 2023, estimated the 2023 population at 125 911 persons and the number of permanent households at 34 206.

The 2024 Socio Economic Profile of Theewaterskloof Municipality includes a population figure of 128 320 persons and a permanent household figure of 33 088 households for 2024.

The 2023/2024 populations for the various water distribution systems were estimated by applying the annual growth rates as indicated in the table below. The current population figures and the annual population growth percentages used in the WSDP Performance- and Water Services Audit Report are aligned with the figures used in DWS's GeoDatabase. The future estimated annual population growth percentages, as listed in the table below, were agreed with the Municipality's Community Services and Engineering Planning Departments during January 2014. Adjustments were only made to the historical annual population growth percentages for Grabouw and Villiersdorp for the period 2011 to 2023, due to the large number of confirmed dwellings in the informal areas in these two towns.

Table A.1.5: Estimated future annual population growth percentages, population and households per distribution system			
Town	**Estimated future annual Population Growth % from 2023/2024 onwards**	**Projected 2023/2024 Persons**	**Projected 2023/2024 Households**
Grabouw	3.5%	85 331	21 680
Bot River	3.5%	8 317	2 386
Villiersdorp	3.0%	16 210	5 618
Caledon	2.5%	18 804	5 093
Bereaville	1.6%	851	236
Voorstekraal	2.0%	1 030	293
Genadendal	1.0%	4 674	1 315
Greyton	2.8%	3 871	1 378
Riviersonderend	2.5%	7 054	1 994
Tesselaarsdal	2.5%	1 676	393
Farms	1.5%	40 540	9 497
Total		**188 358**	**49 883**

The current 2023/2024 population for Theewaterskloof Municipality is therefore estimated at 188 358 persons and the permanent households at 49 883, as indicated in the table above.

WSDP EXECUTIVE SUMMARY 2022-2027

The table below gives an overview of the projected population and permanent number of households and the water and sanitation service levels in Theewaterskloof Municipality's Management Area.

Table A.1.6: Water Services Overview (Water)

Settlement Type	2011/2012 Households	2011/2012 Population	2023/2024 Households	2023/2024 Population	Water category: Adequate: Formal	Water: Adequate: Informal	Water: Adequate: Sahred Services	Water: Water resources needs only	Water: O&M needs only	Water: Infrastructure needs only	Water: Infrastructure & O&M needs	Water: Infrastructure, O&M & Resource need	Water: No Services: Informal	Water: No Services: Formal	Sanitation category: Adequate: Formal	Sanitation: Adequate: Informal	Sanitation: Adequate: Sahred Services	Sanitation: Water resources needs only	Sanitation: O&M needs only	Sanitation: Infrastructure needs only	Sanitation: Infrastructure & O&M needs	Sanitation: Infrastructure, O&M & Resource need	Sanitation: No Services: Informal	Sanitation: No Services: Formal
URBAN																								
Metropolitan Area					Adequate			Below RDP					None		Adequate			Below RDP					None	
Sub-Total	0	0	0	0																				
Formal Town					Adequate			Below RDP					None		Adequate			Below RDP					None	
Grabouw	3 555	9 573	6 108	24 041	P		P								P		P							
Bot River	1 167	3 444	2 031	7 080	P		P								P		P							
Villiersdorp	1 760	1 380	1 556	4 490	P		P								P		P							
Caledon	3 707	13 582	3 879	14 322	P		P								P		P							
Bereaville	195	703	211	761	P		P								P		P							
Voorstekraal	231	812	293	1 030	P		P								P		P							
Genadendal	1 167	4 148	1 310	4 656	P		P								P		P							
Greyton	989	2 779	1 180	3315	P		P								P		P							
Riviersonderend	1 363	4 645	1 852	6552	P		P								P		P							
Sub-Total	**14 134**	**41 066**	**18 420**	**66 247**	**9**	**0**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9**	**0**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Townships					Adequate			Below RDP					None		Adequate			Below RDP					None	
Sub-Total	0	0	0	0																				
Informal Settlements					Adequate			Below RDP					None		Adequate			Below RDP					None	
Grabouw	4 153	20 765	15 572	61 290		P							P			P							P	
Bot River	412	2 060	355	1 237		P							P			P							P	
Villiersdorp	1 749	8 745	4 062	11 720		P							P			P							P	
Caledon	80	400	1 214	4 482		P							P			P							P	
Genadendal	0	0	5	18									P										P	
Bereaville	0	0	25	90		P										P								
Greyton	0	0	198	556		P							P			P							P	
Riviersonderend	120	600	142	502		P										P								
Sub-Total	**6 514**	**32 570**	**21 573**	**79 895**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**0**
Working towns & service centres					Adequate			Below RDP					None		Adequate			Below RDP					None	
Sub-Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-Total: (Urban)	**20 648**	**73 636**	**39 993**	**146 142**	**9**	**7**	**9**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**9**	**7**	**9**	**0**	**0**	**0**	**0**	**0**	**6**	**0**
RURAL																								
Rural / Farming					Adequate			Below RDP					None		Adequate			Below RDP					None	
Tesselaarsdal	292	1 246	393	1 676	P		P								P		P							
Farms	7 943	33 907	9 497	40 540	P		P							P	P		P							P
Sub-Total	**8 235**	**35 153**	**9 890**	**42 216**	**2**		**2**							**1**	**2**		**2**							**1**
Informal Settlements					Adequate			Below RDP					None		Adequate			Below RDP					None	
Sub-Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-Total (Rural)	**8 235**	**35 153**	**9 890**	**42 216**	**2**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
TOTAL	**28 883**	**108 789**	**49 883**	**188 358**	**11**	**7**	**11**	**0**	**0**	**0**	**0**	**0**	**6**	**1**	**11**	**7**	**11**	**0**	**0**	**0**	**0**	**0**	**6**	**1**

TOPIC 2: SERVICE LEVELS

The National Norms and Standards for Domestic Water and Sanitation Services, as published in the Government Gazette No.41100 of 8 September 2017, make provision for the following norms and standards for levels of water supply and sanitation services:

Table A.2.1: Norms and Standards for Levels of Water Supply Services		
Full level of service: People access and pay for more than 90 l/c/d at high pressure.	Interim **Full**	**Full provision**: People access a minimum of 50 l/c/d of SANS241 quality water on demand at the boundary of the yard, metered and tariffed.
Middle level of service: People access and pay for 51-90 l/c/d at medium pressure.	Interim **Upper**	**Upper provision**: People access a maximum of 90 l/c/d of SANS241 quality water from an improved source at the boundary of the yard, metered and tariffed.
	Interim **Intermediate**	Intermediate provision: People access more than 50 l/c/d but less than 90 l/c/d of SANS241 quality water from an improved source at the boundary of the yard, metered and tariffed.
Minimum level of service: People access 25-50 l/c/d at low to medium pressure, use of more than 25 l/c/d is paid for.	Interim **Basic Plus**	**Basic Plus provision**: People access more than 25 l/c/d but less than 50 l/c/d of SANS241 quality water from an improved source at the boundary of the yard, metered and tariffed.
	Interim **Basic**	**Basic provision**: People access a minimum of 25 l/c/d of SANS241 quality water from an improved source at the boundary of the yard, metered and tariffed.
	Interim **Free Basic**	**Free basic provision**: People access a minimum of 25 l/c/d of SANS241 quality water from an improved source at the boundary of the yard, metered.
	Intermittent	**Intermittent provision**: People access a minimum of 1500 l/household/week of acceptable quality water on a weekly basis within 100m, which is metered.
Bulk service: Source of potable water to be provided to people, which is metered in all circumstances.		
No service / provision = backlog: People access water from insecure or unimproved sources, or sources that are too distant, too time consuming or are of poor quality.		

Interim provision: People access a minimum of 25 l/c/d of acceptable quality water within 24 hours of disruption, normal service to be restored within 7 days.

Proper disposal, clean platform, vector and rodent control, resource use and health protection.

Table A.2.2: Norms and Standards for Levels of Sanitation Services		
Hygiene promotion; Prevention of pollution; Re-use / recycle; Operation and Maintenance; Metering and tariffing; Solid Waste Management; Asset Management		
Full level: Full concern for human health, environment and sustainability of interconnected systems.	**Full services**	**In-house facility**: Storm water, wastewater/excreta, greywater, solid waste are collected and managed to achieve maximum benefits from treatment and re-use of water and nutrients.
		In-house facility: Access to a pleasant, safe, reliable and properly maintained facility for 24 hours a day, with control of nutrients in human excreta, wastewater and greywater.
Basic level: Remove excreta from the environment through treatment, pathogen reduction, resource recovery and nutrient reuse.	**Free basic services**	**Toilet with functional hand washing facility in the yard**: Access to a pleasant, safe and reliable facility for 24 hours a day, including privacy, personal safety and shelter through a subsidy for free. Maintenance of the facility is for free and is the responsibility of services provider.
	Basic services	**Toilet with functional hand washing facility in the yard**. Access to a pleasant, safe and reliable facility for 24 hours a day, including privacy, personal safety and shelter through a capital subsidy. Maintenance of the facilities is not for free and is the responsibility of the household / owner.
Interim level: Blocking the spread of faecal-oral diseases through proper excreta containment at a fixed point.	**Excreta containment**	**Household, shared or communal toilets with functional hand washing facilities**: Access to safe, reliable and properly maintained toilet and hand washing facility, free of charge, within 200m of the dwelling, which at a minimum safely contains human excreta. Maintenance is the responsibility of the services provider. To be phased out by 2030.
No service / provision = backlog: People practice open defecation or access an unimproved sanitation facility, such as pit toilets and bucket toilets. To be completely eliminated by 2030.		

Emergency level: People access pleasant, safe, reliable and properly maintained improved toilets and hand washing facility on the premises in close proximity to the temporary dwelling within 24 hours and for duration of event.

All the formal households in the urban areas of Theewaterskloof Municipality's Management Area are provided with water and sewer connections inside the erven. Theewaterskloof Municipality needs to ensure compliance with the requirements for interim water and sanitation supply services for the provision of services in their informal areas. Theewaterskloof Municipality also needs to ensure that private landowners provide at least basic water and sanitation services to those households in the rural areas with existing services below basic standard.

The table and graph below give an overview of the water service delivery access profile of Theewaterskloof Municipality.

Table A.2.3: Residential Water Services Delivery Access Profile: Water							
Census Category	Description	Year 0		Year -1		Year 2	
		FY2023/24		FY2022/23		FY2021/22	
		Nr	%	Nr	%	Nr	%
	WATER (ABOVE MIN LEVEL)						
Piped (tap) water inside dwelling/institution	House connections	22 752	46%	21 625	46%	20 575	46%
Piped (tap) water inside yard	Yard connections	5 019	10%	4 770	10%	4 539	10%
Piped (tap) water on community stand: distance less than 200m from dwelling/institution	Standpipe connection < 200 m	4 851	10%	4 611	10%	4 387	10%
	Sub-Total: Minimum Serivce Level and Above	**32 622**	**65%**	**31 007**	**65%**	**29 501**	**65%**
	WATER (BELOW MIN LEVEL)						
Piped (tap) water on community stand: distance between 200m and 500m from dwelling/institution	Standpipe connection: > 200 m < 500 m	14 757	30%	14 021	30%	13 335	30%
Piped (tap) water on community stand: distance between 500m and 1000m (1km) from dwelling /institution	Standpipe connection: > 500 m < 1 000 m	77	0%	77	0%	77	0%
Piped (tap) water on community stand: distance greater than 1000m (1km) from dwelling/institution	Standpipe connection: > 1 000 m	39	0%	39	0%	39	0%
No access to piped (tap) water	No services	2 388	5%	2 269	5%	2 158	5%
	Sub-Total: Below Minimum Service Level	**17 261**	**35%**	**16 406**	**35%**	**15 609**	**35%**
	Total number of households	**49 883**	**100%**	**47 413**	**100%**	**45 110**	**100%**

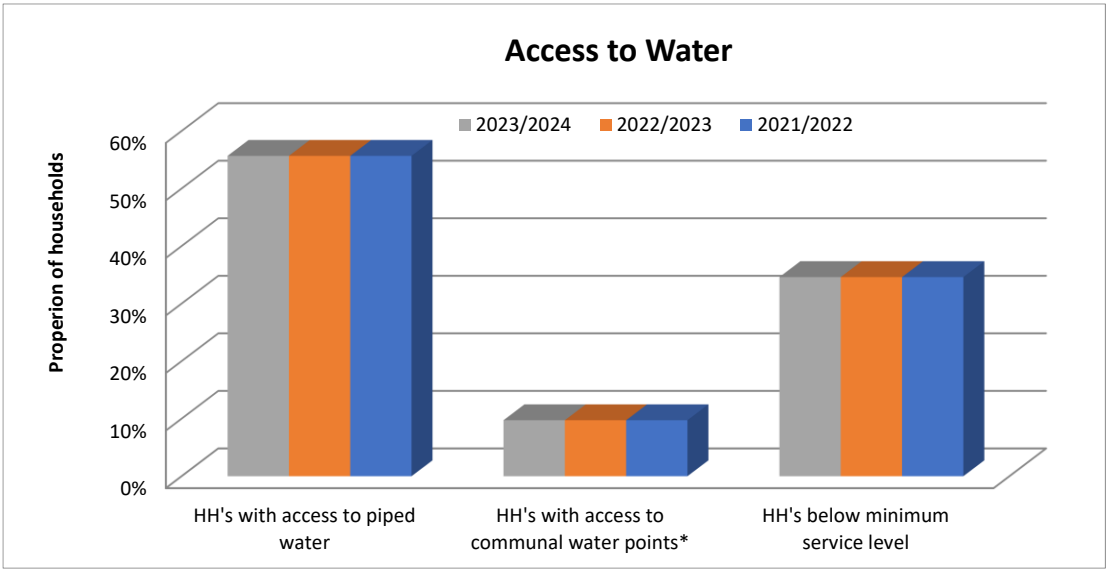


Figure A.2.1: Access to Water Services.

The existing residential water service levels in Theewaterskloof Municipality's Management Area are estimated as follows (June 2024):

Table A.2.4: Residential water service levels

Service Level	Bot River	Caledon	Genadendal	Bereaville	Voorstekraal	Grabouw	Greyton	Riviersonderend	Tesselaarsdal	Villiersdorp	Farms	Total
No Water Services	0	0	0	0	0	0	0	0	0	0	90 [2)]	90
Below RDP: Infrastructure Upgrade	0	0	0	0	0	0	0	0	0	0	0	0
Below RDP: Infrastructure Extension	0	0	0	0	0	0	0	0	0	0	206 [3)]	206
Below RDP: Infrastructure Refurbishment	0	0	0	0	0	0	0	0	0	0	0	0
Below RDP: O&M Needs	0	0	0	0	0	0	0	0	0	0	0	0
Below RDP: Water Resource Needs	0	0	0	0	0	0	0	0	0	0	0	0
Below RDP: Infrastructure and O&M Needs	0	0	0	0	0	0	0	0	0	0	0	0
Below RDP: Infrastructure, O&M and Water Resource Needs	0	0	0	0	0	0	0	0	0	0	0	0
Total Basic Need (RDP)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**296**	**296**
Below Housing Interim [4)]	56	714	5	0	0	13 114	148	0	0	2 928	0	16 965
Adequate Housing Permanent [5)]	299	500	0	25	0	2 458	50	142	0	1 134	0	4 608
Total Housing Need	**355**	**1 214**	**5**	**25**	**0**	**15 572**	**198**	**142**	**0**	**4 062**	**0**	**21 573**
Standpipes	0	0	0	0	0	0	0	0	0	0	243	243
Yard Connections [6)]	758	1 187	310	32	70	570	424	708	128	65	767	5 019
House Connections [1)]	1 273	2 692	1 000	179	223	5 538	756	1 144	265	1 491	8 191	22 752
Total Adequate	**2 031**	**3 879**	**1 310**	**211**	**293**	**6 108**	**1 180**	**1 852**	**393**	**1 556**	**9 201**	**28 014**
Total Residential Consumer Units	**2 386**	**5 093**	**1 315**	**236**	**293**	**21 680**	**1 378**	**1 994**	**393**	**5 618**	**9 497**	**49 883**

Notes:
1) Number of residential Billed Metered Consumers for the various towns for 2023/2024, as taken from the financial system.
2) Census 2011: Number of households with no access to piped (tap) water 90
3) Census 2011: Number of households with communal services (200m – 500m) 90, (500m – 1000m) 77 and (>1000m) 39.
4) Below Housing Interim in the above table is the number of households in informal areas without adequate communal water services, > 25 hh / communal tap or no services
5) Adequate Housing Permanent in the above table is the number of households in informal areas with adequate communal water services, ≤ 25 hh / communal tap
6) Estimated number of backyard dwellers (Projected number of households – Number of households in informal areas – Number of Billed Metered Consumers).

Table A.2.5: Improvement in Eradicating the Water Backlog					
Settlement	Urban / Rural	2023/24		2022/23 (-Y1)	
		Water backlog HH	Water Backlog Population	Water backlog HH	Water Backlog Population
Bot River	Urban	56	195	56	195
Caledon	Urban	714	2 636	714	2 636
Genadendal	Urban	5	18	5	18
Bereaville	Urban	0	0	0	0
Voorstekraal	Urban	0	0	0	0
Grabouw	Urban	13 114	51 615	13 114	51 615
Greyton	Urban	148	416	148	416
Riviersonderend	Urban	0	0	0	0
Tesselaarsdal	Rural	0	0	0	0
Villiersdorp	Urban	2 928	8 448	2 928	8 448
Farms	Rural	296	1 264	296	1 264
Total		**17 261**	**64 592**	**17 261**	**64 592**

Table A.2.6: Water Supply Level Profile (Households)		
Section: Residential water services infrastructure supply level profile	Totals	Assessment Score
Total households with a water need (Irrelevant the type of need)	**17 261**	**60%**
Total households below RDP	**17 261**	**60%**
Piped water inside the dwelling/house	22 752	80%
Piped water inside yard	5 019	60%
Piped water distance <200m	4 851	60%
Piped water distance >200m	17 171	60%
Water Other (Include no water)	90	60%
Total	**49 883**	**60%**

Note: The scores of 60% and 80% in the above table is Good and Excellent. 80% is the highest score in DWS's eWSDP website.

Table A.2.7: Water Reliability Profile (Households)		
Section: Water Reliability Profile	Totals	Assessment Score
Total Number of Households having Reliable Service	32 622	80%
Total Number of Households NOT having Reliable Service	17 261	60%

Note: The scores of 60% and 80% in the above table is Good and Excellent. 80% is the highest score in DWS's eWSDP website.

The table and graph below give an overview of the sanitation service delivery access profile in Theewaterskloof Municipality's Management Area.

Table A.2.8: Residential Water Services Delivery Access Profile: Sanitation							
Census Category	Description	Year 0		Year -1		Year 2	
		FY2023/24		FY2022/23		FY2021/22	
		Nr	%	Nr	%	Nr	%
	SANITATION (ABOVE MIN LEVEL)						
Flush toilet (connected to sewerage system)	Waterborne	17 284	35%	16 422	35%	15 619	35%
	Waterborne: Low Flush	0	0%	0	0%	0	0%
Flush toilet (with septic tank)	Septic tanks / Conservancy	10 006	20%	9 507	20%	9 042	20%
Chemical toilet	Non-waterborne (min. service level)	75	0%	75	0%	75	0%
Pit toilet with ventilation (VIP)		140	0%	140	0%	140	0%
Other / Communal Services	Waterborne (min. service level, communal)	3 837	8%	3 646	8%	3 467	8%
	Sub-Total: Minimum Serivce Level and Above	**31 342**	**63%**	**29 790**	**63%**	**28 343**	**63%**
	SANITATION (BELOW MIN LEVEL)						
Pit toilet without ventilation	Pit toilet	186	0%	186	0%	186	0%
Bucket toilet	Bucket toilet	70	0%	70	0%	70	0%
Other toilet provision (below min. service level	Other	15 037	30%	14 282	30%	13 578	30%
No toilet provisions	No services	3 248	7%	3 085	7%	2 933	7%
	Sub-Total: Below Minimum Service Level	**18 541**	**37%**	**17 623**	**37%**	**16 767**	**37%**
	Total number of households	**49 883**	**100%**	**47 413**	**100%**	**45 110**	**100%**

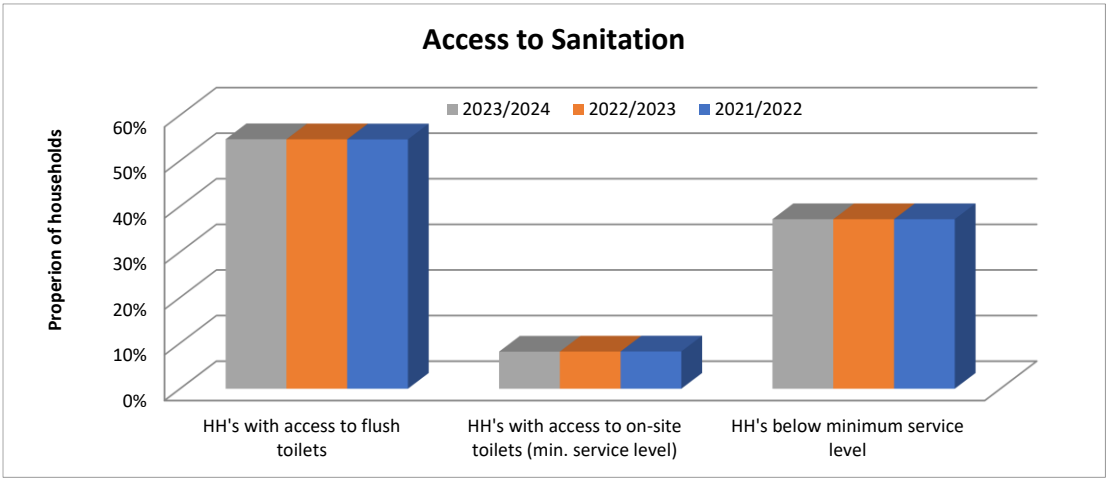


Figure A.2.2: Access to Sanitation Services.

The existing residential sanitation service levels in Theewaterskloof Municipality's Management Area are estimated as follows:

Table A.2.9: Residential sanitation service levels

Service Levels	Bot River	Caledon	Genadendal	Bereaville	Voorstekraal	Grabouw	Greyton	Riviersonderend	Tesselaarsdal	Villiersdorp	Farms	Total
No Sanitation Services	0	0	0	0	0	0	0	0	0	0	390 [2)]	390
Below RDP: Infrastructure Upgrade	0	0	0	0	0	0	0	0	0	0	490 [3)]	490
Below RDP: Infrastructure Extension	0	0	0	0	0	0	0	0	0	0	0	0
Below RDP: Infrastructure Refurbishment	0	0	0	0	0	0	0	0	0	0	0	0
Below RDP: O&M Needs	0	0	0	0	0	0	0	0	0	0	0	0
Below RDP: Water Resource Needs	0	0	0	0	0	0	0	0	0	0	0	0
Below RDP: Infrastructure and O&M Needs	0	0	0	0	0	0	0	0	0	0	0	0
Below RDP: Infrastructure, O&M and Water Resource Needs	0	0	0	0	0	0	0	0	0	0	0	0
Total Basic Need (RDP)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**880**	**880**
Below Housing Interim [4)]	81	944	5	0	0	12 089	148	0	0	2 338	0	15 605
Adequate Housing Permanent [5)]	274	270	0	25	0	3 483	50	142	0	1 724	0	5 968
Total Housing Need	**355**	**1 214**	**5**	**25**	**0**	**15 572**	**198**	**142**	**0**	**4 062**	**0**	**21 573**
No Waterborne (VIP)	0	0	0	0	0	0	0	0	0	0	140	140
Waterborne Low Flush	0	0	0	0	0	0	0	0	0	0	0	0
Septic Tanks / Conservancy Tanks [1)]	250	0	0	211	10	0	680	0	303	75	8 477	10 006
Waterborne [1)]	1 781	3 879	1 310	0	283	6 108	500	1 852	90	1 481	0	17 284
Total Adequate [2)]	**2 031**	**3 879**	**1 310**	**211**	**293**	**6 108**	**1 180**	**1 852**	**393**	**1 556**	**8 617**	**27 430**
Total Residential Consumer Units	**2 386**	**5 093**	**1 315**	**236**	**293**	**21 680**	**1 378**	**1 994**	**393**	**5 618**	**9 497**	**49 883**

Notes: 1) Include Backyard dwellers

2) Census 2011: Number of households with no toilet facility 390.

3) Census 2011: Number of households with existing buckets 70, chemical toilets 75, pit toilets without ventilation 186 and "other" 159.

4) Below Housing Interim in the above table is the number of households in informal areas without adequate communal sanitation services, > 10 hh / communal toilet or no services

5) Adequate Housing Permanent in the above table is the number of households in informal areas with adequate communal sanitation services, ≤ 10 hh / communal toilet

Table A.2.10: Improvement in Eradicating the Sanitation Backlog					
Settlement	Urban / Rural	2023/24		2022/23 (-Y1)	
		Sanitation backlog HH	Sanitation Backlog Population	Sanitation backlog HH	Sanitation Backlog Population
Bot River	Urban	81	282	81	282
Caledon	Urban	944	3 485	944	3 485
Genadendal	Urban	5	18	5	18
Bereaville	Urban	0	0	0	0
Voorstekraal	Urban	0	0	0	0
Grabouw	Urban	12 089	47 581	12 089	47 581
Greyton	Urban	148	416	148	416
Riviersonderend	Urban	0	0	0	0
Tesselaarsdal	Rural	0	0	0	0
Villiersdorp	Urban	2 338	6 746	2 338	6 746
Farms	Rural	880	3 756	880	3 756
Total		**16 485**	**62 284**	**16 485**	**62 284**

Table A.2.11: Sanitation Level of Service (Households)		
Section: Residential sanitation services infrastructure supply level profile	Totals	Assessment Score
Flush toilet (connected to sewerage system)	23 252	80%
Flush toilet (with septic tank)	10 006	80%
Chemical toilet	75	60%
Pit toilet with ventilation (VIP)	140	60%
Pit without ventilation	186	60%
Bucket Toilet	70	60%
None	16 154	60%
Total	**49 883**	**60%**

Note: The scores of 60% and 80% in the above table is Good and Excellent. 80% is the highest score in DWS's eWSDP website.

Table A.2.12: Sanitation Reliability Profile (Households)		
Section: Sanitation reliability profile	Totals	Assessment Score
Total number of households having reliable service	**33 398**	**80%**
Total number of households not having reliable service	**16 485**	**60%**
Infrastructure to be upgraded: None to VIP	549	60%
Infrastructure requirement: Bucket to VIP	70	60%
Infrastructure requirement: None to waterborne	15 605	60%
Infrastructure to be upgraded: Pit to VIP	186	60%
Number of households NOT having reliable service due to: Functionality	75	60%

Note: The scores of 60% and 80% in the above table is Good and Excellent. 80% is the highest score in DWS's eWSDP website.

The projected figures in the previous tables for sanitation services for the farms are still based on the 2011 Census data and can only be updated once the 2022 Census data becomes available per town or subplace.

Table A.2.13: Direct Backlog (Water and Sanitation)		
Direct Backlog (Water & Sanitation)	Totals	Assessment Score
Direct settlement backlog water households. Total household of settlement with a water need (irrelevant the type of need)	17 261	60%
Direct settlement backlog water population. Total population of settlement with a water need (irrelevant the type of need)	64 592	60%
Direct settlement backlog sanitation households. Total household of settlement with a sanitation need (irrelevant the type of need)	16 485	60%
Direct settlement backlog sanitation population. Total population of settlement with a sanitation need (irrelevant the type of need)	62 284	60%

The total number of households in informal areas is currently estimated at 21 573 households. The table below gives a summary of the communal services levels in the informal areas in Theewaterskloof Municipality's Management Area.

Table A.2.14: Communal service levels in informal areas (March 2024)

Informal Settlement		Number of Households	Communal Sanitation Services				Communal Water Services			
			Number of Toilets	Households / Toilet	Backlog *		Number of Taps	Households / Tap	Backlog *	
					Households	Number of toilets to be provided			Households	Number of taps to be provided
Grabouw	Waterworks	794	46	17.3	334	34	19	41.8	319	13
	Beverly Hills	377	17	22.2	207	21	6	62.8	227	10
	Lost city	180	8	22.5	100	10	8	22.5	-	-
	Phumlani	578	17	34.0	408	41	5	115.6	453	19
	Siteview	227	10	22.7	127	13	2	113.5	177	8
	Darkside	116	8	14.5	36	4	4	29.0	16	1
	Klip Heuwel	100	3	33.3	70	7	4	25.0	-	-
	Siyanyanzela	8 297	111	74.7	7 187	719	12	691.4	7 997	320
	Kgotsong/Covid	2 615	46	56.8	2 155	216	10	261.5	2 365	95
	Marikana	560	0	-	560	56	4	140.0	460	19
	Marikana Extension	239	6	39.8	179	18	4	59.8	139	6
	Rail way	388	11	35.3	278	28	2	194.0	338	14
	Zola	495	12	41.3	375	38	3	165.0	420	17
	Iraq Service Plots	353	353	1.0	-	-	353	1.0	-	-
	Hillside Informal Settlement	98	6	16.3	38	4	1	98.0	73	3
	Hillside Hostels	155	12	12.9	35	4	1	155.0	130	6
	Sub Total	**15 572**	**666**	**23.4**	**12 089**	**1 213**	**438**	**35.6**	**13 114**	**531**
Bot River	New France	131	5	26.2	81	9	3	43.7	56	3
	Beaumont TRA	224	111	2.0	-	-	112	2.0	-	-
	Sub Total	**355**	**116**	**3.1**	**81**	**9**	**115**	**3.1**	**56**	**3**
Genadendal / Greyton	Genadendal	5	0	-	5	1	0	-	5	1
	Greyton - Madiba Park	198	5	39.6	148	15	2	99.0	148	6
	Beriaville	25	3	8.3	-	-	1	25.0	-	-
	Voorstekraal	0	0	-	-	-	0	-	-	-
	Sub Total	**228**	**8**	**28.5**	**153**	**16**	**3**	**76.0**	**153**	**7**
Villiersdorp	Poekom	405	51	7.9	-	-	17	23.8	-	-

Table A.2.14: Communal service levels in informal areas (March 2024)										
Informal Settlement		Number of Households	Communal Sanitation Services				Communal Water Services			
			Number of Toilets	Households / Toilet	Backlog *		Number of Taps	Households / Tap	Backlog *	
					Households	Number of toilets to be provided			Households	Number of taps to be provided
	Enkanini	632	0	-	632	64	0	-	632	26
	Nature Garden	123	0	-	123	13	0	-	123	5
	Goniwe Park	579	115	5.0	-	-	5	115.8	454	19
	Westside	281	28	10.0	1	1	4	70.3	181	8
	Lower westside	211	0	-	211	22	0	-	211	9
	Bergendal	212	180	1.2	-	-	183	1.2	-	-
	Protea Heights Vp	188	45	4.2	-	-	188	1.0	-	-
	Protea Heights Block D	104	6	17.3	44	5	5	20.8	-	-
	Deswest	388	0	-	388	39	0	-	388	16
	Protea Heights PX	282	0	-	282	29	0	-	282	12
	Protea Heights DX/DE	516	0	-	516	52	0	-	516	21
	Destiny Farm FootPrint	141	0	-	141	15	0	-	141	6
	Sub Total	**4 062**	**425**	**9.6**	**2 338**	**240**	**402**	**10.1**	**2 928**	**122**
Caledon	Riemvasmaak	**1 214**	**27**	**45.0**	**944**	**95**	**20**	**60.7**	**714**	**29**
Riviersonderend	Joe Slovo	117	14	8.4	-	-	117	1.0	-	-
	New Serviced Plots	25	25	1.0	-	-	25	1.0	-	-
	Sub Total	**142**	**39**	**3.6**	**-**	**-**	**142**	**1.0**	**-**	**-**
Total		**21 573**	**1 281**	**16.8**	**15 605**	**1 573**	**1 120**	**19.3**	**16 965**	**692**

Notes: No communal services, Ratio of communal services not adequate hh/tap > 25 and hh/toilet > 10, Adequate communal services hh/tap ≤ 25 and hh/toilet ≤ 10

* Backlog: Sanitation: Households where the ratio of one communal toilet for every 10 households is exceeded. Water: Households where the ratio of one communal tap for every 25 households is exceeded.

The number of billed metered consumers in each user sector, for the various distribution systems in Theewaterskloof Municipality's Management Area, is included in the table below for the various financial years.

Table A.2.15: Number of billed metered consumers in each user sector for the last six financial years

Distribution System	Year	Residential	Commercial	Industrial	Municipal and Other	Farms	Pre-Paid Water Meters	Total
Grabouw	2018/2019	2 939	132	1	19	5	2 585	5 681
	2019/2020	3 025	132	1	22	5	2 467	5 652
	2020/2021	3 062	125	1	16	5	2 465	5 674
	2021/2022	3 264	126	1	17	5	2 130	5 543
	2022/2023	3 646	123	1	12	5	1 688	5 475
	2023/2024	4 176	127	0	14	5	1 357	5 679
Bot River	2018/2019	1 254	21	0	1	2	522	1 800
	2019/2020	1 239	22	0	3	2	1	1 267
	2020/2021	1 199	18	0	4	2	0	1 223
	2021/2022	1 237	19	0	4	2	0	1 262
	2022/2023	1 254	19	0	4	2	0	1 279
	2023/2024	1 271	20	0	4	2	0	1 297
Villiersdorp	2018/2019	1 494	125	0	23	0	117	1 759
	2019/2020	1 476	121	0	25	0	0	1 622
	2020/2021	1 481	118	0	26	0	0	1 625
	2021/2022	1 493	120	0	27	0	3	1 643
	2022/2023	1 498	119	0	26	0	4	1 647
	2023/2024	1 491	120	0	25	0	0	1 636
Caledon	2018/2019	2 080	185	1	17	6	665	2 954
	2019/2020	2 178	186	1	22	6	514	2 907
	2020/2021	2 212	179	1	21	6	512	2 931
	2021/2022	2 302	179	1	23	6	291	2 802
	2022/2023	2 533	184	1	17	6	143	2 884
	2023/2024	2 590	190	1	16	6	96	2 899
Greater Genadendal	2018/2019	629	8	0	2	0	949	1 588
	2019/2020	620	8	0	2	0	827	1 457
	2020/2021	620	9	0	2	0	827	1 458
	2021/2022	680	9	0	2	0	725	1 416
	2022/2023	784	10	0	2	0	492	1 288
	2023/2024	999	11	0	2	0	403	1 415
Greyton	2018/2019	600	63	0	3	0	171	837
	2019/2020	616	62	0	3	0	139	820
	2020/2021	614	59	0	2	0	139	814
	2021/2022	644	60	0	2	0	104	810
	2022/2023	673	61	0	2	0	16	752
	2023/2024	748	63	0	2	0	8	821
Riviersonderend	2018/2019	950	51	0	11	0	393	1 405
	2019/2020	1 010	49	0	12	0	135	1 206
	2020/2021	1 022	46	0	10	0	135	1 213
	2021/2022	1 044	48	0	11	0	44	1 147
	2022/2023	1 132	50	0	11	0	19	1 212
	2023/2024	1 141	48	0	10	0	3	1 202
Tesselaarsdal	2018/2019	90	0	0	3	185	2	280
	2019/2020	84	0	0	3	185	1	273
	2020/2021	86	0	0	2	185	0	273
	2021/2022	87	0	0	2	185	0	274
	2022/2023	84	0	0	3	185	0	272

Table A.2.15: Number of billed metered consumers in each user sector for the last six financial years								
Distribution System	**Year**	**Residential**	**Commercial**	**Industrial**	**Municipal and Other**	**Farms**	**Pre-Paid Water Meters**	**Total**
	2023/2024	80	0	0	2	185	0	267
Rural	2018/2019	151	4	0	0	0	0	155
	2019/2020	141	4	0	0	0	0	145
	2020/2021	146	5	0	1	0	0	152
	2021/2022	147	4	0	1	0	0	152
	2022/2023	153	5	0	1	0	0	159
	2023/2024	146	4	0	1	0	0	151
Totals	**2018/2019**	**10 187**	**589**	**2**	**79**	**198**	**5 404**	**16 459**
	2019/2020	**10 389**	**584**	**2**	**92**	**198**	**4 084**	**15 349**
	2020/2021	**10 442**	**559**	**2**	**84**	**198**	**4 078**	**15 363**
	2021/2022	**10 898**	**565**	**2**	**89**	**198**	**3 297**	**15 049**
	2022/2023	**11 757**	**571**	**2**	**78**	**198**	**2 362**	**14 968**
	2023/2024	**12 642**	**583**	**1**	**76**	**198**	**1 867**	**15 367**

The total number of billed metered consumers per water distribution system and the average annual growth percentages over the period 2018/2019 to 2023/2024 are indicated in the table below.

Table A.2.16: Total number of Billed Metered Consumers per water distribution system and annual percentage of growth over the period 2018/2019 to 2023/2024							
Distribution System	**Annual Growth % 18/19 – 23/24**	**18/19**	**19/20**	**20/21**	**21/22**	**22/23**	**23/24**
Bot River	-6.34%	1 800	1 267	1 223	1 262	1 279	1 297
Caledon	-0.38%	2 954	2 907	2 931	2 802	2 884	2 899
Genadendal	-2.28%	1 588	1 457	1 458	1 416	1 288	1 415
Greyton	-0.39%	837	820	814	810	752	821
Grabouw	-0.01%	5 681	5 652	5 674	5 543	5 475	5 679
Riviersonderend	-3.07%	1 405	1 206	1 213	1 147	1 212	1 202
Tesselaarsdal	-0.95%	280	273	273	274	272	267
Villiersdorp	-1.44%	1 759	1 622	1 625	1 643	1 647	1 636
Rural	-0.52%	155	145	152	152	159	151
Total	**-1.36%**	**16 459**	**15 349**	**15 363**	**15 049**	**14 968**	**15 367**

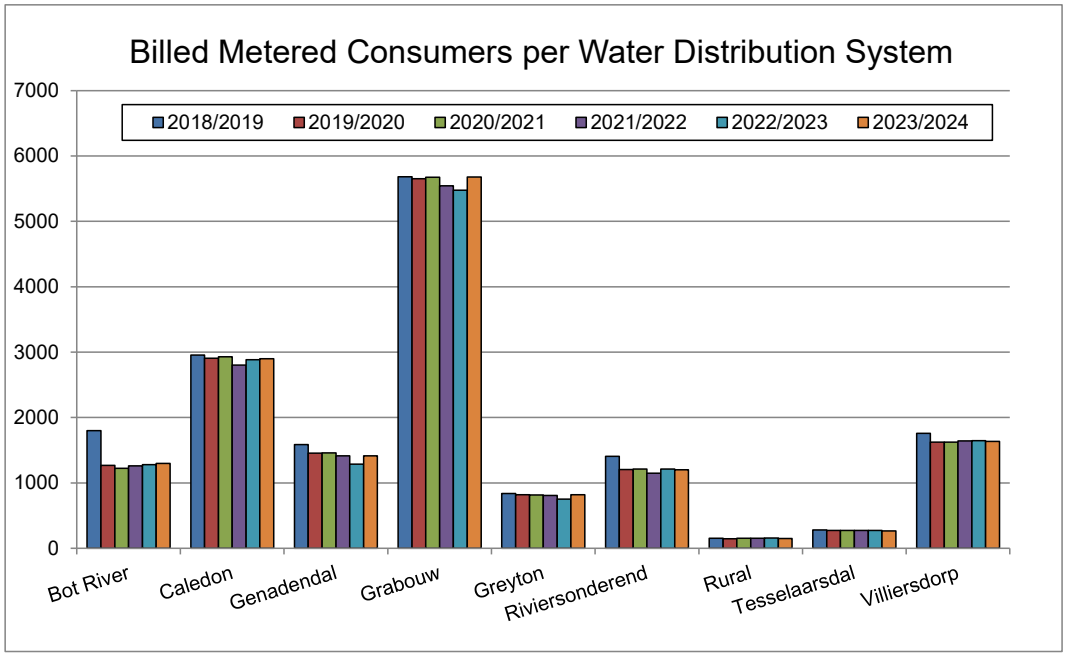


Figure A.2.3: Number of Billed Metered Consumption Units per System for the Last Six Financial Years

Public Amenities

The water service levels of the health and education facilities in Theewaterskloof Municipality's Management Area are indicated in the table below.

Table A.2.17: Education and health facilities water services					
Associated services facility	**Number of facilities**	**Facilities with adequate services**	**Facilities with no services**	**Facilities with inadequate services**	**Total potential cost (basic level) (RM)**
Education Plan					
Primary school	28	16	12 (To be verified)	0	Unknown
Secondary school	7	7	0	0	-
Combined	3	3	0	0	-
Special needs	0	0	0	0	-
Other	0	0	0	0	-
Total	**38**	**26**	**12 (To be verified)**		**Unknown**
Health Plan					
Hospitals	1	1	0	0	-
Health Centers	4	4	0	0	-
Clinics	8	8	0	0	-
Satellite Clinic	2	2	0	0	-
Total	**15**	**15**	**0**	**0**	**-**

All the schools and Community Learning Centres in the urban areas are supplied with higher levels of water services**. The water service levels of the primary schools in the rural areas need to be verified.** All the hospitals and clinics in the urban areas receive potable water through the reticulation networks of the various towns.

The sanitation service levels of the health and education facilities in Theewaterskloof Municipality's Management Area are indicated in the table below.

Table A.2.18: Education and health facilities sanitation services					
Associated services facility	**Number of facilities**	**Facilities with adequate services**	**Facilities with no services**	**Facilities with inadequate services**	**Total potential cost (basic level) (RM)**
Education Plan					
Primary school	28	16	12 (To be verified)	0	Unknown
Secondary school	7	7	0	0	-
Combined	3	3	0	0	-
Special needs	0	0	0	0	-
Other	0	0	0	0	-
Total	**38**	**26**	**12 (To be verified)**	**0**	**Unknown**
Health Plan					
Hospitals	1	1	0	0	-
Health Centers	4	4	0	0	-
Clinics	8	8	0	0	-
Satellite Clinic	2	2	0	0	-
Total	**15**	**15**	**0**	**0**	**-**

All the schools and Community Learning Centres in the urban areas are supplied with higher levels of sanitation services. **The sanitation service levels of the primary schools in the rural areas need to be verified.** All the hospitals and clinics in the urban areas are supplied with higher levels of sanitation services and are connected to the waterborne sewer systems or make use of septic tanks / conservancy tanks.

TOPIC 3: WATER SERVICES ASSET MANAGEMENT

Table A.3.1: Infrastructure Components										
Assets	**Boreholes**	**Abstraction Points**	**WTW**	**Water Pump Stations**	**Sewer Pump Stations**	**Water Pipelines**	**Sewer Pipelines**	**Reservoirs**	**WWTW**	**Assessment Score**
Total number of components / km of pipeline / units	14	12	10	23	14	369.992	241.553	39	8	80%

The table below gives an overview of the resources and the WTWs and treatment processes for the various water distribution systems in Theewaterskloof Municipality's Management Area.

Table A.3.2: Summary of existing water resources and WTWs		
Water Distribution System	**Bulk Supply (Resources)**	**Treatment Processes**
Bot River	4 x Boreholes	Bot River WTW (pH adjustment, lime stabilisation and disinfection with Sodium Hypochlorite)
Caledon	RWWSS (Overberg Water), 2 x Boreholes and Bazil Newmark Dam	Two Package Plants for groundwater and water from Bazil Newmark dam (Aeration, pH adjustment, coagulation, course screening, ultrafiltration, disinfection and stabilization)
Genadendal	Baviaans River	Genadendal WTW (Slow sand filters and disinfection Chlorine Gas)
Voorstekraal	Mountain stream and one borehole	Package plant (Aeration, pH adjustment, coagulation, course screening, ultrafiltration, disinfection and stabilization)
Bereaville	Mountain stream	Bereaville Package plant (Aeration, pH adjustment, coagulation, course screening, ultrafiltration, disinfection and stabilization)
Greyton and Boschmanskloof	Wolwekloof and Gobos River (Boesmanskloof), Gobos River borehole and Boschmanskloof mountain stream.	Greyton Package plant (Aeration, pH adjustment, coagulation, course screening, ultrafiltration, disinfection and stabilization) Greyton WTW (Slow sand filter and disinfection Sodium Hypochlorite) Boschmanskloof WTW (Disinfection with Sodium Hypochlorite or HTH Granular)
Grabouw	Eikenhof Dam (Groenland WUA)	Grabouw WTW (Chemical dosing, rapid mixing, flocculation, clarification, filtration and disinfection Chlorine Gas)
Riviersonderend	Riviersonderend River, Olifantsbos and one production borehole	Riviersonderend WTW (Sudfloc dosing, settling and filtration {two rapid gravity sand filters} and disinfection Chlorine Gas)
Tesselaarsdal	Tesselaarsdal Borehole. Bethoeskloof Borehole (Dry) and Tesselaarsdal mountain stream not in use anymore.	Tesselaarsdal WTW (Disinfection with Sodium Hypochlorite or HTH floaters)
Villiersdorp	Elandskloof Government Water Scheme, Kommissiekraal River and 5 x Boreholes	Villiersdorp new WTW under construction (Lime stabilisation, filtration {one rapid gravity sand filter) and disinfection chlorine gas)

The existing water reticulation networks, water pump stations and reservoirs are summarised in the table below for each of the water distribution systems.

Table A.3.3: Summary of existing bulk and reticulation water networks, water pump stations and reservoirs						
Water Distribution System	**Bulk and Reticulation Networks**		**Water PS**		**Reservoirs and Water Towers**	
			Raw Water	**Potable Water**	**Reservoirs and Towers**	**Total Storage**
	Bulk (m)	**Reticulation (m)**	**Number**	**Number**	**Number**	**Ml**
Bot River	2 744	25 872	-	1	4	3.681 Ml
Caledon	18 629	70 914	-	3	9	13.941 Ml
Genadendal	4 700	56 962	1	1	1	1.840 Ml
Voorstekraal			-	-	1	0.075 Ml
Bereaville			-	-	2	0.300 Ml

Table A.3.3: Summary of existing bulk and reticulation water networks, water pump stations and reservoirs						
Water Distribution System	Bulk and Reticulation Networks		Water PS		Reservoirs and Water Towers	
			Raw Water	Potable Water	Reservoirs and Towers	Total Storage
	Bulk (m)	Reticulation (m)	Number	Number	Number	Ml
Greyton and Boschmanskloof			2	2	4	2.600 Ml
Grabouw	19 416	80 401	1	5	8	17.240 Ml
Riviersonderend	5 333	27 848	2	-	2	3.300 Ml
Tesselaarsdal	32	17 834	-	1	2	0.346 Ml
Villiersdorp	4 730	34 577	-	4	6	6.355 Ml

The table below gives an overview of the major sewerage infrastructure components, for the various sewer drainage systems, in Theewaterskloof Municipality's Management Area.

Table A.3.4: Existing sewerage Infrastructure						
Sewer Drainage Systems	WWTWs and Treatment Processes			Sewer Drainage Network		Number of Sewer PS
	Hydraulic Capacity	Organic Capacity	Type of WWTW	Rising	Gravity	
	Ml/d	kg COD/d		m	m	
Bot River	1.050	1 139	Activated Sludge	834	13 367	1
Caledon	4.000	5 433	Activated Sludge and BNR	-	61 423	-
Genadendal	0.720	1 025	Activated Sludge	3 084	34 045	4
Voorstekraal	-	-	-			1
Bereaville	-	-	-			-
Greyton	0.500	635	Activated Sludge and BNR			-
Grabouw	8.500	7 192	Activated Sludge and BNR	3 133	75 629	3
Riviersonderend	0.700	Unknown	Oxidation Ponds	1 517	20 857	4
Tesselaarsdal	0.043	39.6	Package Plant	-	693	-
Villiersdorp	2.500	2 125	Activated Sludge and BNR	42	26 930	1

Table A.3.5: Refurbishment Need and O&M Occurrence												
Component	Refurbishment Need				O&M Occurrence				Observation			
	High	Medium	Low	None	Regular	Periodic	Sporadic	None	Dysfunctional	Operational	Prime Condition	Vandalised
Boreholes	4	0	8	2	0	0	14	0	4	8	0	0
Abstraction points	0	7	3	2	0	0	12	0	0	12	0	0
Bulk water pipelines	0	0	10	0	0	0	10	0	0	10	0	0
Reservoirs	5	7	16	12	0	0	40	0	1	36	3	0
Water pump stations	0	7	9	7	0	0	23	0	1	14	7	1
WTW	0	3	7	0	0	0	10	0	1	9	0	0
Bulk sewer pipelines	0	0	8	0	0	0	8	0	0	8	0	0
Sewer pump stations	1	2	11	0	0	0	14	0	1	13	0	0
WWTW	0	4	3	1	0	0	8	0	0	7	1	0

Asset Management: Theewaterskloof Municipality have a centralised Asset Management Unit based in Caledon. The persons responsible for the management of the assets of the municipality, including the safeguarding and the maintenance of those assets are as follows:

- The Municipal Manager is responsible for the management of the assets of the municipality, including the safeguarding and the maintenance of those assets. See the Asset Management Policy for the responsibilities of the Municipal Manager with regard to the assets.
- The CFO is responsible to the Municipal Manager to ensure that the financial investment in the municipalities' assets is properly recorded. See the Asset Management Policy for the responsibilities of the CFO with regard to the assets.
- The CFO may delegate or otherwise assign responsibility for performing these functions, but will remain ultimately accountable for ensuring these activities are performed.
- The Directors must all take reasonable steps to ensure that:
  - Appropriate systems of physical management and controls are established and carried out for assets in their areas of responsibility;
  - The municipal resources assigned to them are utilized effectively, efficiently, economically and transparently;
  - The assets under their control are appropriately safeguarded and maintained to the extent necessary and that risk management systems are in place and applied;
  - In the instance where moveable assets is not accounted for, after a verification process is completed, this will be regarded as misconduct and must be reported to the Human Resource department. It may be dealt with in terms of the Financial Misconduct Regulations and or the Disciplinary Procedure Collective Agreement.
  - Any unauthorised, irregular or fruitless or wasteful expenditure, and losses resulting from criminal or negligent conduct, are detected, prevented and investigated;
  - The asset management systems and controls can provide an accurate, reliable and up to date record of assets under their control;
  - They can justify that their asset plans, budgets, purchasing, maintenance and disposal decisions optimally achieve the municipality's strategic objectives.
  - The purchase of assets complies with all municipal policies and procedures, including the procurement of items from the correct budget allocation.
  - The contribution (donation) of assets communicated with the Asset Department in writing and ensure that it is included in the budget.
  - All moveable property, plant and equipment is duly processed and identified and inspected as being in order before it is received into their stewardship.
  - All moveable assets received into their stewardship are appropriately safeguarded against inappropriate use or loss. This will include the control over the physical access to these assets and regular verification to ensure that no losses have occurred. Any known losses should be immediately reported to the CFO.
  - Assets are appropriately utilized for the purpose for which the municipality acquired them.
  - Report any lost, stolen and damaged assets in line with the insurance SOP and policy.
- The Directors may delegate or otherwise assign responsibility for performing these functions, but will remain ultimately accountable for ensuring these activities are performed.

Water Infrastructure: The tables and graphs below give an overview of the water and sewerage infrastructure included in Theewaterskloof Municipality's Asset Register for the end of June 2024.

Water Infrastructure: The opening cost and carrying value of the water infrastructure included in Theewaterskloof Municipality's Asset Register is summarised in the table below (June 2024).

Table A.3.6: Opening Cost and Carrying Value of the water infrastructure (June 2024)			
Asset Type	**Opening Cost**	**Carrying Value**	**% CV / OC**
Boreholes	R5 830 480	R3 709 926	63.63%
Bulk Water Pipeline	R24 209 969	R23 816 479	98.37%
Reticulation Pipeline	R87 304 311	R68 227 034	78.15%
Reservoir	R38 644 488	R30 173 682	78.08%
Pump Station	R27 704 653	R18 241 691	65.84%
Grabouw WTW	R18 201 919	R14 122 829	77.59%
Bot River WTW	R4 406 665	R4 406 353	99.99%
Caledon WTW	R9 273 172	R5 895 499	63.58%
Bereaville WTW	R2 144 816	R1 314 366	61.28%
Greyton WTW	R1 999 763	R1 084 318	54.22%
Genadendal WTW	R3 528 256	R2 510 836	71.16%
Villiersdorp WTW	R5 799 929	R4 864 323	83.87%
Riviersonderend WTW	R186 586	R56 467	30.26%
Dams and Weirs	R3 853 987	R1 650 312	42.82%
Consumer Connections	R32 539 711	R18 334 621	56.35%
Total	**R265 628 705**	**R198 408 736**	**74.69%**

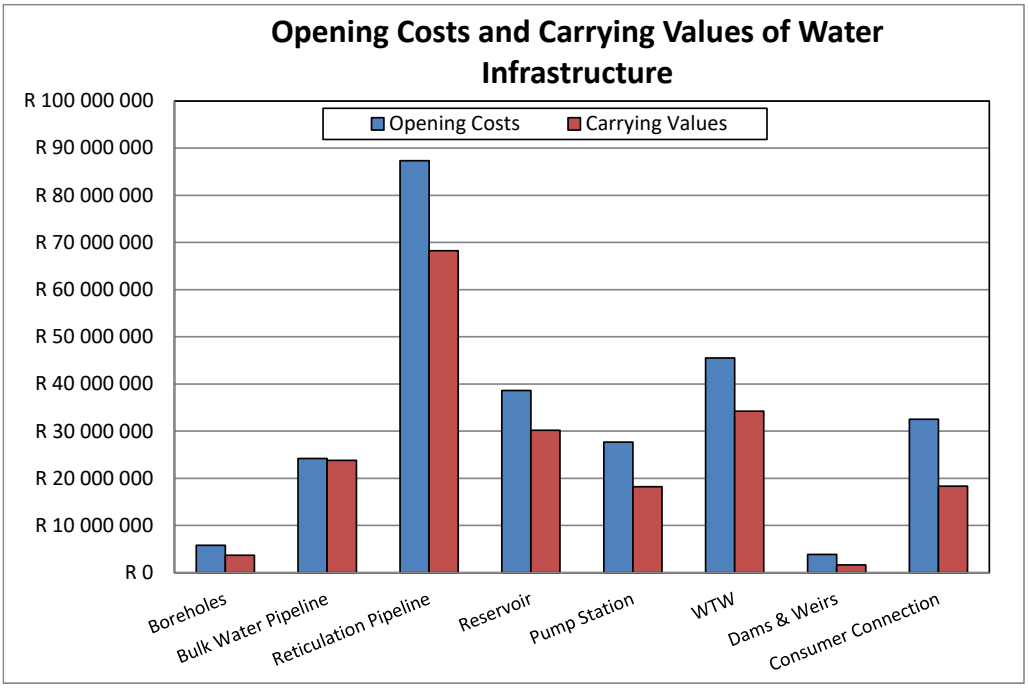


Figure A.3.1: Opening Costs and Carrying Values of the Water Infrastructure

The above table means that 25.31% of the value of the water infrastructure has been consumed.

The table and graph below give an overview of the RUL by facility type for the water infrastructure (OC).

Table A.3.7: Overview of the RUL by facility type for the water infrastructure – June 2024 (OC)					
Asset Type	**0 – 5 yrs**	**6 – 10 yrs**	**11 – 15 yrs**	**16 – 20 yrs**	**> 20 yrs**
Boreholes	R2 162 443	R461 927	R462 016	R92 888	R2 651 206
Bulk Water Pipeline	R76 381	R3 308	R206 626	R0	R23 923 654
Reticulation Pipeline	R854 930	R16 509 503	R14 039 699	R977 178	R54 923 001
Reservoir	R1 259 746	R4 987 844	R555 350	R115 024	R31 726 524
Pump Station	R9 612 048	R839 639	R6 934 438	R2 424 544	R7 893 984
Grabouw WTW	R1 694 904	R0	R0	R0	R16 507 015
Bot River WTW	R0	R0	R0	R0	R4 406 665
Caledon WTW	R0	R6 193 169	R2 973 523	R0	R106 480
Bereaville WTW	R0	R2 031 866	R0	R0	R112 950
Greyton WTW	R1 172 920	R0	R28 836	R55 887	R742 120
Genadendal WTW	R1 550 880	R1 532	R0	R0	R1 975 844
Villiersdorp WTW	R0	R0	R5 509 968	R0	R289 961
Riviersonderend WTW	R120 901	R2 627	R14 776	R0	R48 282
Dams and Weirs	R59 345	R35 462	R0	R0	R3 759 180
Consumer Connections	R7 091 658	R3 229 446	R16 418 684	R3 138 503	R2 661 420
Total	**R25 656 156**	**R34 296 323**	**R47 143 916**	**R6 804 024**	**R151 728 286**

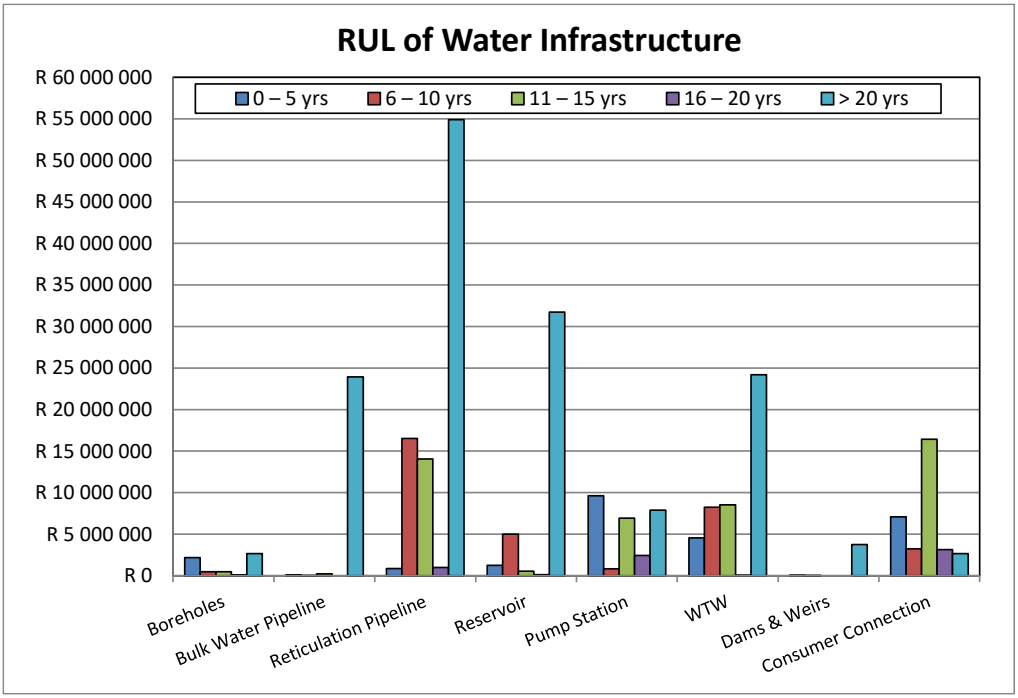


Figure A.3.2: Remaining Useful Life of the Water Infrastructure

The table and graph below give an overview of the age distribution by facility type for the water infrastructure (OC).

Table A.3.8: Overview of the age distribution by facility type for the water infrastructure – June 2024 (OC)					
Asset Type	**0 – 5 yrs**	**6 – 10 yrs**	**11 – 15 yrs**	**16 – 20 yrs**	**> 20 yrs**
Boreholes	R3 117 972	R201 805	R1 002 260	R222 800	R1 285 643
Bulk Water Pipeline	R22 770 706	R180 522	R1 258 741	R0	R0
Reticulation Pipeline	R28 994 074	R24 343 141	R13 392 132	R6 529 993	R14 044 971
Reservoir	R14 160	R18 977 061	R12 161 844	R5 508 102	R1 983 321
Pump Station	R9 994 509	R301 357	R13 289 839	R3 424 866	R694 082
Grabouw WTW	R0	R0	R15 807 049	R0	R2 394 870

Table A.3.8: Overview of the age distribution by facility type for the water infrastructure – June 2024 (OC)					
Asset Type	**0 – 5 yrs**	**6 – 10 yrs**	**11 – 15 yrs**	**16 – 20 yrs**	**> 20 yrs**
Bot River WTW	R4 406 665	R0	R0	R0	R0
Caledon WTW	R0	R9 273 172	R0	R0	R0
Bereaville WTW	R14 240	R2 130 576	R0	R0	R0
Greyton WTW	R162 859	R0	R0	R1 757 151	R79 753
Genadendal WTW	R28 481	R1 940 881	R0	R1 231 935	R326 959
Villiersdorp WTW	R5 799 929	R0	R0	R0	R0
Riviersonderend WTW	R0	R0	R0	R98 911	R87 675
Dams and Weirs	R0	R0	R0	R16 963	R3 837 024
Consumer Connections	R12 759 130	R2 764 641	R6 730 724	R0	R10 285 216
Total	**R88 062 725**	**R60 113 156**	**R63 642 589**	**R18 790 721**	**R35 019 514**

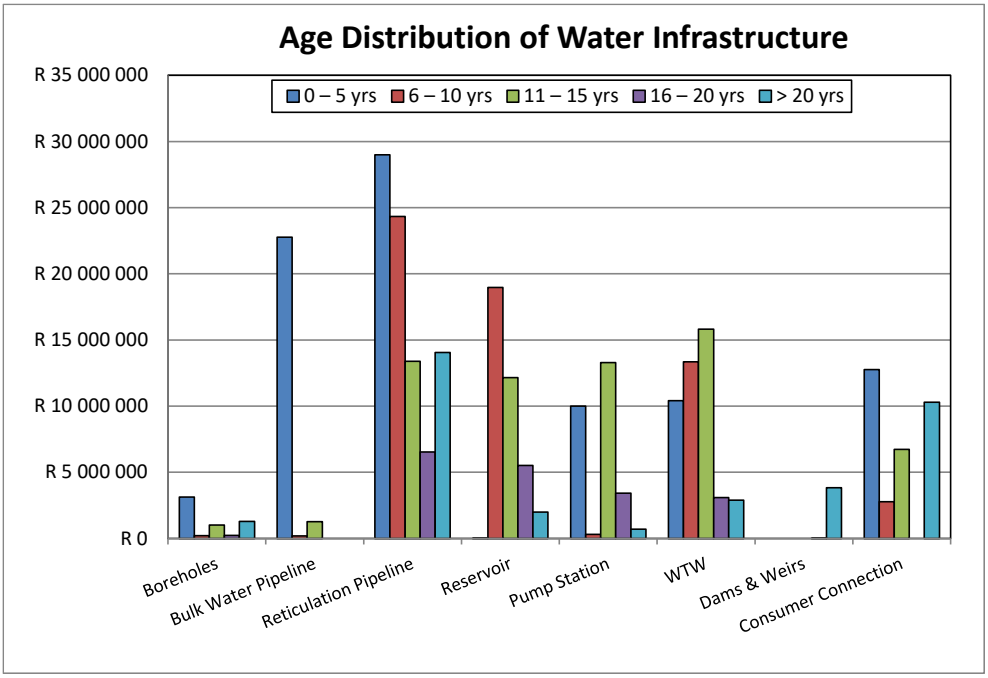


Figure A.3.3: Age Distribution of the Water Infrastructure

The asset renewal needs for the water infrastructure assets over the next ten years is R5.995 million per year. The reinvestment required is R25.656 million in the first five years and R34.296 million in the second five-year period. The age of 13.18% of the water infrastructure assets is greater than twenty years.

Sewerage Infrastructure: The opening cost and carrying value of the sewerage infrastructure included in Theewaterskloof Municipality's Asset Register is summarised in the table below (June 2024).

Table A.3.9: Opening Cost and Carrying Value of the sewerage infrastructure (June 2024)			
Asset Type	**Opening Cost**	**Carrying Value**	**% CV / OC**
Sewer Reticulation Pipelines	R146 003 306	R124 998 782	85.61%
Sewer Pump Stations	R7 176 148	R5 529 031	77.05%
Genadendal WWTW	R6 915 454	R5 285 155	76.43%
Greyton WWTW	R26 763 695	R25 582 214	95.59%
Caledon WWTW	R66 858 222	R61 470 380	91.94%
Bot River WWTW	R7 245 975	R5 351 211	73.85%
Riviersonderend WWTW	R755 852	R557 653	73.78%
Villiersdorp WWTW	R27 644 646	R21 824 693	78.95%
Grabouw WWTW	R55 602 349	R32 482 534	58.42%
Tesselaarsdal WWTW	R798 004	R262 282	32.87%
Totals	**R345 763 651**	**R283 343 935**	**81.95%**

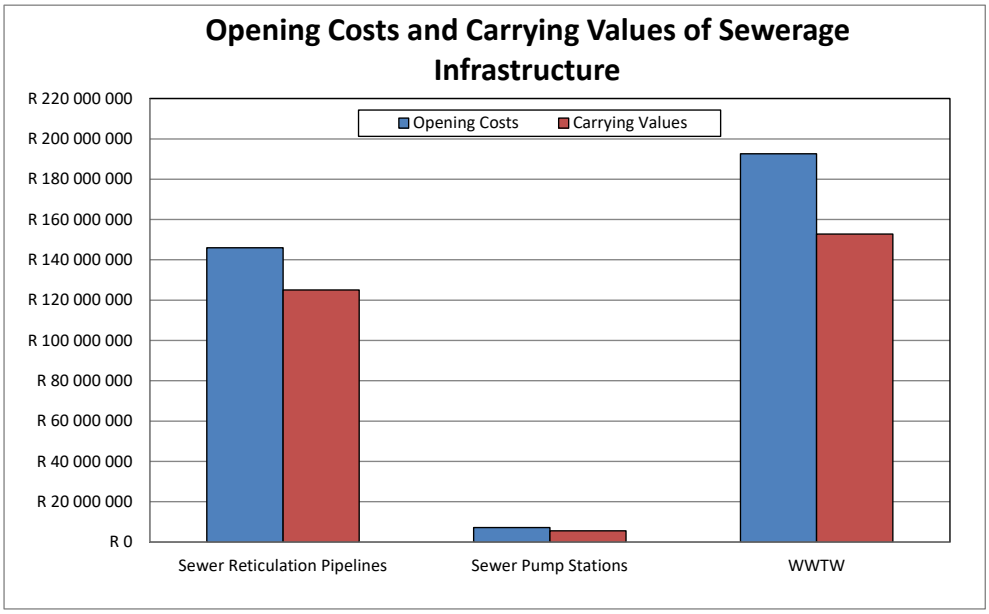


Figure A.3.4: Opening Cost and Carrying Values of the Sewerage Infrastructure

The previous table indicates that 18.05% of the value of the sewerage infrastructure has been consumed.

The table and graph below give an overview of the RUL by facility type for the sewerage infrastructure (OC).

Table A.3.10: Overview of the RUL by facility type for the sewerage infrastructure – June 2024 (OC)

Asset Type	0 – 5 yrs	6 – 10 yrs	11 – 15 yrs	16 – 20 yrs	> 20 yrs
Sewer Reticulation Pipelines	R325 628	R3 790 049	R5 321 354	R1 391 249	R135 175 026
Sewer Pump Stations	R1 389 818	R547 935	R361 022	R92 935	R4 784 438
Genadendal WWTW	R1 323 387	R152 623	R22 528	R0	R5 416 916
Greyton WWTW	R9 010	R7 364	R12 230 163	R388 617	R14 128 541
Caledon WWTW	R3 464 084	R4 522	R30 079 937	R1 112 619	R32 197 060
Bot River WWTW	R3 115 156	R15 840	R123 333	R0	R3 991 646
Riviersonderend WWTW	R90 036	R1 656	R0	R467 049	R197 111
Villiersdorp WWTW	R237 211	R1 586 496	R3 171 161	R3 689 406	R18 960 372
Grabouw WWTW	R15 886 107	R15 320 413	R0	R952 244	R23 443 585
Tesselaarsdal WWTW	R798 004	R0	R0	R0	R0
Totals	**R26 638 441**	**R21 426 898**	**R51 309 498**	**R8 094 119**	**R238 294 695**

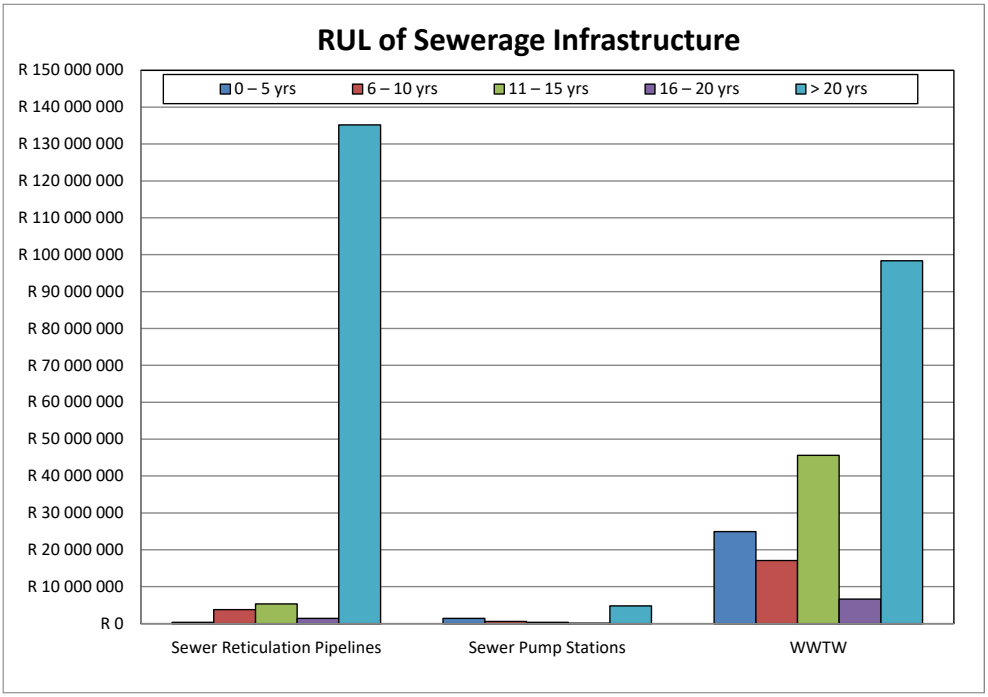


Figure A.3.5: Remaining Useful Life of the Sewerage Infrastructure

The table and graph below give an overview of the age distribution by facility type for the sewerage infrastructure (OC).

Table A.3.11: Overview of the age distribution by facility type for the sewerage infrastructure – June 2024 (OC)

Asset Type	0 – 5 yrs	6 – 10 yrs	11 – 15 yrs	16 – 20 yrs	> 20 yrs
Sewer Reticulation Pipelines	R46 341 135	R46 606 020	R4 152 423	R28 660 946	R20 242 782
Sewer Pump Stations	R4 610 594	R105 341	R870 077	R595 703	R994 433
Genadendal WWTW	R17 272	R0	R1 573 714	R5 324 468	R0
Greyton WWTW	R26 715 343	R0	R0	R0	R48 352
Caledon WWTW	R62 495 113	R0	R2 486 194	R833 650	R1 043 265
Bot River WWTW	R0	R15 840	R7 230 135	R0	R0
Riviersonderend WWTW	R467 049	R0	R0	R226 867	R61 936
Villiersdorp WWTW	R11 644 634	R15 466 843	R533 169	R0	R0
Grabouw WWTW	R0	R50 930 830	R0	R204 834	R4 466 685
Tesselaarsdal WWTW	R0	R0	R798 004	R0	R0
Totals	**R152 291 140**	**R113 124 874**	**R17 643 716**	**R35 846 468**	**R26 857 453**

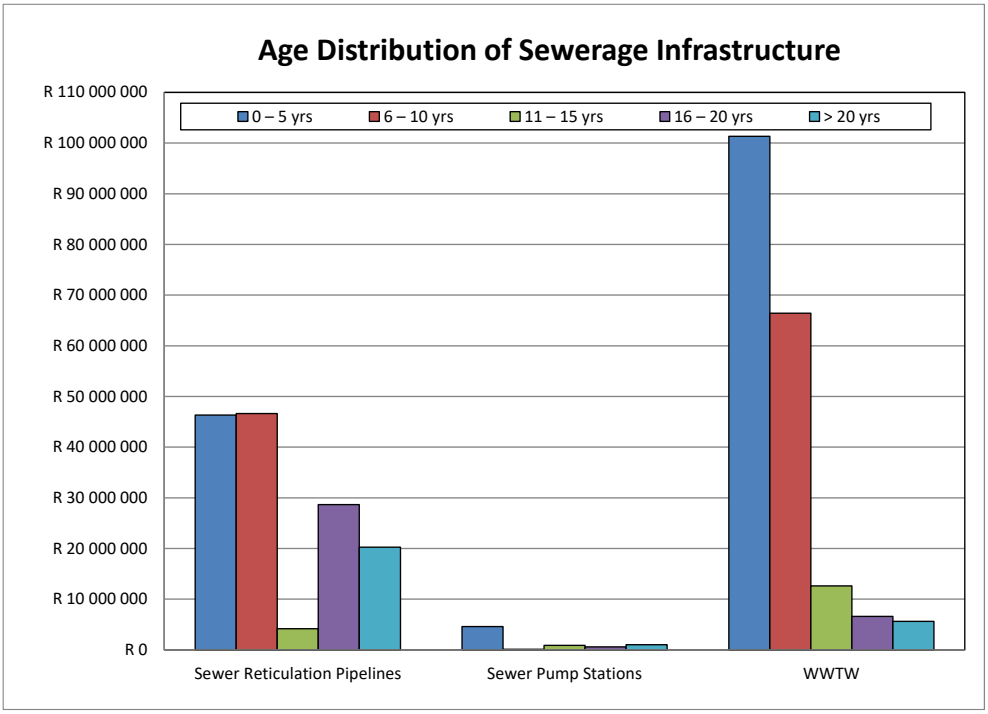


Figure A.3.6: Age Distribution of the Sewerage Infrastructure

The asset renewal needs for the sewerage infrastructure assets over the next ten years is R4.807 million per year. The reinvestment required is R26.638 million in the first five years and R21.427 million in the second five-year period. The age of 7.77% of the sewerage infrastructure assets is greater than twenty years.

Disaster Management Plan: Theewaterskloof Municipality has an approved Disaster Management Policy. Theewaterskloof Municipality has taken the disaster management option of working in conjunction with the Overberg District Municipality and making use of their infrastructure in cases of disaster management.

During disasters and incidents, the first response will come from Theewaterskloof Municipality. If such incidents or disasters are of such magnitude that the municipality can't cope, Overberg District Municipality will be activated and for that matter Province as the chain of events will occur. All incidents will be coordinated by Overberg District Municipality.

Theewaterskloof Municipality follows a structured disaster management framework based on the principles outlined in the Disaster Management Act, as approved by the Theewaterskloof Municipality Council and the National Disaster Management Framework. This framework encompasses the four phases of disaster management: Prevention, Preparedness, Response and Recovery.

Untreated Effluent Management Plan: All effluent discharged in the urban areas in Theewaterskloof Municipality are treated at the existing WWTWs and there is no known untreated effluent discharged to the environment. W_2RAPs were prepared during 2023 for all the WWTWs and sewer drainage networks.

TOPIC 4: WATER SERVICES OPERATION AND MAINTENANCE

Maintenance is usually practices in two forms, preventative maintenance and corrective maintenance. A third form is called design-out maintenance, which is rather an aspect of the design considerations when the infrastructure is planned.

Pipe bursts and other serious damage to pipes immediately interrupts services to the affected area and is rapidly addressed by Theewaterskloof Municipality. O&M is a continuous process for Theewaterskloof Municipality involving various activities, with the ultimate purpose of delivering good quality services to all customers at all times and keeping the percentage of water lost through pipe bursts and other serious damage to pipes as low as possible. Theewaterskloof Municipality's O&M Plan depends on a range of factors such as the age and condition of the water supply system, requirements of the Municipality and DWS as the regulating authority, the availability of staff, plant, equipment, spares, money and other resources.

Theewaterskloof Municipality also have standby teams available after hours and over weekends, besides the planned and scheduled O&M activities, in order to allow for unscheduled responses to service breakdowns due to mal-functioning equipment, vandalism, emergency situations, etc. This allows Theewaterskloof Municipality to be able to quickly assess service breakdowns and re-allocate staff and resources to do unscheduled repairs, and then quickly return to the regular and scheduled O&M activities. The technical personnel ensure that sufficient repair materials, consumables and back-up equipment are also readily available in a well-organised store.

Table A.4.1: Operation and Maintenance

Compliancy	Existing Groundwater Infrastructure	Existing Surface Water Infrastructure	Existing WTW Infrastructure	Existing WWTW Infrastructure	Existing Pump Station Infrastructure	Existing Bulk Pipeline Infrastructure	Existing Tower & Reservoir Infrastructure	Existing Reticulation Infrastructure
Resources	Min. requirement	Min. requirement	Min. requirement	Min. requirement	Min. requirement	Min. requirement	Min. requirement	Min. requirement
Information	Min. requirement	Min. requirement	Min. requirement	Min. requirement	Min. requirement	Min. requirement	Min. requirement	Min. requirement
Activity Control & Management	Below Min. requirement	Below Min. requirement	Min. requirement	Min. requirement	Min. requirement	Min. requirement	Min. requirement	Min. requirement

TOPIC 5: CONSERVATION AND DEMAND MANAGEMENT

Theewaterskloof Municipality's existing WC/WDM Strategy is outdated. A new 10-year Council approved WC/WDM Strategy and Annual Plan need to be developed, which comply with the WC/WDM Strategy requirements as included in the Revised Compulsory National Water and Sanitation Standards of 6 June 2025. The proposed WSDP WC/WDM Strategy is included under Topic 5 of the Future Demand and Functionality Requirements Report.

The average annual growth percentage in total raw water requirements for Theewaterskloof Municipality over the period 2010/2011 to 2023/2024 was 2.04 %/a. The NRW and water losses for all the systems combined decreased during the last financial year. The overall NRW of 2 780 Ml (47.7%) is however still extremely high and above DWS's NRW target of 30%. The overall water losses were 974 Ml (16.7%). The Municipality continue with the implementation of their WC/WDM measures.

The table below give a summary of the Treatment Losses, NRW, Water losses and ILI for the various distribution systems, as calculated through the WSDP process.

Table A.5.1: Treatment Losses, NRW, Water Losses and ILIs for the various water distribution systems

Water Distribution System	Component	Unit	Record: Prior (Ml/a)					23/24
			18/19	19/20	20/21	21/22	22/23	
Bot River	Treatment Losses	Volume	*39.186*	*43.481*	*43.922*	*53.111*	*47.610*	*43.764*
		Percentage	*15.0%*	*15.0%*	*15.0%*	*15.0%*	*15.0%*	*15.0%*
	NRW	Volume	81.231	105.404	101.928	146.032	122.168	101.202
		Percentage	36.6%	42.8%	41.0%	48.5%	45.3%	40.8%
	Water Losses	Volume	73.022	96.715	84.187	126.488	107.204	60.999
		Percentage	32.9%	39.3%	33.8%	42.0%	39.7%	24.6%
	ILI							**2.14**

Table A.5.1: Treatment Losses, NRW, Water Losses and ILIs for the various water distribution systems								
Water Distribution System	**Component**	**Unit**	**Record: Prior (Ml/a)**					**23/24**
			18/19	**19/20**	**20/21**	**21/22**	**22/23**	
Caledon	NRW	Volume	209.119	227.773	309.157	395.705	878.657	591.815
		Percentage	17.0%	18.5%	22.7%	29.0%	48.5%	38.4%
	Water Losses	Volume	172.144	205.752	265.429	360.008	838.323	495.336
		Percentage	14.0%	16.7%	19.5%	26.4%	46.2%	32.1%
	ILI							**5.37**
Greater Genadendal	NRW	Volume	217.918	114.536	108.238	53.880	179.618	159.912
		Percentage	69.9%	50.7%	47.3%	26.1%	55.4%	50.0%
	Water Losses	Volume	217.240	102.920	77.338	26.689	159.368	133.322
		Percentage	69.7%	45.5%	33.8%	12.9%	49.1%	41.7%
	ILI							**3.74**
Grabouw	Treatment Losses	Volume	*78.247*	*98.439*	*98.416*	*103.917*	*122.167*	*129.336*
		Percentage	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*
	NRW	Volume	1 042.955	1 131.707	1 109.160	1 200.088	1 519.370	1 612.144
		Percentage	61.0%	60.5%	59.3%	60.8%	65.5%	65.6%
	Water Losses	Volume	905.399	1 084.362	928.834	9 89.956	1 020.628	107.004
		Percentage	52.9%	58.0%	49.7%	50.1%	44.0%	4.4%
	ILI							**1.00**
Greyton	NRW	Volume	137.319	113.115	99.732	96.508	159.605	85.904
		Percentage	57.3%	47.7%	44.7%	43.4%	54.3%	39.0%
	Water Losses	Volume	136.840	109.390	91.147	88.827	151.062	85.464
		Percentage	57.1%	46.1%	40.8%	40.0%	51.4%	38.8%
	ILI							**4.92**
Riviersonderend	Treatment Losses	Volume	80.884	*50.057*	*61.156*	*60.385*	*51.031*	*55.188*
		Percentage	22.2%	*15.0%*	*15.0%*	*15.0%*	*15.0%*	*15.0%*
	NRW	Volume	127.544	109.814	162.806	137.176	63.120	73.470
		Percentage	45.0%	38.7%	47.0%	40.1%	21.8%	23.5%
	Water Losses	Volume	126.279	107.389	154.229	127.786	59.531	62.345
		Percentage	44.5%	37.9%	44.5%	37.3%	20.6%	19.9%
	ILI							**1.36**
Tesselaarsdal	NRW	Volume	14.711	10.762	8.414	19.222	11.074	29.705
		Percentage	25.0%	26.3%	22.5%	37.9%	25.1%	48.1%
	Water Losses	Volume	14.593	10.680	8.339	19.121	10.986	29.582
		Percentage	24.8%	26.1%	22.3%	37.7%	24.9%	47.9%
	ILI							**1.16**
Villiersdorp	NRW	Volume	177.175	0.000	103.658	90.691	177.459	125.879
		Percentage	28.7%	0.0%	18.4%	15.9%	27.6%	18.9%
	Water Losses	Volume	86.327	0.000	102.534	40.831	86.630	0.000
		Percentage	14.0%	0.0%	18.2%	7.2%	13.5%	0.0%
	ILI							**Negative**
TOTAL	**NRW**	**Volume**	**2 008.052**	**1 813.151**	**2 003.093**	**2 139.302**	**3 111.071**	**2 780.031**
		Percentage	**43.0%**	**40.0%**	**41.1%**	**42.5%**	**51.9%**	**47.7%**
	Water Losses	**Volume**	**1 731.843**	**1 717.210**	**1 712.036**	**1 779.706**	**2 433.732**	**974.051**
		Percentage	**37.1%**	**37.9%**	**35.1%**	**35.4%**	**40.6%**	**16.7%**

Notes: ILI for Developed Countries = **1 – 2 Excellent (Category A)**, **2 – 4 Good (Category B)**, **4 – 8 Poor (Category C)** and **> 8 – Very Bad (Category D)**

Category A = No specific intervention required.

Category B = No urgent action required although should be monitored carefully.

Category C = Requires attention

Category D = Requires immediate water loss reduction interventions

The Infrastructure Leakage Index (ILI) in the above table is the most recent and preferred performance indicator for comparing leakage from one system to another. It is a non-dimensional index representing the ratio of the current real leakage and the "Unavoidable Annual Real Losses". A high ILI value indicates a poor performance with large potential for improvement while a small ILI value indicates a well-managed system with less scope for improvement. Attaining an ILI = 1 is a theoretical limit, which is the minimum water loss in an operational water reticulation system. A value of less than 1 should not occur since this implies that the actual leakage is less than the theoretical minimum level of leakage.

The table below gives an overview of the System Input Volume, Average Billed Metered Consumption and NRW in litre per connection per day for the various water distribution systems for the 2023/2024 financial year.

Table A.5.2: System Input Volume, average Billed Metered Consumption and NRW in litre per connection per day for the various water distribution systems for the 2023/2024 financial year

Water Balance Component	Bot River	Caledon	Greater Genadendal	Grabouw	Greyton	Riviersonderend	Tesselaarsdal	Villiersdorp
System Input Volume	524	1 457	619	1 186	735	713	633	1 113
Average Billed Metered Cons.	309	898	309	385	447	545	328	902
Non-Revenue Water	214	559	310	778	287	167	305	211

The system with the highest system input volume is Caledon. The system with the highest average billed metered consumption per connection per day is Villiersdorp and the system with the highest NRW per connection per day is Grabouw.

Table A.5.3: Reducing Water Losses

Reducing water losses and water inefficiencies		Assessment Score
Night flow metering	Partially	40%
Day flow metering	Yes	60%
Reticulation leaks	Yes	60%
Illegal connections	Partially	60%
Un-metered connections	Partially	60%
Leak and meter repair programmes. Consumer units targeted by:		
Leak repair assistance programme	Partially	40%
Retro-fitting of water inefficient toilets	Partially	40%
Meter repair programme	Partially	60%
Consumer/end-use demand management: Public Information & Education Programmes		
Schools targeted by education programmes	No	20%
Consumers targeted by public information programmes	Yes	60%

The current WDM activities implemented by Theewaterskloof Municipality are funded through their O&M budget and there is no dedicated budget allocation for the implementation of the various WC/WDM Strategy activities. The main water demand management interventions implemented by Theewaterskloof Municipality, over the last few years are as follows:

- Customer Services and Complaints System is implemented by the Municipality (Burst pipes, etc.). Standby teams are also available after hours and over weekends for immediate repairs of bust pipes.
- Strict municipal services standards for the installation of new water reticulation networks for own and private developments.
- Reticulation material and quality standards checks.
- Meter and record all bulk water supply to the various distribution systems and improve the quality of data regarding the monthly consumer usage in order to carry out more detail IWA water balances for the various systems.
- Consumer WC/WDM education and awareness raising campaigns.
- Pressure reduction in some of the towns through the installation of PRVs.
- Stepped rising water tariff structure that promote the efficient use of water.
- Scada system to monitor and manage water usage (Reservoir levels, etc.).

DWS's scorecard for assessing the potential for WC/WDM efforts was completed for Theewaterskloof Municipality. The aim of the scorecard was to establish areas where the municipality has made good progress in relation to WC/WDM and where there is still room for improvement. It can be seen from the Scorecard that there are 25 questions each of which carries a maximum of 4 points providing a possible maximum score of 100. If the Municipality has the specific item completely under control, it receives the maximum points and if it is neglecting the item completely it receives no points. There are various levels between the maximum and the minimum number of points assigned to the municipality for each item depending on the level of

completeness or lack thereof. **The status quo score for Theewaterskloof Municipality is 69 out of 100 suggesting that the Municipality can further increase the implementation of specific WC/WDM activities to reduce the current NRW and Water Losses.**

TOPIC 6: WATER RESOURCES

The table below gives an overview of the current water resources, the current volumes abstracted and the authorised volumes.

Table A.6.1: Water Resources

Current Water Sources							
Source Type	Scheme	Number of Sources	Current 23/24 Abstraction or Returns (x 10^6 m^3/a)	Licensed Abstraction / Returns (x 10^6 m^3/a)	Community Water Supply		Assessment Score
					Rural	Urban	
Ground-water	Bot River	4	0.292	0.568 (Y)	0%	100%	60%
	Tesselaarsdal and Bethoeskloof	1	0.062	0.078 (Y)	0%	100%	60%
Surface Water	Genadendal	1	0.239	2.458 (Y)	0%	100%	60%
	Bereaville	1	0.065	0.073 (Y)	0%	100%	60%
	Riviersonderend	2	0.368	0.421 (Y)	0%	100%	60%
	Villiersdorp	2	0.782	0.624 (SLA & R)	0%	100%	60%
External Sources (Bulk Purchase)	Grabouw	1	2.587	4.420 (SLA)	0%	100%	60%
Conjunctive use	Caledon	4	1.542	2.589 (SLA & R)	0%	100%	60%
	Voorstekraal	2	0.072	0.399 (Y)	0%	100%	60%
	Greyton and Boschmanskloof	3	0.259	0.525 (Y)	0%	100%	60%
Water Returned to Source	Bot River	1	0.102	0.383	-	-	60%
	Caledon	1	0.741	1.752	-	-	60%
	Genadendal	1	0.083	Undetermined	-	-	20%
	Grabouw	1	0.962	3.103	-	-	60%
	Villiersdorp	1	0.633	0.913	-	-	60%
	Tesselaarsdal	1	0.001	Undetermined	-	-	20%

Note: Abbreviations Y = Yield, SLA = Service Level Agreement and R = WARMS Registration

The table below indicates the potential additional future water resources for Theewaterskloof Municipality.

Table A.6.2: Additional water resources and volumes

Source Type	Schemes	Number of Sources	Potential Volume (x 10^6 m^3/a)	Licensed Abstraction (Mm^3/a)
Groundwater	Bot River (2040)	2	0.210	WULA to be done
	Tesselaarsdal (2028)	1	0.086	WULA to be done
	Villiersdorp (2026)	5	0.466	0.590 (WARMS Registration)
Surface Water	Riviersonderend (2026)	1	0.496	0.360 (WARMS Registration)
Wastewater Reclamation	-	-	-	-
External Sources (Bulk Purchase)	Caledon (2040)	1	1.522	New SLA
	Grabouw (2036)	1	2.476	New SLA

Theewaterskloof Municipality has an established monitoring plan to monitor the volumes abstracted from resources and quality of the water abstracted.

Table A.6.3: Monitoring		
Monitoring	**Assessment Score**	
% of water abstracted monitored: Surface water	60%	
% of water abstracted monitored: Ground water	60%	
Monitoring	**Interval**	**Assessment Score**
Surface water levels (1: daily, 2: weekly, 3: monthly, 4: annually, 5: never)	Weekly	60%
Ground water levels (1: daily, 2: weekly, 3: monthly, 4: annually, 5: never)	Never	0%
Water quality for formal schemes? (1: daily, 2: weekly, 3: monthly, 4: annually, 5: never)	Daily, Monthly, Annually	80%
Water quality for rudimentary schemes? (1: daily, 2: weekly, 3: monthly, 4: annually, 5: never)	Monthly (Overberg DM)	60%
Borehole abstraction? (1: daily, 2: weekly, 3: monthly, 4: annually, 5: never)	Monthly	60%

Detail IWA Water Balances are available for each of the water distribution systems (towns) in Theewaterskloof Municipality's Management Area. The graph below gives an overview of the average daily raw water supply volume to all the towns.

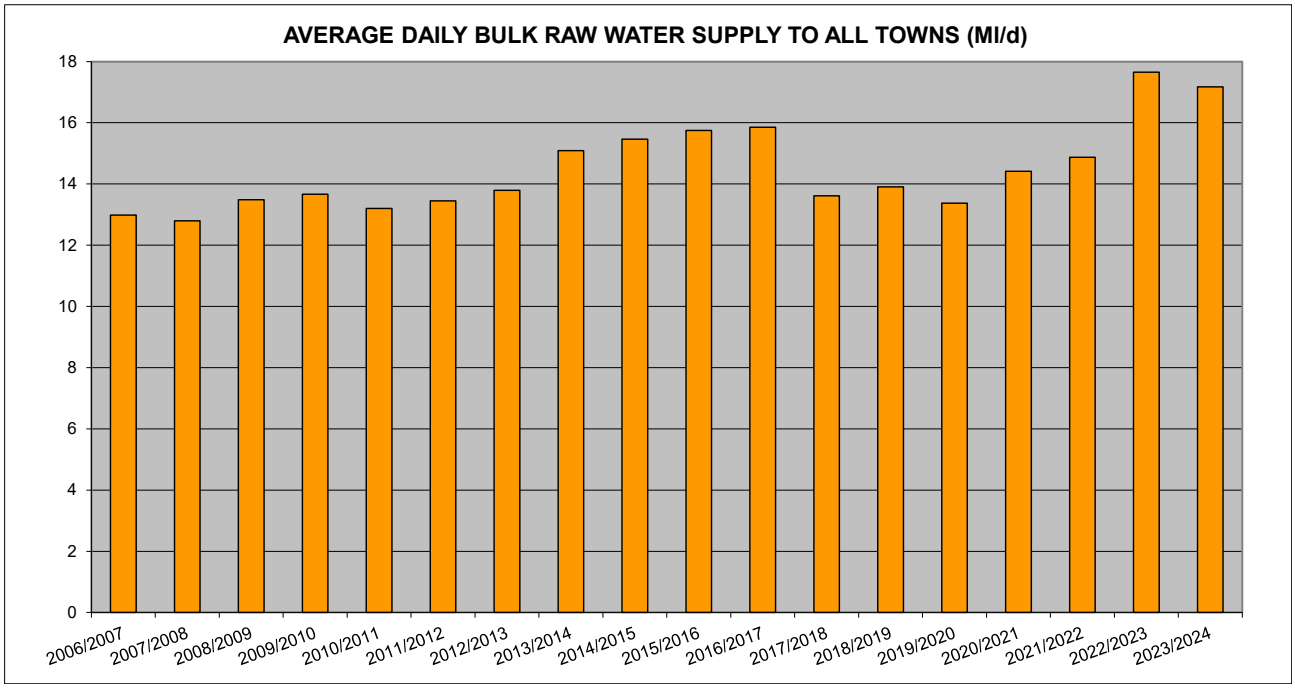


Figure A.6.1: Average Daily Bulk Raw Water Supply Volume to all Towns in Theewaterskloof Municipality

The graph below gives an indication of Theewaterskloof Municipality's total annual bulk raw water supply volumes to the various towns over the last fourteen financial years.

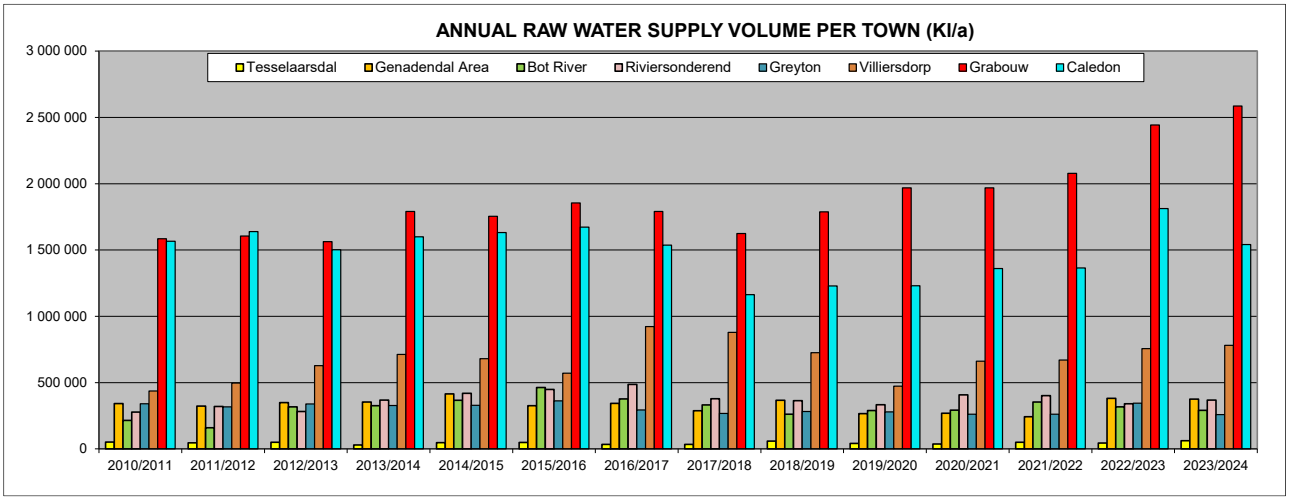


Figure A.6.2: Total Annual Raw Water Supply to the Various Towns

All water sources are supplied with bulk water meters and accurate records are kept of all bulk water meter readings. The table below gives a summary of the total annual bulk raw water supply volumes for the various towns within Theewaterskloof Municipality's Management Area.

Table A.6.4: Annual bulk raw water supply volumes for the various towns

Distribution System	Source	Record: Prior (Ml/a)					23/24
		18/19	19/20	20/21	21/22	22/23	
Bot River	Boreholes	261.240	289.872	292.816	354.070	317.400	291.761
Caledon	RWWSS (Overberg Water), Boreholes and Basil Newmark Dam	1 229.478	1 230.302	1 360.995	1 365.262	1 813.423	1 541.970
Genadendal [1)]	Baviaans River	366.711	265.898	269.173	243.260	381.513	376.079
Voorstekraal [1)]	Mountain stream and borehole						
Bereaville [1)]	Mountain stream						
Greyton and Boschmanskloof [1)]	Wolwekloof and Gobos River (Boesmanskloof) and Gobos River borehole and Boschmanskloof mountain stream	281.748	279.031	262.516	261.579	345.516	258.958
Grabouw [1)]	Eikenhof Dam (Groenland WUA)	1 788.342	1 968.790	1 968.312	2 078.340	2 443.340	2 586.717
Riviersonderend [1)]	Riviersonderend River, Olifantsbos and borehole.	364.433	333.713	407.706	402.564	340.205	367.918
Tesselaarsdal	Tesselaarsdal Borehole	58.885	40.921	37.474	50.707	44.188	61.698
Villiersdorp [1)]	Elandskloof Government Water Scheme and Kommissiekraal River	725.234	473.659	661.433	671.038	756.956	781.851
Total Raw Water Supply volume to all towns		**5 076.071**	**4 882.185**	**5 260.425**	**5 426.819**	**6 442.542**	**6 266.951**

Note: 1) Added 15% bulk distribution and treatment losses to system input volume.

Water Quality: Theewaterskloof Municipality makes use of an accredited external laboratory to conduct the drinking water compliance sampling and analysis. Samples are taken at various locations in each system and analysed to evaluate the compliance. The water quality results are loaded onto DWS's IRIS via the internet. Once entered the data is automatically compared to SANS241. This real-time system allows for immediate intervention to rectify any problems.

Theewaterskloof Municipality actively implements their Operational and Compliance Water and Wastewater Quality Sampling Programmes in order to promptly identify water and effluent quality failures and to react accordingly.

Table A.6.5: Water Quality			
Water Quality	**In place**	**Status Quo**	**Assessment Score**
Is there a Water Safety Plan in Place?	Yes	60%	60%
Reporting on quality of water taken from source: urban & rural	Yes	60%	60%
Quality of water returned to the resource: urban	Yes	60%	60%
Quality of water returned to the resource: rural	No	Not Applicable	80%
Is there a Pollution contingency measures plan in place?	Yes	60%	60%
Quality of water taken from source: urban - % monitored by WSA self?	Yes	60%	60%
Quality of water taken from source: rural - % monitored by WSA self?	No	Not Applicable	80%
Quality of water returned to the source: urban - % monitored by WSA self?	Yes	60%	60%
Quality of water returned to the source: rural - % monitored by WSA self?	No	Not Applicable	80%
Are these results available in electronic format? (Yes/no)	Yes	80%	80%
% Time (days) within SANS 241 standards per year	Yes	60%	60%
Abstraction IS registered with DWS	Yes	60%	60%
The abstraction IS NOT registered with DWS	-	-	-
The abstraction IS recorded	Yes	60%	60%
The abstraction IS NOT recorded	-	-	-

Note: The scores of 60% and 80% in the above table are Good and Excellent.

The overall percentages of compliance of the water quality samples taken over the period July to June for the 2022/2023 and 2023/2024 financial years are summarised in the table below per water distribution system. The additional monitoring required by Theewaterskloof Municipality for determinands identified during the risk assessment exceeding the SANS 241:2015 numerical limits are also included in the table.

Table A.6.6: Percentage compliance of the water quality samples for the last two financial years						
Performance Indicator	**Performance Indicator categorised as unacceptable Yes / No (Table 4 of SANS 241-2:2015)**		**% Sample Compliance according to SANS 241-2015 Limits**		**Frequency of Additional Monitoring due to failure (Table 3 of SANS 241-2:2015)**	
	22/23	**23/24**	**22/23**	**23/24**	**22/23**	**23/24**
Bot River						
Acute Health Microbiological	No (Good)	No (Excellent)	96.2%	100.0%	-	-
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Chronic Health	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Aesthetic	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Operational Efficiency	No (Excellent)	Yes (Unacceptable)	94.9%	88.4%	-	Monthly
Caledon						
Acute Health Microbiological	Yes (Unacceptable)	No (Excellent)	92.3%	100.0%	Monthly	-
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Chronic Health	No (Excellent)	No (Excellent)	99.6%	98.9%	-	-
Aesthetic	No (Excellent)	No (Excellent)	98.5%	98.0%	-	-
Operational Efficiency	Yes (Unacceptable)	Yes (Unacceptable)	78.1%	79.3%	Monthly	Monthly
Genadendal						
Acute Health Microbiological	Yes (Unacceptable)	Yes (Unacceptable)	23.0%	53.3%	Monthly	Monthly
Acute Health Chemical	No (Excellent)	-	100.0%	-	-	-
Chronic Health	No (Excellent)	No (Excellent)	100.0%	98.5%	-	-
Aesthetic	Yes (Unacceptable)	Yes (Unacceptable)	84.9%	76.0%	Quarterly	Quarterly
Operational Efficiency	Yes (Unacceptable)	Yes (Unacceptable)	50.0%	64.9%	Monthly	Monthly
Voorstekraal						
Acute Health Microbiological	Yes (Unacceptable)	Yes (Unacceptable)	64.7%	91.3%	Monthly	Monthly
Acute Health Chemical	No (Excellent)	-	100.0%	-	-	-
Chronic Health	No (Excellent)	No (Excellent)	99.2%	100.0%	-	-

Table A.6.6: Percentage compliance of the water quality samples for the last two financial years						
Performance Indicator	**Performance Indicator categorised as unacceptable Yes / No (Table 4 of SANS 241-2:2015)**		**% Sample Compliance according to SANS 241-2015 Limits**		**Frequency of Additional Monitoring due to failure (Table 3 of SANS 241-2:2015)**	
	22/23	**23/24**	**22/23**	**23/24**	**22/23**	**23/24**
Aesthetic	No (Excellent)	No (Excellent)	95.7%	98.8%	-	-
Operational Efficiency	Yes (Unacceptable)	No (Excellent)	71.9%	97.2%	Monthly	-
Bereaville						
Acute Health Microbiological	Yes (Unacceptable)	No (Good)	80.6%	95.5%	Monthly	-
Acute Health Chemical	No (Excellent)	-	100.0%	-	-	-
Chronic Health	No (Excellent)	No (Excellent)	97.5%	97.0%	-	-
Aesthetic	No (Excellent)	No (Excellent)	98.8%	100.0%	-	-
Operational Efficiency	Yes (Unacceptable)	No (Excellent)	77.5%	95.5%	Monthly	-
Grabouw						
Acute Health Microbiological	No (Excellent)	No (Excellent)	100.0%	97.6%	-	-
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Chronic Health	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Aesthetic	No (Excellent)	No (Excellent)	99.0%	99.2%	-	-
Operational Efficiency	Yes (Unacceptable)	Yes (Unacceptable)	67.5%	63.1%	Monthly	Monthly
Greyton						
Acute Health Microbiological	Yes (Unacceptable)	Yes (Unacceptable)	42.4%	41.5%	Monthly	Monthly
Acute Health Chemical	No (Excellent)	-	100.0%	-	-	-
Chronic Health	No (Excellent)	No (Excellent)	99.5%	100.0%	-	-
Aesthetic	Yes (Unacceptable))	Yes (Unacceptable)	88.3%	85.3%	Quarterly	Quarterly
Operational Efficiency	Yes (Unacceptable)	Yes (Unacceptable)	60.8%	79.1%	Monthly	Monthly
Riviersonderend						
Acute Health Microbiological	Yes (Unacceptable)	Yes (Unacceptable)	80.0%	78.8%	Monthly	Monthly
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Chronic Health	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Aesthetic	No (Excellent)	No (Excellent)	94.2%	98.8%	-	-
Operational Efficiency	Yes (Unacceptable)	Yes (Unacceptable)	78.5%	64.7%	Monthly	Monthly
Tesselaarsdal						
Acute Health Microbiological	Yes (Unacceptable)	Yes (Unacceptable)	94.4%	86.4%	Monthly	Monthly
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Chronic Health	No (Excellent)	No (Excellent)	98.3%	98.8%	-	-
Aesthetic	No (Excellent)	No (Excellent)	97.1%	96.2%	-	-
Operational Efficiency	Yes (Unacceptable)	Yes (Unacceptable)	86.3%	73.8%	Monthly	Monthly
Villiersdorp						
Acute Health Microbiological	Yes (Unacceptable)	Yes (Unacceptable)	58.3%	81.3%	Monthly	Monthly
Acute Health Chemical	No (Excellent)	-	100.0%	-	-	-
Chronic Health	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Aesthetic	Yes (Unacceptable)	Yes (Unacceptable)	81.4%	76.2%	Quarterly	Quarterly
Operational Efficiency	Yes (Unacceptable)	Yes (Unacceptable)	63.2%	70.4%	Monthly	Monthly

The water quality categories Acute Health Chemical and Chronic Health of all the water distribution systems in Theewaterskloof Municipality were categorised as "Excellent" for the 2023/2024 financial year. The Acute Health Microbiological category for Villiersdorp, Genadendal, Voorstekraal, Greyton, Riviersonderend and Tesselaarsdal and the and Aesthetic category for Villiersdorp, Genadendal and Greyton were categorised as "Unacceptable". The Operational Efficiency category for all the systems, except Voorstekraal and Bereaville, was also categorised as "Unacceptable" (According to the SANS 241:2015 classification).

The table below gives an overview of the four categories under which the risks posed by micro-organism, physical or aesthetic property or chemical substance of potable water is normally classified:

Table A.6.7: Four categories under which the risks posed by micro-organism, physical or aesthetic property or chemical substance of potable water is normally classified

Category	Risk
Acute Health	Determinand that poses an immediate unacceptable health risk if present at concentration values exceeding the numerical limits specified in this part of SANS 241.
Aesthetic	Determinand that taints water with respect to taste, odour and colour and that does not pose an unacceptable health risk if present at concentration values exceeding the numerical limits specified in SANS 241.
Chronic Health	Determinand that poses an unacceptable health risk if ingested over an extended period if present at concentration values exceeding the numerical limits specified in SANS 241.
Operational	Determinand that is essential for assessing the efficient operation of treatment systems and risks from infrastructure

The table below indicates the compliance of the E.Coli monitoring frequency in the water distribution systems of Theewaterskloof Municipality, in terms of the minimum requirements of SANS:241-2: 2015 (Table 2). The period assessed was for samples taken from July 2023 to June 2024.

Table A.6.8: Theewaterskloof Municipality's compliance of the monthly E.Coli monitoring frequency in the water distribution systems in terms of the minimum requirements of SANS 241-2:2015 (Table 2).

Schemes	Population served	Required number of monthly samples (SANS 241-2:2015: Table 2)	Number of monthly E.Coli samples taken by Municipality during 2023/2024
Bot River	8 317	2.0	2.3
Caledon	18 804	3.8	3.9
Genadendal	4 674	2.0	2.5
Bereaville	851	2.0	1.8
Voorstekraal	1 030	2.0	1.9
Grabouw	85 331	17.1	6.5
Greyton	3 871	2.0	4.4
Riviersonderend	7 054	2.0	2.4
Tesselaarsdal	1 676	2.0	3.3
Villiersdorp	16 210	3.2	4.0
Total	**188 358**	**38.1**	**33.0**

It can be noted from the above table that the number of monthly E.Coli samples taken by the Municipality during the 2023/2024 financial year was sufficient for all the water distribution systems, except for Bereaville, Voorstekraal and Grabouw where additional samples were required.

Effluent quality: The overall Microbiological, Chemical and Physical compliance percentages of the final effluent samples taken over the last two financial years for the various WWTWs are summarised in the tables below.

Table A.6.9: Percentage Microbiological compliance of the compliance samples taken at the various WWTWs for the last two financial years

WWTW	2022/2023	2023/2024
Grabouw (E.Coli)	8.33%	9.09%
Bot River (Faecal Coliforms)	63.64%	36.36%
Villiersdorp (Faecal Coliforms)	0.00%	8.33%
Genadendal (Faecal Coliforms)	8.33%	30.00%
Tesselaarsdal (E.Coli)	66.67%	60.00%
Caledon (E.Coli)	0.00%	8.33%
Greyton (Faecal Coliforms)	45.45%	44.44%
Riviersonderend (Faecal Coliforms)	100.00%	100.00%
All WWTWs	**35.96%**	**36.05%**

Table A.6.10: Percentage Chemical compliance of the compliance samples taken at the various WWTWs for the last two financial years										
WWTW	**2022/2023**					**2023/2024**				
	Ammonia	**Nitrites & Nitrates**	**COD**	**Ortho Phosphate**	**Overall**	**Ammonia**	**Nitrites & Nitrates**	**COD**	**Ortho Phosphate**	**Overall**
Grabouw	8.33%	NA	0.00%	16.67%	**8.33%**	9.09%	NA	0.00%	9.09%	**6.06%**
Bot River	90.91%	81.82%	90.91%	45.45%	**77.27%**	36.36%	87.50%	63.64%	90.91%	**68.29%**
Villiersdorp	27.27%	45.45%	0.00%	36.36%	**27.27%**	0.00%	45.45%	0.00%	0.00%	**11.36%**
Genadendal	0.00%	100.00%	0.00%	75.00%	**43.75%**	0.00%	100.00%	10.00%	60.00%	**28.13%**
Tesselaarsdal	0.00%	100.00%	16.67%	50.00%	**41.67%**	0.00%	100.00%	0.00%	60.00%	**40.00%**
Caledon	0.00%	100.00%	10.00%	20.00%	**32.50%**	83.33%	100.00%	8.33%	41.67%	**58.33%**
Greyton	18.18%	100.00%	18.18%	100.00%	**59.09%**	88.89%	100.00%	44.44%	100.00%	**78.57%**
Riviersonderend	NA	NA	100.00%	NA	**100.00%**	NA	NA	100.00%	NA	**100.00%**
All WWTWs	**20.25%**	**88.06%**	**28.09%**	**49.37%**	**44.27%**	**31.08%**	**84.09%**	**28.24%**	**50.00%**	**43.68%**

Table A.6.11: Percentage Physical compliance of the compliance samples taken at the various WWTWs for the last two financial years								
WWTW	**2022/2023**				**2023/2024**			
	pH	**Electrical Conductivity**	**Total Suspended Solids**	**Overall**	**pH**	**Electrical Conductivity**	**Total Suspended Solids**	**Overall**
Grabouw	100.00%	91.67%	0.00%	**63.89%**	100.00%	90.91%	18.18%	**69.70%**
Bot River	100.00%	100.00%	100.00%	**100.00%**	100.00%	90.91%	72.73%	**87.88%**
Villiersdorp	72.73%	90.91%	27.27%	**63.64%**	100.00%	90.91%	9.09%	**66.67%**
Genadendal	100.00%	100.00%	0.00%	**66.67%**	100.00%	100.00%	20.00%	**73.33%**
Tesselaarsdal	100.00%	25.00%	50.00%	**58.33%**	100.00%	20.00%	40.00%	**53.33%**
Caledon	50.00%	20.00%	20.00%	**30.00%**	100.00%	75.00%	50.00%	**75.00%**
Greyton	100.00%	100.00%	0.00%	**66.67%**	100.00%	88.89%	55.56%	**81.48%**
Riviersonderend	90.00%	100.00%	NA	**95.00%**	90.91%	100.00%	NA	**95.45%**
All WWTWs	**89.89%**	**78.65%**	**27.85%**	**66.93%**	**98.82%**	**82.35%**	**37.84%**	**74.59%**

Industrial Consumers: Special application must be made to discharge industrial effluent into the sewage disposal system including detailed information to ensure the composition of the effluent meets the standards and criteria of the Municipality. The Municipality's Water and Sanitation Services By-law, with regard to the discharge of industrial effluent into the sewer system, were promulgated and all industrial consumers need to formally apply for the discharge of industrial effluent into the sewer system.

Four industrial consumers are monitored on a monthly basis by Theewaterskloof Municipality with regard to the quality of industrial effluent discharged by them.

TOPIC 7: FINANCIAL

Capital Budget: The table below gives an overview of Theewaterskloof Municipality's historical water and sewerage capital expenditure over the last five financial years.

Table A.7.1: Historical Capital Expenditure of the Water and Sewerage Infrastructure Budgets

Financial Year	Water			Sewerage		
	Budget	Expenditure	% of Capital Budget	Budget	Expenditure	% of Capital Budget
2019-2020	R4 959 411	R3 541 907	71.4%	R23 223 289	R21 390 475	92.1%
2020-2021	R17 271 180	R9 114 351	52.8%	R36 235 170	R26 306 673	72.6%
2021-2022	R27 217 056	R16 433 600	60.4%	R29 106 992	R26 055 620	89.5%
2022-2023	R36 962 533	R36 270 633	98.1%	R32 899 206	R31 006 579	94.2%
2023-2024	R35 766 839	R29 023 700	81.1%	R22 749 188	R18 859 570	82.9%
Total for 5 yrs	**R122 177 019**	**R94 384 191**	**77.3%**	**R144 213 845**	**R123 618 917**	**85.7%**
Average per yr	**R24 435 404**	**R18 876 838**	**77.3%**	**R28 842 769**	**R24 723 783**	**85.7%**

Operational Budget: The table below gives a summary of the total operational expenditure and income for water and sanitation services for the last five financial years.

Table A.7.2: Summary of Operational and Maintenance expenditure and income for water and sanitation services

Description	Record Prior (R)				2023/2024
	2019/2020	2020/2021	2021/2022	2022/2023	
Water Services					
Expenditure	R60 128 083	R61 095 031	R67 710 716	R192 448 486	R130 732 301
Income	R81 683 664	R87 228 948	R91 350 176	R91 246 423	R117 232 485
Surplus / Deficit	**R21 555 581**	**R26 133 917**	**R23 639 460**	**R101 202 063**	**R13 449 816**
Sanitation Services					
Expenditure	R38 608 520	R45 928 301	R47 841 660	R50 579 934	R66 273 635
Income	R43 783 926	R47 953 602	R50 187 743	R53 964 082	R58 148 877
Surplus / Deficit	**R5 175 406**	**R2 025 301**	**R2 346 083**	**R3 384 148**	**R8 124 758**

The O&M expenditure for water and sanitation services were more than the income for these services during the 2023/2024 financial year, which is a concern and needs to be addressed by Theewaterskloof Municipality.

Tariff and Charges: The first six (6) kl of water is provided free to all indigent registered households. Theewaterskloof Municipality's tariffs support the viability and sustainability of water supply services to the poor through cross-subsidies (where feasible). Free basic water and sanitation services are linked to the Municipality's Indigent Policy and all indigent households therefore receive free basic water and sanitation services. The subsidisation mechanism used for the provision of free basic water is primarily aimed at supporting those who cannot afford to pay, in addition to the provision of subsidies to the indigent.

Theewaterskloof Municipality's current (2024/2025) water and sewer tariffs are based on the following:

- A five block step rising residential water tariff structure with the first 6 kl/month only being provided free of charge to all indigent registered households. The current residential step block tariff structure however does not adequately discourage the wasteful or inefficient use of water (Cost of higher blocks are too low, compared to other Municipalities).
- Water tariffs to other consumers / non domestic are typically based on a three-step rising block structure.
- Four phases of water restriction tariffs are in place for drought periods.
- Basic sewerage charge per residential premise, exclusively for single residential purpose, is a fixed charge irrespective of the number of toilet pans or urinals.
- The sewerage tariff for businesses and other consumers is based on the number of toilets or urinals present at the property.

The costs residential consumers had to pay for their water in Theewaterskloof Municipality's Management Area, for the various financial years, are presented on the graph below.

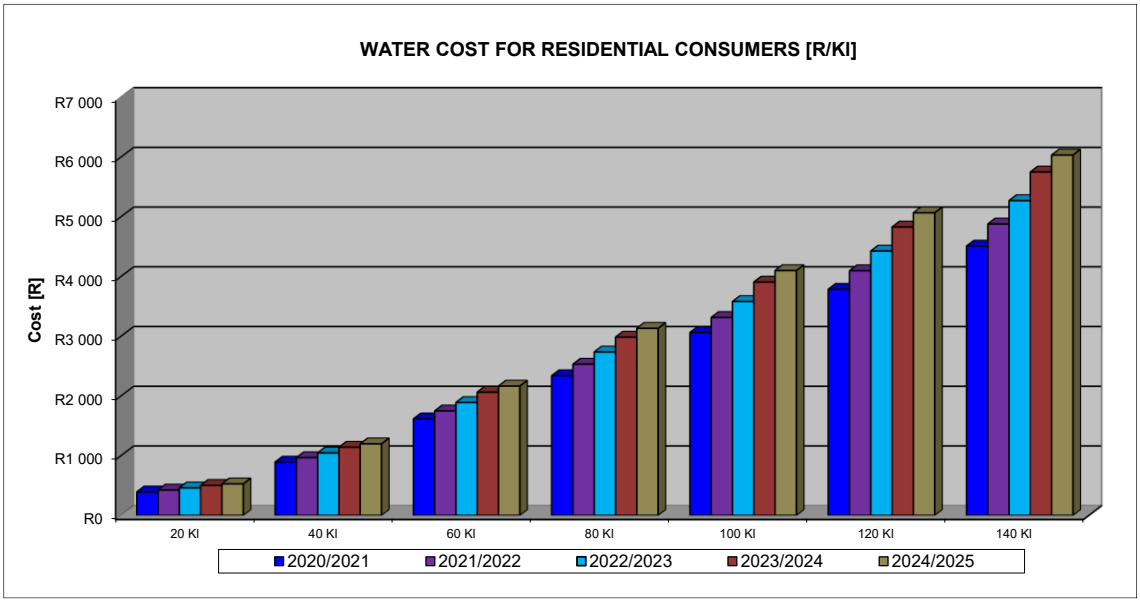


Figure A.7.1: Water Cost for Residential Consumers

TOPIC 8: WATER SERVICES INSTITUTIONAL ARRANGEMENTS AND CUSTOMER SERVICES

Theewaterskloof Municipality is the WSA for the entire Municipal Management Area. Service Level Agreements are in place with the Overberg Water Board, Groenland WUA and the Elandskloof Irrigation Board for the provision of bulk water to Caledon, Grabouw and Villiersdorp. The obligations of the Bulk Water Services Providers are to deliver the services to particular standards of supply and service and to report on the extent of its compliance with those standards. Package water treatment plants were installed for Caledon, Greyton, Bereaville and Voorstekraal and these WTWs are managed and operated by Ikusasa Water, who acts as bulk Water Services Provider to the Municipality.

The IDP is the Municipality's single most strategic document that drives and directs all implementation and related processes. The Municipality's budget is developed based on the priorities, programmes and projects of the IDP, after which a Service Delivery Budget Implementation Plan (SDBIP) is developed, to ensure that the organisation actually delivers on the IDP targets.

The SDBIP is the process plan and performance indicator / evaluation for the execution of the budget. The SDBIP is being used as a management, implementation and monitoring tool that assists and guide the Executive Mayor, Councillors, Municipal Manager, Senior Managers and the community. The plan serves as an input to the performance agreements of the Municipal Manager and Directors. It also forms the basis for the monthly, quarterly, mid-year and the annual assessment report and performance assessments of the Municipal Manager and Directors.

Finally, the Annual Report, of which the WSDP Performance- and Water Services Audit Report form a part, records the success or otherwise of the previous year's implementation.

The Municipal personnel is continuously exposed to training opportunities, skills development and capacity building at a technical, operations and management level in an effort to create a more efficient overall service to the users. A Workplace Skills Plan is compiled every year and the specific training needs of the personnel, with regard to water and wastewater management are determined annually.

Municipal Strategic Self-Assessment (MuSSA): Overseen by the DWS the MuSSA conveys the overall business health of municipal water business and serves as a key source of information around municipal performance. The MuSSA also identifies key municipal vulnerabilities that are strategically important to DWS, the Department of Cooperative Government (DCoG), National Treasury, the planning Commission/Office of the Presidency, the South African Local Government Association (SALGA) and the municipalities themselves. The MuSSA team continues to engage (1) DWS directorates and their associated programmes (e.g. Water Services Development Plan, Water Services Regulation), and (2) other sector departments and their associated programmes (e.g. LGTAS, MISA) to minimize duplication and ensure alignment. Through the tracking of current and likely future performance, the key areas of vulnerability identified, allow municipalities to effectively plan and direct appropriate resources that will also enable DWS and the sector to provide support that is more effective.

The Spider Diagram and table below effectively indicates the vulnerability levels of Theewaterskloof Municipality across the eighteen key service areas, as identified through the Municipal Strategic Self-Assessment of Water Services process.

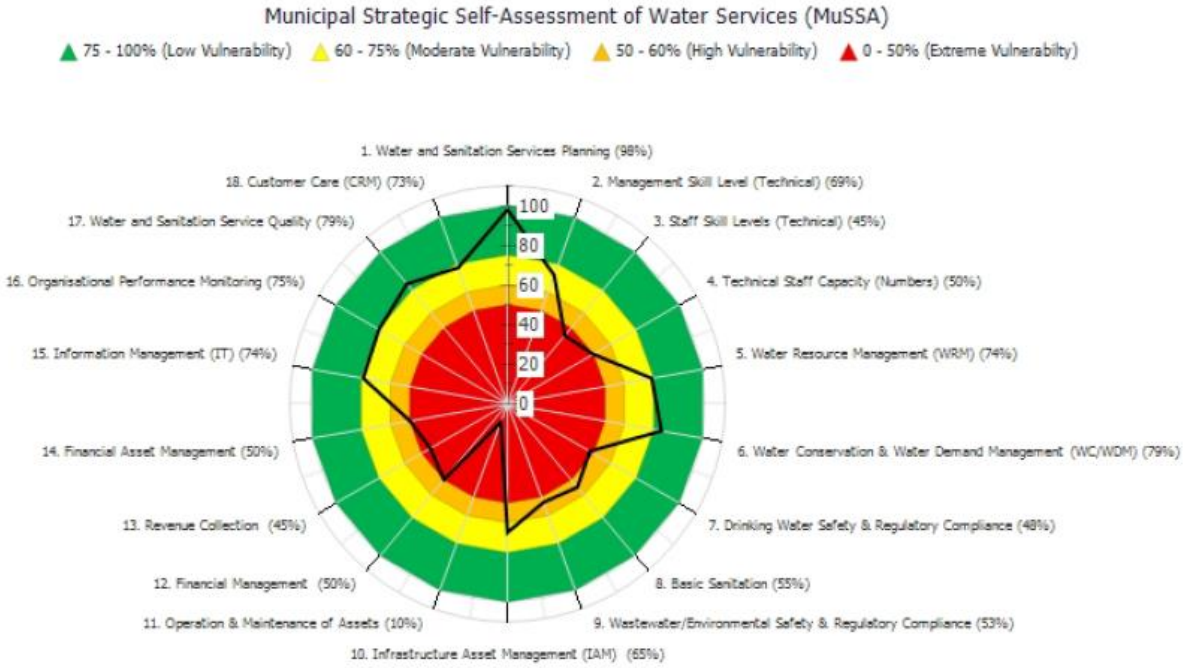


Figure A.8.1: Spider Diagram of the Vulnerability Levels of Theewaterskloof Municipality for 2024

Theewaterskloof Municipality's Vulnerability Index for 2024 was indicated as 0.72 "High Vulnerability". The areas of concern evident from the 2024 assessment are Operation & Maintenance of Assets (10.0%), Financial Management (50.0%), Revenue Collection (45.0%), Financial Asset Management (50.0%), Staff Skill Levels (Technical) (45.0%), Technical Staff Capacity (Numbers) (50.0%), Drinking Water Safety & Regulatory Compliance (48.0%), Basic Sanitation (55.0%) and Wastewater/Environmental Safety & Regulatory Compliance (53.0%).

The number of water and sanitation personnel for the last three financial years and the 2023/2024 vacancy rates are indicated in the table below.

Table A.8.1: Number of water and sanitation personnel employed and vacancy rates for the 2023/2024 financial year.

Description	2021/2022	2022/2023	2023/2024			
	Employees	Employees	Approved Posts	Employees	Vacancies	Vacancies
	No.	No.	No.	No.	No.	%
Water and Sewerage Networks	43	47	43	39	4	9%
Sanitation Services (Water and Sewerage Purification)	56	51	56	50	6	11%
Total	**99**	**98**	**99**	**89**	**10**	**10%**

Theewaterskloof Municipality is currently effectively managing their water and sanitation services. Special focus is however required to ensure adequate rehabilitation and maintenance of the existing water and sewerage infrastructure, with adequate operational personnel.

Council approved client care and customer relations and communication strategies to create functional relations between the client and the municipality. The directorate operations implemented a centralised complaints register in all the towns.

The municipality developed help desks at all the town offices in order to extend its services to clients and to become more customer friendly. In terms of communication with the public the municipality extended its social media footprint. Website, facebook and sms-communication were integrated with more traditional means of communication such as newsletters and as a result the municipality is in a better position to communicate in the language and idiom of the diverse community.

All complaints are logged in a log-book system at each of the towns. The complaints are then addressed by the technical persons at each of the towns. An electronic system (IGNITE) is also in place whereby all the complaints are logged electronically. After hour emergency requests are being dealt with by the emergency control room on a twenty four hour basis.

A **Customer Services Charter** is in place for the Water and Sanitation Department of Theewaterskloof Municipality. The Quality Policy Statement is as follows:

"As Management of Water and Sanitation Department we are committed to consistently and continually provide the highest quality water and sanitation services that meet and exceed the requirements and expectations of our consumers by ensuring the implementation of a Quality Management System that complies with ISO 9001:2008."

Theewaterskloof Municipality received their 2023 No Drop Score, as calculated through the 2023 assessment done by the DWS. The 2023 No Drop assessments were performed using a reduced set of No Drop Criteria. These criteria were selected to assess a WSA's understanding of their WC/WDM status, the plans, strategies, budgets, and implementation of remedial projects. Below is a brief description of the Criteria used for the 2023 assessment.

Table A.8.2: Description of No Drop Criteria	
Criteria 1	WC/WDM status quo, plans and strategies, budgets, and implementation of projects (Water Resource Diagram, Water Balance, Council approved WC/WDM strategies and budgets)
Criteria 2	Asset management as it relates to meter replacement. Monitoring, analysis, and action of high loss District Metered Areas (DMAs) in metropolitan municipalities
Criteria 3	Technical skills of WC/WDM team
Criteria 5	Compliance and Performance based on the water loss and efficiency Key Performance Indicators (KPI) and year on year improvement there-of

The purpose of the 2023 No Drop Assessments was twofold:

- To complete the consultative assessment of the 144 WSAs as per the No Drop Requirements based on the 2021/22 financial year.
- To update the water balance and water loss benchmarking for the 2022/23 financial year. This is reported on in the Status of Water Loss, Water Use Efficiency and Non-Revenue Water in South African Municipalities (2012/13 to 2022/23).

The No Drop results for Theewaterskloof Municipality are presented in the table below.

Table A.8.3: No Drop Performance of the Municipality (DWS's 2023 No Drop Report)		
No Drop Score (2021/2022)		**60%**
Criteria	**Weight**	**Score**
1: WC/WDM Strategy, Planning and Implementation	45%	45% (Poor)
2: Asset Management	10%	40% (Poor)
3: Technical Skills	10%	80% (Good)

Table A.8.3: No Drop Performance of the Municipality (DWS's 2023 No Drop Report)		
5: Compliance and Performance	35%	51% (Average)
Weighted Sub-Total		**50%**
Bonus		10%
Score		**60% (Average)**
Penalty 1: No evidence of approved budget		-4.7%
Penalty 2: Section 82 of the Water Servies Act		0.0%
Criteria 1 Sub-Items: WC/WDM Strategy, Planning and Implementation		
Item		**Score (Max = 1)**
1.1: Water Resources		0.3 (Poor)
1.2: Water Balance		0.6 (Average)
1.2: WC/WDM Strategy and Business Plan		0.6 (Average)
Penalty 1: No evidence of approved budget		0.0
Criteria 5 Sub-Items: Compliance and Performance		
Item		**Score (Max = 1)**
5.1: Reticulation Leak Repair		0.3 (Poor)
5.2: Physical Water Losses		0.6 (Average)
5.3: Commercial Water Losses		0.4 (Poor)
5.4: Non-Revenue Water		0.4 (Poor)
5.5: Water Use Efficiency		0.9 (Excellent)
Water Balance Integrity		**Low (Poor)**

Regulatory Impression: The score of 60% indicates average performance at Theewaterskloof LM.

- There is ample room for improvement. Theewaterskloof LM has not demonstrated a satisfactory understanding of its water use situation and WC/WDM strategy.
- The IWA water balance (Reg 509 of 2001 Clause 10 of the Water Supply Regulations) did not include all the required components and/or did not cover the entire supply area. The integrity of the water balance was low.
- Proof of some consumer meter maintenance and replacements (Reg 509 of 2001 Clause 10e) was provided, but an insufficient number of interventions were implemented during the 2021/22 audit period.
- There are staff at the WSA responsible for water loss management, but there were shortcomings in the team and/or the related documentation (Clause 66 (Staff matters) of the Municipal Systems Act).
- Leak repairs were proven (Reg 509 of 2001 Clause 12), but an insufficient number of repairs were completed in the 48-hour response time.
- The regulator calculated the key performance indicators for physical water losses (ILI), commercial water losses, non-revenue water, water use efficiencies (Sec 6. (Performance Management) of the Municipal Systems Act 32 of 2000) based on the water balance.

Blue Drop Status: The 2025 Blue Drop PAT results are not yet available. DWS's previous completed Blue Drop Assessment process for the WSAs was in 2023. Blue drop status is awarded to those towns that comply with 95% criteria on drinking water quality management. The blue drop performance of Theewaterskloof Municipality was summarised as follows in the DWS's 2023 Blue Drop Report.

Table A.8.4: Blue Drop Performance of the Municipality (DWS's 2023 Blue Drop Report)	
Municipal Blue Drop Score	**2011 – 75.41%, 2012 – 71.50%, 2014 - 64.18% and 2023 – 89.56%**

Introductions: The Theewaterskloof Local Municipality supplies approximately 110 824 people with potable water through its 10 water supply systems, with a total SIV of 13.84 Ml/day. The TWK is the Water Services Authority responsible for 66.11% of the total SIV and is supported by 2 water service providers namely Overberg Water Board (OVM) and IKUSASA responsible for 24.39% and 9.50% of the total SIV, respectively. The distribution network is solely maintained by the Theewaterskloof Local Municipality:

- The Bereaville system abstracts raw water from a Weir in the Sonderend Mountain and a borehole for treatment at the Class C Bereaville Water Treatment Works (TWK), a package plant operated by IKUSASA, which serves 1 023 people, delivered at an SIV of 172 kl/d.
- The Botrivier system abstracts raw water from six boreholes for treatment at the Class D Botrivier Water Treatment Works (TWK) which serves 4 952 people, delivered at an SIV of 1 017 kl/d.
- The Caledon System serves 18 024 people delivered at a total SIV of 4 380 kl/d. The system obtains water from the OVM's Class B Ruensveld - West Water Treatment Works at an SIV of 3 377 kl/d, and abstracts raw water from two boreholes as well as from the Bazil Newmark Dam for treatment at the Class C 4 Ml Package Plant, operated by IKUSASA, at an SIV of 1 003 kl/d.
- The Genadendal-WTW system abstracts raw water from a Weir in the Upper Baviaans River for treatment at the Class D Genadendal Water Treatment Works (TWK) which serves 8 515 people, delivered at an SIV of 259 kl/d.
- The Grabouw WTW system abstracts raw water from the Eikenhof Dam for treatment at the Class B Grabouw Water Treatment Works (TWK) which serves 56 244 people, delivered at an SIV of 4 572 kl/d.
- The Greyton system abstracts raw water from the Wolwekloof weir and Gobos weir for treatment at the Class D Greyton Water Treatment Works (TWK) which serves 3 127 people, delivered at an SIV of 629 kl/d.
- The Riviersonderend WTW system abstracts raw water from the Olifantsbos and Sonderend River for treatment at the Class C Riviersonderend Water Treatment Works (TWK) which serves 5 144 people, delivered at an SIV of 979 kl/d.
- The Tesselaarsdal WTW system abstracts raw water from a borehole for treatment at the Class D Tesselaarsdal Water Treatment Works (TWK) which serves 1 511 people, delivered at an SIV of 140 kl/d.
- The Villiersdorp WTW system abstracts raw water from the Elandskloof Dam and two boreholes for treatment at the Class D Villiersdorp Water Treatment Works (TWK) which serves 11 123 people, delivered at an SIV of 1 559 kl/d.
- The Voorstekraal system abstracts raw water from a Weir in Sonderend mountain and one borehole for treatment at the Class C Voorstekraal Water Treatment Works (TWK), a package plant operated by IKUSASA, which serves 1 161 people, delivered at an SIV of 141 kl/d.

Regulatory Impression: The Theewaterskloof Local Municipality (TWK) was represented by the Manager (Water and Sanitation Division) and accompanied by a team of two technical managers responsible for the systems. The scientist responsible for the Blue Drop system took great care in uploading relevant and concise information to the applicable key performance areas on the IRIS system. The TWK showed a decline in their Blue Drop scoring from 75% in 2011 to 64% in 2014. The advantage of having a dedicated person responsible for Blue Drop implementation is clearly seen in the increase in Blue Drop performance up to the current score of 87% and the regulator applauds this approach.

Water Safety Plans and Risk Registers are in place. Initial WaSP's were done in 2018 and updated in July 2021. The WSI's support functions on the maintenance side are in place while there is also a good complement of technical people appointed on the management side to oversee and implement operations. There is excellent Engineering Capacity within the WSI, the WSI further has a Candidate Scientist including a three-year contract for outsourcing further scientific services with professional scientific capacity. Satisfactory handling of incidents and implementation of water demand management was seen. The WSI is requested to ensure that daily flow data is logged to properly evaluate whether the treatment works are exceeding their design capacities, the WSI is also requested to provide up-to-date proof of the accuracy of its water meters. Overall water quality results were good however the compliance monitoring programs as captured in the WaSP regarding the frequency of sampling were not in line with the SANS 241 requirements. The WSI is further requested to update its risk-based monitoring program to ensure site-specific risk-based monitoring is being carried out..

The total capital budget for the municipality is R29.8 million, of which R7.1 million has been used on several major projects as set out below:

- Smart Meters replacement across the entire TLM (R10.0 mil; spent = R4.86 mil)
- Caledon Water network upgrading (budget = R1.0 mil; spent = R0.91mil)

Table A.8.4: Blue Drop Performance of the Municipality (DWS's 2023 Blue Drop Report)

- Caledon Pipe Replacement (budget = R1.10 mil; spent = R0.48 mil)
- Greyton housing bulk water (budget = R 29 754; spent = R 29 754)
- Greyton WTW Planning (budget = R0.37 mil; spent = R0.17 mil)

Blue Drop Findings:

Bereaville WSS:

- The site lacked sufficient process controller attendance, but the small system is adequately looked after on the supervision side.
- Findings from the process audit are being implemented, with reference made to a new class IV process controller appointment.
- The initial water safety plan done in December 2018 updated and signed in July 2021 has in large been implemented. The regulator takes note of the concern of vandalism in the catchment.
- The compliance monitoring captured in the WaSP states monthly sampling is to be done on 2 sampling points which is not in line with SANS 241 which requires fortnightly sampling.
- The design capacity was confirmed as 350 kl/d and operating at 49% of its capacity.
- The microbiological compliance and chemical acute compliance were excellent, resulting in a low-risk rating of 15.5% for this system.

Botrivier WSS:

- The site has sufficient process controller attendance and supervision with well-managed operational monitoring.
- Findings from the process audit are being implemented, with reference made to a new class IV process controller appointment.
- The initial water safety plan done in December 2018 updated and signed in July 2021 has in large been implemented.
- The regulator takes note of the concern of vandalism in the catchment.
- The risk-based compliance monitoring program is generic, and the frequency of microbiological samplings does not comply with the SANS 241 regulation.
- The design capacity was confirmed as 1.6 Ml/d and operating at 63.6% of its capacity. Although proof of calibration was provided for the flow meters the WSI did not provide daily flow results over the 12-month period.
- The microbiological and chemical acute compliance was excellent, resulting in a low-risk rating of 15.98% for this system.

Caledon WSS:

- The 4 Ml Package Plant, operated by IKUSASA, lacked sufficient process controller attendance, but the small system is adequately looked after on the supervision side.
- Findings from the process audit are being implemented, with reference made to a new Raw water meter that was put in place.
- No formal WaSP was provided, only a Risk register with findings from the Process Audit and proof of implementation thereof.
- No information regarding the compliance monitoring program was provided, the system requires 4 monitoring points and only has 3, and microbiological sampling is done monthly and not fortnightly as required.
- The microbiological compliance and chemical acute compliance were excellent.
- The system achieved a medium Blue Drop Risk Rating of 34.99% for this system.

Genadendal WSS:

- The site has sufficient process controller attendance and supervision with well-managed operational monitoring.
- Findings from the process audit are being implemented, with reference made to a Magflow meter installed. WSI did not provide verification of flow meter readings.
- The WaSP, updated and signed in July 2021, has in large been implemented. The regulator takes note that 3 of the seven high risks identified were mitigated.
- The design capacity was confirmed as 300 kl/d and operating at 86.3% of its capacity.
- The microbiological compliance was poor, scoring 0% with no adverse water alerts notices issued. The chemical acute compliance was excellent.
- The system achieved a medium risk rating of 28.79%.

Table A.8.4: Blue Drop Performance of the Municipality (DWS's 2023 Blue Drop Report)

Grabouw WSS:

- The site has sufficient process controller attendance and supervision with well-managed operational monitoring.
- Findings from the process audit are being implemented, with reference made to the updating of the monitoring plan to include aluminium, due to the change in the coagulant used.
- The WaSP, updated and signed in July 2021, has in large been implemented. WSI noted watercolour as a major risk in the catchment, the regulator notes that WSI move from ultra floc to Alum and provided training in the use of Alum as mitigation measures. The design capacity was confirmed as 350 kl/d and operating at 49% of its capacity.
- The design capacity was confirmed as 15 Ml/d and operating at 30.5% of its capacity.
- The microbiological compliance was poor, scoring 0% with no adverse water alerts notices issued. The chemical acute compliance was excellent.
- The system achieved a low-risk rating of 21.79%.

Greyton WSS:

- The site has sufficient process controller attendance and supervision with well-managed operational monitoring.
- Findings from the process audit are being implemented, with reference made to the updating of the monitoring plan to include aluminium, due to the change in the coagulant used.
- The WaSP, updated and signed in July 2021, has in large been implemented. There were 3 High risks identified and all three were proven to be mitigated. The regulator notes that financial support was given to appoint an outside Engineering consultant.
- The design capacity was confirmed as 1.8 Ml/d and operating at 34.9% of its capacity.
- The microbiological compliance and chemical acute compliance were excellent, resulting in a low-risk rating of 16.79% for this system.

Riviersonderend WSS:

- The site lacked sufficient process controller attendance, but is adequately looked after on the supervision side.
- Findings from the process audit are being implemented, the regulator notes that calibration of the flow meters was done.
- The WaSP, updated and signed in July 2021, has in large been implemented. There were 3 High risks identified and all three were proven to be mitigated. The regulator notes that colour and NTU values were identified as a catchment risk, and that the settlement tank is not operating optimally at the plant and should be covered.
- The design capacity was confirmed as 2.4 Ml/d and operating at 40.8% of its capacity.
- The microbiological compliance and chemical acute compliance were excellent, resulting in a low-risk rating of 17.84% for this system.

Tesselaarsdal WSS:

- The site lacked sufficient process controller attendance; the supervision does comply but there is no proof of any operational monitoring being done.
- Findings from the process audit are being implemented, the regulator notes that a new flowmeter was installed and that a logbook was provided for plant entries as per PA.
- The WaSP was updated and signed in July 2021. The WSI was questioned on their knowledge of the report and the regulator notes that groundwater yield was identified as a high risk to be addressed through a geohydrological study. No proof of any implementation was provided.
- The design capacity was confirmed as 500 kl/d and operating at 28% of its capacity.
- The microbiological compliance was poor, scoring 50% with no adverse water alerts notices issued. The chemical acute compliance was excellent.
- The system achieved a low-risk rating of 22.0%.

Villiersdorp WSS:

- The site has sufficient process controller attendance and supervision with well-managed operational monitoring.
- Findings from the process audit are being implemented, the regulator notes that a consultant was appointed to assist with sand replacement and nozzle issues at filters.
- The WaSP was updated and signed in July 2021. The regulator notes that 7 high risks were identified of which 6 were mitigated.
- The design capacity was confirmed as 2.9 Ml/d and operating at 53.8% of its capacity.
- The microbiological compliance and chemical acute compliance were excellent.

Table A.8.4: Blue Drop Performance of the Municipality (DWS's 2023 Blue Drop Report)

- The system achieved a medium rating of 25.57%.

Voorstekraal WSS:

- The site lacked sufficient process controller attendance but is adequately looked after on the supervision side.
- Findings from the process audit are being implemented, proof was provided of the servicing of the fire extinguishers as per PA recommendations.
- The WaSP was updated and signed in July 2021. The regulator notes that all high risks were mitigated as per the WaSP recommendations.
- The design capacity was confirmed as 350 kl/d and operating at 40.3% of its capacity.
- The microbiological compliance and chemical acute compliance were excellent, resulting in a very low-risk rating of 12.52% for this system.

Technical Site Assessment:

The **Grabouw WTP** was inspected to verify the Blue Drop audit findings and received a technical site score assessment of 82.0%. The plant, with an available treatment capacity of 15 ML/day, was found to be in a good condition (operational), well managed and generally well-maintained. The Civil and Mechanical condition of the sand filtration is poor, and provision should be made to urgently replace selective underfloor nozzles and filter media, the plant also requires some minor general repairs to be done to the paving and general upkeeping of the buildings all amounting to a VROOM amount of R 518 320/Ml. Upgrading the chlorine gas storage facility and installation of screens at the raw water extraction point should be considered. The final water quality produced by the treatment plant is excellent with a Microbiological (Acute Health) compliance of >99.90% and a Chemical compliance (Acute and Chronic Health) of >99.90% and 99.73% respectively. The non- Health Aesthetic compliance is excellent at 98.18%, the Operational Monitoring and Risk Def compliance is poor at 55.79% and 82.85% respectively. It was noted that due to budget constraints samples are taken every 30 days on average and not fortnightly as per SANS 241 minimum requirement, this needs to be addressed urgently. Workplace satisfaction is high, however on-site security should be upgraded to ensure the safety of the staff.

Performance Area		Bereaville	Botrivier	Caledon	Genadendal	Grabouw	Greyton	Riviersonder-end	Tesselaars-dal	Villiersdorp	Voorste-kraal
Bulk/WSP		-	-	Overberg Water	-	-	-	-	-	-	-
Capacity Management	15%	90.00%	100.0%	97.71%	100.00%	100.00%	100.00%	90.00%	90.0%	100.00%	85.00%
DWQ Risk Management	20%	87.00%	88.00%	80.63%	87.00%	88.00%	85.00%	80.00%	77.00%	88.00%	91.00%
Financial Management	10%	100.00%	100.00%	93.25%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Technical Management	20%	86.00%	91.00%	91.00%	88.00%	91.00%	91.00%	91.00%	88.00%	100.00%	86.00%
DWQ Compliance	35%	75.00%	95.00%	57.46%	45.00%	75.00%	80.00%	75.00%	64.00%	75.00%	90.00%
Bonus	10%	75.00%	100.00%	76.93%	100.00%	100.00%	100.00%	100.00%	75.00%	100.00%	100.00%
Penalties	10%	0.00%	0.00%	0.00%	50.00%	0.00%	0.00%	0.00%	15.00%	0.00%	0.00%
Disqualifiers		None	None	None	None	None	None	None	None	None	None
Blue Drop Score (2023)	**%**	**88.10%**	**96.55%**	**84.19%**	**78.25%**	**92.05%**	**93.20%**	**88.95%**	**83.03%**	**93.85%**	**94.65%**
Blue Drop Score (2014)	%	0.00%	70.90%	90.60%	50.80%	57.90%	50.70%	61.70%	49.10%	53.30%	NA
Blue Drop Score (2012)	%	0.00%	61.70%	84.30%	68.70%	65.30%	54.50%	58.10%	60.70%	68.90%	NA
Blue Drop Score (2011)	%	0.00%	76.40%	8.60%	75.30%	64.10%	79.60%	67.50%	76.40%	58.90%	NA
System Design Capacity	kl/d	350	1 600	11 900	300	15 000	1 800	2 400	200	2 900	350
System Available Capacity	kl/d	350	1 600	11 900	300	15 000	1 800	2 400	500	2 900	350
System Input Value	kl/d	172	1 017	4 380	259	4 572	629	979	140	1 559	141
Capacity Utilization	%	49.14%	63.56%	56.46%	86.33%	30.48%	34.94%	40.79%	28.00%	53.76%	40.29%
Average Daily Consumption	l/p/d	168	205	243	30	81	201	190	93	140	121
Resource Abstracted From		Weir in the Sonderend Mountain and a borehole	Six boreholes	Sonderend River (OVM), Two boreholes and	Weir in the Upper Baviaans River	Eikenhof Dam	Wolwekloofweir and Gobos Weir	Olifantsbos and Sonderend River	Borehole	Elandskloof dam and two boreholes	Weir in Sonderend mountain

Table A.8.4: Blue Drop Performance of the Municipality (DWS's 2023 Blue Drop Report)											
				Bazil Newmark Dam (WSI)							and one borehole
Microbiological Compliance	%	99.99%	99.99%	94.87%	92.31%	99.99%	99.99%	99.99%	95.83%	99.99%	99.99%
Chemical Health Compliance	%	99.25%	99.35%	99.63%	99.35%	99.78%	99.54%	98.70%	99.99%	99.34%	99.25%
Risk Defined Compliance	%	90.91%	95.52%	88.99%	84.09%	82.85%	79.69%	90.15%	93.33%	75.19%	97.52%
VROOM	Rand	-	-	R4 560 000	-	R7 800 000	-	-	-	-	-
BDRR 2023	**%**	**15.47%**	**15.98%**	**41.90%**	**28.79%**	**21.79%**	**16.78%**	**17.84%**	**22.00%**	**25.57%**	**12.52%**
BDRR 2022	**%**	**25.70%**	**16.10%**	**44.10%**	**44.00%**	**42.70%**	**29.20%**	**21.10%**	**21.70%**	**29.30%**	**38.50%**

The average daily consumption (l/p/d) for the last four financial years are summarised in the table below.

Table A.8.5: Average daily consumption (l/p/d) for the last four financial years												
Distribution System	**2020/2021**			**2021/2022**			**2022/2023**			**2023/2024**		
	Estimated Permanent Population	**Aver. Daily Billed Metered Res. Consump-tion (kl)**	**Aver. Daily consump-tion (l/p/d)**	**Estimated Permanent Population**	**Aver. Daily Billed Metered Res. Consump-tion (kl)**	**Aver. Daily consump-tion (l/p/d)**	**Estimated Permanent Population**	**Aver. Daily Billed Metered Res. Consump-tion (kl)**	**Aver. Daily consump-tion (l/p/d)**	**Estimated Permanent Population**	**Aver. Daily Billed Metered Res. Consump-tion (kl)**	**Aver. Daily consump-tion (l/p/d)**
Bot River	7 501	348.707	**46**	7 764	380.378	**49**	8 036	377.723	**47**	8 317	369.345	**44**
Caledon	17 462	926.203	**53**	17 898	998.562	**56**	18 346	1 036.041	**56**	18 804	1 055.808	**56**
Greater Genadendal	6 318	316.762	**50**	6 396	365.704	**57**	6 475	361.208	**56**	6 554	424.940	**65**
Grabouw	65 891	1 313.781	**20**	71 821	1 415.225	**20**	78 285	1 547.534	**20**	85 331	1 778.367	**21**
Greyton	3 563	272.208	**76**	3 663	281.551	**77**	3 765	286.258	**76**	3 871	299.370	**77**
Riviersonderend	6 550	436.288	**67**	6 714	481.671	**72**	6 882	535.597	**78**	7 054	552.732	**78**
Tesselaarsdal	1 556	79.066	**51**	1 595	85.162	**53**	1 635	89.353	**55**	1 676	86.792	**52**
Villiersdorp	14 411	556.811	**39**	14 987	581.762	**39**	15 587	578.022	**37**	16 210	613.584	**38**
All Systems	**118 923**	**4 249.825**	**36**	**125 614**	**4 590.014**	**37**	**132 771**	**4 811.737**	**36**	**140 424**	**5 180.937**	**37**

Green Drop Status: The 2025 Green Drop Assessment results are not yet available. DWS's previous complete Green Drop assessment for the WSAs was in 2021 and the results were received early in 2022. Green drop status is awarded to those WSAs that comply with 90% criteria on key selected indicators on wastewater quality management. The green drop performance of Theewaterskloof Municipality is summarised as follows in the DWS's 2022 Green Drop Report.

Table A.8.6: Green Drop Performance of the Municipality (DWS's 2022 Green Drop Report)	
Average Green Drop Score	**2009 – 30.0%, 2011 – 66.0%, 2013 – 56.0%, 2021 – 87.0%**

Regulatory Impression: The Green Drop audit team enjoyed a stimulating and positive interaction with the Theewaterskloof municipal officials. The team came well prepared and able to provide most information. Theewaterskloof is a good example of an institution who uses Green Drop standards to steer and support a deeper mission for excellent wastewater services delivery which is at the core of their function. Despite COVID challenges, the municipality continued to impress the Regulator by responding excellently to the Green Drop requirements, one example being that sampling and monitoring was conducted throughout the year as part of essential services.

One of the main crucial elements that stands between the WSA and Green Drop Certification would be final effluent compliance that were meeting the authorisation standards. Typical shortcomings of effluent non-compliance were noted at Grabouw treatment works during the site visit assessment. Most systems also receive very low flows, and this impact need to be investigated in terms of optimising C:N:P loads to the plants. The Green Drop score of 87% is well deserved and the Regulator have no doubt that this exemplary team will attain GD certification in 2023. This is a vast improvement from 57% obtained in 2013. The municipality obtained scores of more than 80% for 6 of the systems. Well done.

Green Drop Findings:

1. An up to standard O&M manual is in place with very useful information (even includes a copy of the bylaws).
2. Operational monitoring for some of the systems require improvements or to be structured more clearly.
3. Municipality is commended for linking the Process audit and risks identified in risk abatement plan with proper implementation.
4. The WSA provided sound financial management reports for all the systems.
5. Theewaterskloof LM performed well in Capacity Management, environmental management, and financial management, this is a commendable effort
6. No plants situated in the high or critical risk positions
7. Budget had been secured for capital projects for replacement, upgrades, and addition of new unit process at some of the WWTWs and associated infrastructure:
   - R25,528,000: Caledon WWTWs upgrade through MIG funding, this is still a business plan and is not yet approved.
   - R1,900,000: Botriver WWTW feasibility and business plan for upgrades of the WWTWs.
   - R28,000,000: Villiersdorp WWTW feasibility and business plan for upgrades of the WWTWs, business plan and is not yet approved.

Site Inspection report: Grabouw WWTW 61%. The Grabouw WWTW was inspected to verify the Green Drop audit findings:

- The Grabouw WWTW is an 8.5 Ml/d works, the works is relatively old with some additions to increase its capacity.
- Screens and grit chambers were observed to be generally old and could be optimised via selective upgrade/refurbishment.
- Scum baffles, blockages and centre stilling well at the clarifiers urgently needs to be addressed to avoid carry-over of sludge that is causing problems downstream in the treatment process.
- The wastewater treatment works is situated adjacent to municipal solid waste plant, which makes site tidiness problematic.
- The reactors are run as an 'extended aeration' plant and sludge wasting / management is problematic.
- Belt press has been out of commission for a long time (few years), and it was never replaced - this was due to theft and vandalism.
- The final clarifiers (on the old plant) did not have scum baffles and the newer additions scum management was not well controlled - this is likely to contribute to final effluent compliance.
- During the time of site visits assessment, the final discharge had a significant number of solids and sludge carry-over in the final effluent due to the maturation dams being full of sludge and one dam-wall broken.
- All structures were operational, but some infrastructure (walls) could be improved upon to increase security.
- General housekeeping and terrain maintenance need attention to match the good Green Drop scores attained.

Table A.8.6: Green Drop Performance of the Municipality (DWS's 2022 Green Drop Report)									
Key Performance Area	**Weight**	**Caledon**	**Botriver**	**Grabouw**	**Riviersonder-end**	**Genadendal**	**Villiersdorp**	**Greyton**	**Tesselaarsdal**
A: Capacity Management	15%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	87.5%	87.5%
B: Environmental Management	15%	100.0%	100.0%	100.0%	92.5%	96.0%	100.0%	87.5%	92.5%
C: Financial Management	20%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
D: Technical Management	20%	92.5%	92.5%	94.5%	88.8%	92.5%	92.5%	67.1%	75.9%
E: Effluent & Sludge Management	30%	50.0%	50.0%	46.0%	62.5%	41.0%	50.0%	51.3%	43.8%
F: Bonus		61.0%	60.0%	52.5%	52.5%	40.0%	68.5%	47.5%	27.5%
G: Penalties		0.0%	-25.0%	0.0%	-50.0%	0.0%	-25.0%	0.0%	0.0%
H: Disqualifiers		None	None	None	None	None	None	None	None
2021 Green Drop Score		**88%**	**87%**	**87%**	**84%**	**83%**	**87%**	**80%**	**78%**
2013 Green Drop Score		**65%**	**70%**	**43%**	**64%**	**65%**	**60%**	**25%**	**NA**
2011 Green Drop Score		**68%**	**58%**	**68%**	**52%**	**59%**	**61%**	**58%**	**NA**
2009 Green Drop Score		**30%**	**30%**	**30%**	**30%**	**0%**	**30%**	**0%**	**NA**
System Design Capacity (Ml/d)		3.500	1.050	8.500	0.700	0.721	3.500	0.300	0.040
Design Capacity Utilisation (%)		78%	24%	51%	119%	56%	33%	33%	53%
Resource Discharged into		Bas River	Botriver	Kogel Dam via Palmiet River	Irrigation only	Botriver	Elandskloof river to Theewaterskloof dam	Irrigation	Kleinrivier
Microbiological Compliance (%)		33%	31%	75%	67%	17%	33%	42%	20%
Chemical Compliance (%)		28%	57%	62%	64%	33%	87%	14%	0%
Physical Compliance (%)		46%	67%	69%	96%	80%	75%	80%	60%
Wastewater Risk Rating (CRR % of CRRmax)									
2011 CRR (%)		**76.5%**	**64.7%**	**64.7%**	**58.8%**	**41.2%**	**41.2%**	**47.1%**	**NA**
2013 CRR (%)		**58.8%**	**35.3%**	**52.9%**	**35.3%**	**23.5%**	**52.9%**	**88.2%**	**NA**
2021 CRR (%)		**58.8%**	**58.8%**	**54.5%**	**64.7%**	**58.8%**	**35.3%**	**58.8%**	**41.2%**

Theewaterskloof Municipality also received their 2023 Green Drop Risk Ratings, as calculated from the 2023 assessment done by the DWS.

Table A.8.7: Green Drop Risk Rating of the Theewaterskloof Municipality (DWS's 2023 Green Drop Progress Report)

Municipal CRR 2023 (%CRR/CRRmax)	64.7%

Introduction: Theewaterskloof Local Municipality (TLM) owns and operates six (6) activated sludge works and 2 oxidation pond systems.

Regulator's Comments: All the WWTWs are registered and classified on the IRIS system (Criteria A). The operational capacities of the WWTWs were verified by the flow data provided by TLM and all WWTWs are operating well within the design capacities (Criteria B).

With regards to technical skills, most systems received high score for criteria D (Technical skills) as supervisory and technical skills are available at all sites. The WSA should ensure that all gaps in terms of process control staff are filled with technically competent staff as only Botrivier is fully compliant in terms of process control staff. Effluent quality data is available on IRIS and based on this data Caledon and Grabouw have 6 non-compliant parameters for the year while Villiersdorp has 5. These systems with higher non-compliance will have higher CRR scores and TLM is encouraged to ensure that sufficient process control staff is available on site to ensure effective wastewater management.

The improvement in scores obtained for these systems since 2013 to date is indicative of improved wastewater management. The TLM has provided a CAP and GDIP and W_2RAP's for each of the WWTWs. The W_2RAPs have been reviewed in 2022 and signed by the Municipal Manager. Each W_2RAP has clear risks identified with the capital budget providing improvement where most needed. Ongoing capital projects include upgrades for sewer networks and bulk outfall upgrades at Botrivier, Caledon and Genadendal as well as refurbishment of the Greyton and Villiersdorp WWTWs. The TLM is commended for this improvement and for the ongoing capital projects and is encouraged to continue on this path towards Green Drop Certification.

Risk Assessment Areas	Weight	Bot River	Caledon	Genadendal	Grabouw	Greyton	Riviersonderend	Tesselaarsdal	Villiersdorp
Class of Works		D : Approved	C : Approved	D : Approved	B : Approved	E : Approved	E : Approved	D : Approved	C : Approved
Treatment Technology		Activated Sludge	Activated Sludge	Activated Sludge	Activated Sludge	Oxidation ponds	Oxidation ponds	Activated Sludge	Activated Sludge
A: Total Design Capacity	Kl/d	1 050	4 800	721	8 500	300	700	43	2 500
B: Operational Capacity (% inflow / design)	%	30.8%	58.1%	40.2%	53.3%	36.0%	0.0%	39.5%	60.2%
C: Effluent Quality Non-compliance	#	3	6	4	6	4	4	3	5
% Microbiological Compliance	%	58.3%	33.3%	75.0%	50.0%	41.7%	100.0%	84.6%	91.7%
% Physical Compliance	%	97.2%	33.3%	77.8%	63.8%	83.0%	82.4%	57.7%	86.1%
% Chemical Compliance	%	72.9%	25.4%	13.9%	29.2%	5.6%	55.6%	NMR	72.9%
D: Technical Skills Compliance	%	100.0%	83.3%	83.3%	66.7%	83.3%	66.7%	66.7%	66.7%
Process Controller Compliance	%	100.0%	50.0%	50.0%	0.0%	50.0%	0.0%	0.0%	0.0%
Supervisor Compliance	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Maintenance Team Compliance	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
CRR (2023)	%	**35.3%**	**70.6%**	**60.0%**	**66.7%**	**60.0%**	**73.3%**	**58.3%**	**58.8%**
CRR (2022)	%	**58.8%**	**58.8%**	**58.8%**	**54.5%**	**58.8%**	**64.7%**	**41.2%**	**35.3%**
CRR (2013)	%	**35.3%**	**58.8%**	**23.5%**	**52.9%**	**88.2%**	**35.3%**	-	**52.9%**
CRR (2011)	%	**64.7%**	**76.5%**	**41.2%**	**64.7%**	**47.1%**	**58.8%**	-	**41.2%**

Table A.8.7: Green Drop Risk Rating of the Theewaterskloof Municipality (DWS's 2023 Green Drop Progress Report)									
W_2RAP Status: 2022 Green Drop Report		Final document plus implementation	Final document plus implementation	Final document plus implementation	Final document plus implementation	Final document plus implementation	Final document plus implementation	Final document plus implementation	Final document plus implementation
W_2RAP Status: 2023 Green Drop PAT		Final document plus implementation	Final document plus implementation	Final document plus implementation	Final document plus implementation	Final document plus implementation	Final document plus implementation	Final document plus implementation	Final document plus implementation
Capital and Refurbishment Projects (Rand)		2 100	3 010 914	400 000	250 000	21 149 061	326 087	N/A	40 000
Description of Capital and Refurbishment Projects		Sewer network upgrading septic tank.	Bulk outfall sewer upgrade.	Housing bulk sewer.	7000 housing bulk sewer investigation planning.	Upgrade and refurbishment of the plant to increase plant capacity (1000 Houses) and compliance of effluent.	Upgrading of the water network.	Planning to relocate existing treatment works and extension of treatment process.	Upgrade of WWTW.
2022 GD Score	%	87.0%	88.0%	83.0%	87.0%	80.0%	84.0%	78.0%	87.0%
GD Improvement Plan (GDIP)	Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Corrective Action Plan (CAP)	Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

SECTION B: STATE OF WATER SERVICES PLANNING

This updated WSDP is for the 2022-2027 five year cycle. The Municipality also annually compile the WSDP Performance- and Water Services Audit Report, as required by the Water Services Act and the DWS. The WSDP Performance- and Water Services Audit Report gives an overview of the implementation of the Municipality's previous year's WSDP and can be seen as an annexure to Theewaterskloof Municipality's Annual Report. The Municipality is currently busy compiling the 2024/2025 WSDP Performance- and Water Services Audit Report, which will be approved by Council with the Municipality's Annual Report.

Theewaterskloof Municipality's Water and Sewer Master Plan process entails the establishment of computer models for the water systems and the sewer systems in Theewaterskloof Municipality, the linking of these models to the stand and water meter databases of the treasury financial system, evaluation and master planning of the networks and the posting of all the information to IMQS. The Water and Sewer Master Plans lists the analyses and findings of the study on Theewaterskloof Municipality's water distribution and sewer drainage systems. All forward planning for water and sanitation services and water and sewerage infrastructure is guided by the Water and Sewer Master Plans.

Water Safety Plans for the water resources and the water distribution systems and W_2RAPs for the WWTWs and the sewer drainage areas are in place. Detail WTW and WWTW Process Audits were also compiled during 2023/2024 for all the treatment plants.

Water Safety Plans are a form of water quality assurance through a comprehensive risk assessment and risk management approach that encompasses all steps in water supply from catchment to consumer. The multiple barrier principle implies that actions are required at all stages in the process of producing and distributing water in order to protect water quality. This includes source protection, treatment through several different stages and prevention of contamination during distribution to each individual household.

The W_2RAP is an all-inclusive risk analysis tool by which risks associated with the management of collection, treatment and disposal of wastewater are identified and rated (quantified). The W_2RAPs need to be used by Theewaterskloof Municipality to manage the identified risks according to its potential impacts on the receiving environment / community / resources.

The last Water and Sewer Master Plans, which were available for inclusion in Theewaterskloof Municipality's WSDP, were as follows:

- Water Master Plan, Theewaterskloof Municipality, September 2019, GLS Consulting
- Sewer Master Plan, Theewaterskloof Municipality, September 2019, GLS Consulting

The Water and Sewer Master Plans need to be updated at least once every three to five years.

SECTION C: WATER SERVICES EXISTING NEEDS PERSPECTIVE

The existing needs perspective as presented below was developed through a systematic and comprehensive review of the water services function in terms of the WSDP Guide Framework. The output from this process is presented below and includes compliance assessment in terms of:

- The intervention required to address the gap;
- The proposed solution to address the gap; and the
- The Future plan / identified project that would meet the requirement.

The water services situation analysis prompted the development of problem statements which formed the input for the development of the water services objectives and strategies which follows in Section D.

The Vision and Mission statements of Theewaterskloof Municipality are as follows:

Vision: "Creating a safe and secure environment and enabling economic growth through innovative service delivery".

Mission: To create and sustain an environment which shall enhance the socio-economic development capacity and impact of the Theewaterskloof Municipality in accordance with the Vision.

Theewaterskloof Municipality's Strategic Objectives are as follows:

- Basic services for all;
- Community safety;
- Improve the social environmental fabric of Theewaterskloof community;
- Healthy and productive workforce;
- Maintenance, replacements and upgrades of municipal infrastructure;
- Integrated Human Settlements;
- Make Theewaterskloof the investment destination of choice and promote second and township economy;
- Upgrading of Informal Settlements and prioritising the most needy housing allocation;
- Democratic, responsive and accountable government; and
- Sound financial management and continuous revenue growth.

The Strategic Risks of Theewaterskloof Municipality are indicated in the table below (2023/2024 Annual Report).

Table C.1: Strategic Risks of Theewaterskloof Municipality

Risk Description	Current Controls	Risk Actions	Residual Risk
Lack of funding to manage the increase in demand for Basic Services within the existing Informal Settlements	Municipal Capital and Operational Budget. Public Participation Operations Department's maintenance teams	Draft an Informal Settlements Operational Plan and Submit to Council.	High
Ageing and deterioration of fleet and small plant.	Vehicle monitoring system in place to prevent abuse / misuse of vehicles. Repairs and maintenance budget. Annual limited Capital Acquisitions. Appoint Service Provider on a three-month contract for maintenance of fleet.	Upgrade of fleet. Report on Procurement Plan Appoint Service Providers for maintenance and repairs of fleet. Implement a Feasibility Study Plan on fleet replacement, upgrade and management.	High
Limited Economic Growth	Outdated LED Strategy. Limited LED initiatives within budget constraints.	Updated LED Strategy, motivate for additional funding at the adjustment budget to cover the possible shortfall based on testing the market.	High
Mass Land Invasion	Squatter control policy. Containment Plan. Contractor appointed to demolish illegal structures. An Informal Management Department has been established to address and manage the Informal Settlements. Utilization of an eviction contractor.	Implementation of SOP for land invasions and illegal structures and report on prevention and correction measures taken.	High
SCM is under resource and under capacitated.	Interim / student assisting in the office.	Filling of vacant positions and acquiring budget for positions not budgeted for.	Medium
Inadequate Capital Funding to eradicate Infrastructure backlog timeously.	Maintaining status quo (Make do with available resources)	Construct a new Waste Transfer Station in Caledon (Phase 3). Construct Riviersonderend Waste Transfer Station and Material Recovery Facility Off Station (Phase 2). Replace and upgrade MV and LV Networks and miniature substation – Villiersdorp.	High

Table C.1: Strategic Risks of Theewaterskloof Municipality			
Risk Description	**Current Controls**	**Risk Actions**	**Residual Risk**
		Replace and upgrade MV and LV Networks – RSE.	
Bulk water provision / Water Sustainability	Technical Drought Plan. General communication – Printed media and radio. Notifications (Possible water restrictions). Alternative provision through boreholes. Explore Water Source Alternatives on continuous basis.	Install new infrastructure to service Destiny Farm low-cost housing development Villiersdorp. Upgrade WWTW at Caledon. Implement Bulk Contribution Policy.	High
Protest action / Civil unrest	LED and Social Development Departments in place to implement programmes to improve the socio-economic conditions in Theewaterskloof. Law Enforcement Units to respond to protest actions and civil unrest in order to support SAPS. Collaboration with the POPs through SAPS to plan and deal with protests and riots. Collaboration between councillors and municipal officials to engage with communities to find solutions to problems giving rise to protest actions.	Report on co-ordination and facilitation of the activities of law enforcement agencies and disaster management and other relevant role-players with the objective to include information, communication, early warning, rapid reaction in case of unrest (Civil intolerance) and other policing incidents, threats and challenges and the facilitation of a district wide Joint Operation Centre as required over multiple municipal areas.	High
Slow recovery of potential revenue.	Data cleansing project. Credit control and debt collection unit.	Implementation of Revenue Enhancement Framework. Report on Debt Collection Ratio and Credit Control Initiatives.	High
Non-compliance with Permit Conditions	Existing infrastructure. Limited Supervision.	Manage the SLA's pertaining to Waste, Water and Sewerage. Report on Operations as so far as budgeting & supervision and maintenance / replacements / upgrades. Explore better allocation of budget and resources to meet compliance requirements (Staff capacity and OPEX).	High
Unlawful Land Invasion	Squatter control policy. Land Invasion Unit.	Implementation of SOP for Land Invasions and Illegal Structures.	High

Theewaterskloof Municipality's Management Area falls within the Breede-Olifants Catchment Management Area. The Breede-Olifants Catchment Management Agency was established by extending the boundary and area of operation of the Breede-Gouritz CMA Water Management Area (Government Gazette No.47559, 25 November 2022).

The area of operation of the Breede-Olifants Catchment Management Agency includes the previous Breede-Gouritz and Berg-Olifants water management areas as pronounced in the National Water Resource Strategy second edition, 2013.

A Catchment Management Strategy is not yet available for the Breede-Olifants Water Management Area (BOWMA), but the Catchment Management Strategy of the former Breede-Gouritz Water Management Area (BGWMA), July 2017, included the following Vision and three Strategic Focus Areas.

"Healthy water resources, for all, forever,"

- **Strategic Area 1: Protecting for People and Nature:** Focusing primarily on management of streamflow, water quality, habitat and riparian zones related to riverine, wetland, estuarine and groundwater resources, to maintain important ecosystem goods and services and biodiversity.

- **Strategic Area 2: Sharing for Equity and Development:** Focusing primarily on management of water use from surface and groundwater resources through the operation of infrastructure, in order to provide water for productive and social purposes within and outside of the WMA.

- **Strategic Area 3: Co-operating for Compliance and Resilience:** Focusing primarily on co-operation and management of institutional aspects to enable and facilitate the protection and sharing of water, including the more co-operative stakeholders, partnerships, information sharing, disaster risk and adaptation elements of the strategy.

TOPIC 1: SETTLEMENTS AND DEMOGRAPHICS

Topic C.1.1: Settlement Demographics and Public Amenities						
Section	**Intervention Required**	**% (1)**	**Solution description as identified by Master Plan**	**% (2)**	**Is there an Existing project/activity addressing this problem?**	**Current Demand Overall Scoring % (3)**
Settlements Summary	Yes	100.0	Continue with the implementation of the recommended development strategies as included in the SDF and the development proposals for each of the towns and ensure that new developments are in line with the Strategic Objectives and Strategies.	100.0	Yes	92.9
	Yes	100.0	All resources, especially surface water resources, need to be re-evaluated, especially where demand is close to the safe one in twenty year yields. Establish assurance of supply levels of all water sources. Ensure that the provision of bulk water and sewerage infrastructure are aligned with the SDF and Housing Delivery Plan and that housing projects only continue once the required bulk water and sewerage infrastructure are in place, as indicated in the Water and Sewer Master Plans and this WSDP.	100.0	Yes	92.9
Summary by Settlement Group	No	100.0				100.0
Assessment Score by Settlement Type	No	100.0				100.0
Amenities Summary	No	100.0				100.0

Notes: (1) Is this section addressed in the WSDP?
(2) Were solutions identified for the possible gaps?
(3) Percentage calculated based on the above two percentages and whether there is an existing project/activity addressing this problem? Does this current listed project/activity address the problem totally? Project/Activity approved by Council as part of WSDP database? Approved by Council in project activity database and part of 5yr IDP cycle projects? Project/Activity listed in 3yr MTEF Cycle?

Theewaterskloof Municipality reviewed and updated its SDF during June 2023, which include recommendations for the biophysical environment and agriculture, socio-economic (Industrial development, tourism, economic development and mixed use development) and built environment (Population growth and land use requirements, residential, cemeteries, social facilities and densification and development of vacant land).

The Housing Department is responsible for developing Sustainable Integrated Human Settlements in the Theewaterskloof Municipal Area. Due to limited funding sources and the growing demand for housing opportunities the department is focusing on the incremental upgrading of informal settlement through the provision of basic services. In order to address the huge backlog council has started shifting its focus from providing housing to investigating the possibility of providing service plots.

Furthermore, a critical challenge in the Theewaterskloof Municipality is suitable land for either temporary relocation for upgrading to take place or permanent relocation in cases where in-situ upgrading is not feasible. Theewaterskloof Municipality's Housing Pipeline is summarised in the table below.

Table C.1.2: Housing Pipeline						
Project Name	**Programme**	**Housing Opportunities**	**Project Status**	**Readiness**	**Construction Year**	**Duration**
Caledon						
Caledon Erf 703 (Side Saviwa Hostels)	CRU	80 units	Future	0%	Unknown	2 years
Caledon Erf 1 (Uitzicht)	IRDP	893 sites & 500 units	Future	0%	Unknown	8 years
Caledon Side Saviwa 3 Stage 1 & 2 (Riemvasmaak) (Phase 1)	UISP/IRDP	340 sites & units	Planning	50%	2022/23	5 years
Caledon Erf 1 Site F1 (Phase 2)	IRDP	874 sites	Planning	50%	Beyond 2025	4 years
Caledon Erf 1 (Bergsig)	GAP/FLISP	237 units	Future	30%	Beyond 2025	4 years
Caledon Erf 282 Myddleton	GAP/FLISP	80 sites & units	Future	30%	Beyond 2025	4 years

Table C.1.2: Housing Pipeline						
Project Name	**Programme**	**Housing Opportunities**	**Project Status**	**Readiness**	**Construction Year**	**Duration**
Grabouw						
Grabouw Rooidakke (1169 services)	UISP	1 169 sites	Current	90%	Current	2 years
Grabouw Rooidakke - Rainbow (1169 units)	PHP	1 169 units	Current	90%	Current	3 years
Rooidakke Extension Iraq	UISP (175) IRDP (281)	456 enhanced sites	Current	100%	Current	2 years
Grabouw Hillside (438 services)	UISP	438 sites	Current	100%	Current	2 years
Grabouw Hillside (438 units)	PHP	321 units	Current	100%	Current	2 years
Grabouw Waterworks (Beverly Hills) Erven 505, 545 & 793 (404 services & 404 units) (Phase 2)	UISP	404 sites	Current	50%	Unknown	8 years
Grabouw Waterworks (Beverly Hills)	UISP/PHP	164 sites & units	Current	100%	Unknown	1 year
Grabouw Two A Day	IRDP/FLISP	1 156 sites & units	Future	30%	2021	TBD
Grabouw Gypsie Queen	IRDP/FLISP	300 sites & units	Future	0%	Unknown	TBD
Greater Grabouw (Rooidakke Extension) Portion 1 of the Farm 292 and Portion 4 of Farm 301 (7000 services)	IRDP	TBD	Future	30%	Unknown	TBD
Siyanyanzela	UISP	Unknown	Future	0%	Beyond 2025	TBD
Villiersdorp						
Villiersdorp Farm 24 West Side (195 services)	UISP	195 sites	Future	0%	Unknown	Unknown
Villiersdorp Radyn Farm 24 (120 services & 120 units) and ERF 2819 (Caravan Park - 200 services & 200 units)	IRDP/FLISP	320 sites & units	Future	0%	2020/2021	8 years
Villiersdorp Portions 1, 22, 32 & 72 of Farm 72 (Destiny Farm)	IRDP/UISP	1 816sites & units	Planning	50%	2022/2023	10 years
Villiersdorp Berg en Dal	UIPS	168 In- situ upgrade	Planning	80%	2021/22	1 year
Villiersdorp Farm 24 (Phukom and Goniwe)	UISP	500 sites & units	Future	0%	2023/2024	5 years
Bot River						
Bot River Erf 1351	IRDP/FLISP	25 sites	Future	33%	2023/2024	4 years
Bot River Erf 1212	IRDP/FLISP	26 sites	Future	16%	2023/2024	4 years
Bot River: New Frans Extension (Beaumont Portion 51 or Farm 436) Phase 1	IRDP/UISP	272 sites (TRA 544)	Current	90%	2021/22	1 year
Bot River: New Frans Extension (Beaumont Portion 51 or Farm 436) Phase 2 and 3	IRSP	772 sites & units	Planning	30%	2025 onwards	5 years
Riviersonderend						
Riviersonderend Erf 289 (Joe Slovo)	UISP	172 sites & 138 units	Current	100%	2016/2017	3 years
Riviersonderend Infill	IRDP	11 sites & units	Current	100%	2015/2016	2 years
Riviersonderend Erf 289 Site Phase 1 (224 services)	IRDP	224 sites	Future	0%	Beyond 2025	3 years
Riviersonderend Erf 289 Site Phase 2 (729 services)	IRDP	729 sites	Future	33%	Beyond 2025	TBD
Riviersonderend Erf 459 (200 services & 200 units)	IRDP	200 sites & units	Future	16%	Beyond 2025	5 years
Greyton						
Greyton Erf 595 (GT1) (20 services & 20 units)	GAP/FLISP	127 sites	Future	16%	2023/2024	3 years
Greyton Portion of Erf 595 (phase 1: 165 enhanced sites)	IRDP	TBD	Planning	30%	2022/23	TBD
Greyton Erf 1787 Site Phase 1 (55 services)	GAP/FLISP	55 sites	Future	33%	Beyond 2025	TBD
Greyton Erf1786 Site Phase 2 (19 services)	GAP/FLISP	19 sites	Future	33%	Beyond 2025	TBD
Greyton Erf 595 (GT1) (20 services & 20 units)	GAP/FLISP	20 sites & units	Future	16%	Beyond 2025	TBD
Genadendal						
Genadendal greater Farm 39 (250 services)	IRDP	250 sites	Future	16%	Beyond 2025	12 years

Table C.1.2: Housing Pipeline						
Project Name	**Programme**	**Housing Opportunities**	**Project Status**	**Readiness**	**Construction Year**	**Duration**
Genadendal Erf 1999 Site Phase 1 (16 services)	IRDP	16 sites	Future	16%	Beyond 2025	3 years
Genadendal Erf 1897 Site Phase 2 (20 services)	IRDP	20 sites	Future	16%	Beyond 2025	3 years

All schools and medical facilities in the urban areas of Theewaterskloof Municipality are provided with a higher level of water and sanitation service (Water connection inside the erven and a sewer connection to the waterborne sewer system or serviced with septic or conservancy tanks). The existing service levels (Water and Sanitation) of the primary schools in the rural areas need to be verified. All schools in the rural areas without basic water and sanitation services need to be provided with at least basic services.

TOPIC 2: SERVICE LEVELS

Topic C.2.1: Service Levels Profile						
Section	**Intervention Required?**	**% (1)**	**Solution description as defined by topic situation assessment**	**% (2)**	**Is there an Existing project/activity addressing this problem?**	**Current Demand Overall Scoring % (3)**
Direct Backlog Water	Yes	100.0	Install communal water services for the informal areas in order to ensure that the ratio of number of households per facility complies with the target of 25 or less households per tap.	100.0	Yes	92.9
	Yes	100.0	Assist private landowners as far as possible with the provision of basic water services to all the households in the Municipality's Management Area with existing water service levels below basic water supply services.	100.0	No	57.1
Direct Backlog Sanitation	Yes	100.0	Install communal sanitation services for the informal areas in order to ensure that the ratio of number of households per facility complies with the target of 10 of less households per toilet facility.	100.0	Yes	92.9
	Yes	100.0	Assist private landowners as far as possible with the provision of basic sanitation services to all the households in the Municipality's Management Area with existing sanitation service levels below basic sanitation services	100.0	No	57.1
Water Services Infrastructure Supply Level Profile	No	100.0				100.0
Water Reliability Profile	Yes	100.0	Install communal water services for the informal areas in order to ensure that the ratio of number of households per facility complies with the target of 25 or less households per tap.	100.0	Yes	92.9
	Yes	100.0	Assist private landowners as far as possible with the provision of basic water services to all the households in the Municipality's Management Area with existing water service levels below basic water supply services.	100.0	No	57.1
Sanitation Service Infrastructure Supply Level Profile	No	100.0				100.0
Sanitation Reliability Profile	Yes	100.0	Install communal sanitation services for the informal areas in order to ensure that the ratio of number of households per facility complies with the target of 10 of less households per toilet facility.	100.0	Yes	92.9
	Yes	100.0	Assist private landowners as far as possible with the provision of basic sanitation services to all the households in the Municipality's Management Area with existing sanitation service levels below basic sanitation services	100.0	No	57.1
Water Services: Education	Yes	100.0	Confirm the water service levels of the primary schools in the rural areas. Provide basic water services to the primary schools if the current water service levels are below basic water supply services.	100.0	No	57.1
Water Services: Health	No	100.0				100.0
Sanitation Services: Education	Yes	100.0	Confirm the sanitation service levels of the primary schools in the rural areas. Provide basic sanitation services to the primary schools if the current sanitation service levels are below basic sanitation services.	100.0	No	57.1

Topic C.2.1: Service Levels Profile						
Section	**Intervention Required?**	**% (1)**	**Solution description as defined by topic situation assessment**	**% (2)**	**Is there an Existing project/activity addressing this problem?**	**Current Demand Overall Scoring % (3)**
Sanitation Services: Health	No	100.0				100.0
Health and Educational Facilities	No	100.0				100.0

Notes: (1) Is this section addressed in the WSDP?
(2) Were solutions identified for the possible gaps?
(3) Percentage calculated based on the above two percentages and whether there is an existing project/activity addressing this problem? Does this current listed project/activity address the problem totally? Project/Activity approved by Council as part of WSDP database? Approved by Council in project activity database and part of 5yr IDP cycle projects? Project/Activity listed in 3yr MTEF Cycle?

A separate water and sanitation service level policy is not yet in place, but the water and sanitation service levels to be provided by the Municipality to the consumers in their Management Area are however addressed in the Water and Sanitation Services By-law. All water and sanitation services provided by Theewaterskloof Municipality to consumers within the Municipal Management Area are linked to the Municipality's Tariff Policy and Rates Policy and poor households are incorporated through Theewaterskloof Municipality's Indigent Policy.

The large number of residents in the lowest income groups (living in informal areas) places a major challenge on Theewaterskloof Municipality to provide suitable housing. Theewaterskloof Municipality works towards providing all households in the towns with a water connection inside the erven and connecting all households to a waterborne sanitation system. It is however important to consider the Municipality's capacity (financial and institutional) to operate and maintain complex sewage systems if opting for higher service levels and in particular waterborne sanitation.

Water and Sanitation Services on Privately Owned Land Policy (November 2023)

The roles and responsibilities of the WSA are as follows:

- The role of the WSAs is to comply with the regulatory and support mandates of DWS over provision of water services and resources to residents living on privately owned land.
- WSAs must integrate this policy with their respective local mandates in terms of the Strategic Framework for Water Services.
- WSAs must ensure Water Service Providers perform their responsibilities, which include Operation, maintenance and capital development of water and sanitation services infrastructure outside the boundary and / or within the servitude / of the end user.
- WSAs must identify, register and regulate Water Service Intermediaries / Providers according to their policies, bylaws, national norms and standards.

The roles and responsibilities of the Private Landowner / Water Services Intermediary are as follows:

- Private landowners must provide basic water services to their employees (and the families of employees) living on their land.
- WSAs must ensure that this policy is implemented and must identify, register and regulate water services intermediaries according to their bylaws and national norms and standards.
- Landowners must make an appropriate contribution to the capital cost of basic services.
- While water and sanitation assets, which WSAs install, remain under the ownership of the State, landowners will however have economic rights to the infrastructure once they become intermediaries, and those economic rights will be linked to a contract term.

- Operations and maintenance (and capital development of water and sanitation services on privately owned land) remain the responsibility of property owners.
- The private landowner is encouraged to enter into a contract with the WSA and perform the duties of a Water Services Provider as stipulate din Section 25(1) and (2) of the Water Services Act.
- Private Landowners / Water Services Intermediaries / Water Services Providers should:
  - Support the regulatory and support mandates of DWS over the water services and resources provided to residents living on privately owned land.
  - Integrate and implement this policy in terms of their planning and implementation to ensure compliance with all relevant legislation concerning provision of water services on private land; and to
  - Ensure that this policy is communicated to any person, party or organization affiliated to the "private land" sector.
  - The employers is responsible for providing water and sanitation services to their labourers / employees as per Section 8(1) of the Occupational Health and Safety Act (Act 85 of 1993).

National Sanitation Policy, 2016.

Problem Statement: The ineffectual interpretation and implementation of the Section 78 of the Municipal Systems Act (No. 32 of 2000) process has contributed to municipalities primarily keeping the sanitation provision function in-house, even when the capacity to do so adequately was lacking. They are not appropriately implementing Section 78 provisions. WSAs are not responding to key responsibilities assigned to them in legislation and the SFWS.

Where a WSA has contracted a WSP to provide sanitation services, the responsibility of the two parties is not always clear in the contracts. There is a need for effective contract regulation.

A WSA have the following responsibility:

- Implementation of the Municipal Systems Act (Act 32 of 2000) and Water Services Act (Act 108 of 1997) provisions.
- Prepare sanitation plans such as WSDPs etc., aligned to national sanitation planning.
- Ensure the realisation of the right to access to sanitation services, particularly basic sanitation services, subject to available resources. This includes people living on privately-owned land, in recognised permanent informal settlements and vulnerable groups and others who are provided services by Water Services Intermediaries. Wherever practical and sustainable, Water Services Authorities are expected to plan for and provide higher levels of service.
- Ensure the provision of effective, efficient and sustainable sanitation services. The provision of sanitation services also includes communication activities related to, amongst other things, Hygiene Education, end-user education and the wise use of water.
- Develop an asset management strategy, a maintenance and rehabilitation plan and a register of sanitation services assets and must then put in place a system to manage these assets.
- Provide information concerning the provision of sanitation services as reasonably requested by the Provincial or National governments, end-users and / or organisations.
- Develop an appropriate institutional structure to adequately respond to key WSA functions and responsibilities.
- Account, as per the Municipal Finance Management Act (No. 56 of 2003), to the province and National Treasury for resource allocation (financial, human etc.).
- Provide sanitation hygiene and end user education.

WSAs have a right but not an obligation to accept industrial, agricultural and mining wastewater within their area of jurisdiction.

WSAs must adhere to the following requirements in a transparent manner and in close contact with end-users:

- Sanitation services must be designed, planned and implemented to consider operations and maintenance requirements and to reduce the environmental impact of unmanaged grey-water, human excreta and wastewater disposal.
- Sanitation services must be appropriate and minimise impact on and use of water resources. WSA should strive for systems which utilise minimal water resources.
- Sanitation technologies which consider settlement types.
- Geo-hydrological testing before use of on-site groundwater sources or on-site sanitation services. Exceptional situations may require independent review and advice.
- Technology choices must be appropriate and affordable.
- Roles and responsibility for payments for operations and maintenance must be clear.
- Only appropriate sanitation technologies must be adopted.
- The quality of all building materials used for construction must be durable and fully compliant with the requirements, norms and standards
- Local availability of materials and skills must be part of the choice of technology or construction method. The design of sanitation services facilities must maximise the use of local resources.
- Sanitation technology selection should include resources to develop the necessary local institutional capacity to manage the day to day and future operational needs. In some circumstances there may be considerable merit in engaging a sanitation services provider to carry out certain functions on behalf of a local authority. Government does encourage local authorities to consider various options in this regard.
- Social and cultural practices and preferences should be considered in the selection of appropriate sanitation technology.

WSA must have the billing systems in place to raise sufficient revenue for sanitation services.

WSA must ensure sufficient funds are transferred for a WSP to perform the agreed functions.

WSA must regulate all aspects of sanitation services provision locally.

The WSA is accountable to its citizens.

Sanitation services planning by WSAs should be in conjunction with municipal Environmental Health Practitioners, as well as other stakeholders and departments involved in the sector.

The Revised Compulsory National Water and Sanitation Standards, as published in the Government Gazette No.52814 of 6 June 2025, make provision for the following standards for basic water and sanitation supply services.

Table C.2.2: Basic water and sanitation supply services
Basic water supply services
• A WSA is responsible for the provision of basic water supply services to all consumers or potential consumers in its jurisdictional area inclusive of people residing on privately owned land as guided by the Water and Sanitation Services Policy on Privately Owned Land (2023). • The minimum standard for basic water services must consist of:

Table C.2.2: Basic water and sanitation supply services

Basic water supply services

- Within two years of promulgation of these regulations an access or delivery point which must be at least at the end boundary of the yard (user connection point) of the existing settlement.
- A minimum quantity of drinking water of 6 kl/household per month -
  - at a minimum flow rate of not less than 10 litres per minute.
  - with an effectiveness such that water is made available for at least 358 days per year.
  - not interrupted for longer than 48 consecutive hours.
  - at no cost to indigent households, upon depletion of the initial 6 kl per month allocation, qualifying indigent household will be subject to usage restrictions and will be responsible for payment based on the adopted tariff policy for any additional water consumed.
- Water provided which complies with the requirements of SANS 241.

- Maintenance of the infrastructure up to the user connection is the responsibility of the Water Services Institution and the maintenance of the infrastructure within the boundary of the property is the responsibility of the owner.
- All new users applications for water connections must be completed within 21 calendar days by a WSA in areas where the infrastructure allows or exist.
- All user connections for water supply must be metered or measured, controlled and tariffed by the relevant Water Services Institution.
- A Water Services Institution must replace stolen meters and or repair or replace damaged meters within 30 days of it being reported or detected.
- Water meters must be managed and replaced within their asset lifespan.
- The Water Services Institution must ensure the provision of appropriate education in respect of safe, effective and efficient water use, hygiene and groundwater use management.
- Within two years after promulgation of these Regulations, WSA must submit plans to the Department, using the WSDP platform as part of their WSDP on how they are going to upgrade all consumers in formal settlements to basic services (yard connection; user connection point).

Basic sanitation supply services

- A WSA is responsible for the provision of basic sanitation services to all consumers or potential consumers in its jurisdictional area inclusive of people residing on privately owned land as guided by the Water and Sanitation Services Policy on Privately Owned Land (2023).
- The standard for basic sanitation services must include the provision of a toilet with functional hand washing facility in the yard, which is safe, reliable for 24 hours a day, environmentally sound, easy to keep clean, provides privacy and protection against the weather, well ventilated, keeps smells to a minimum and prevents the entry and exit of flies and other disease-carrying pests, providing for an effective and acceptable sanitation technology.
- A WSA must ensure that human excreta and wastewater is safely contained at all times, throughout the sanitation service chain.
- Faecal sludge management must be an integral part of the sanitation service.
- Each household must have uninterrupted access to an adequate, appropriate sanitation facility.
- Hygiene and user education must be an integral part of sanitation service. Households should be supported with knowledge and any other relevant resources to take responsibility for the correct and consistent use of the sanitation service, including but not limited to the toilet facility.
- In providing basic sanitation service, a WSA must consider the following requirements:
  - The need for everyone, including persons with a disability to have a reasonable quality of life.
  - Water efficient sanitation solutions.
  - Groundwater pollution risks in accordance with the Protocol to manage the potential groundwater contamination from on-site sanitation (2003).
  - Water use authorisation in terms of the NWA.
  - Surface water pollution risks and the management thereof.
  - Population density.
  - Economies of scale.
- Subject to the above, a WSA must consider-
  - In high and medium density formal settlements:
    - waterborne sewered sanitation provided that the wastewater treatment system and works have adequate capacity and is performing to acceptable standards under the National Water Act (read with regulation 10); or
    - alternative water efficient sanitation solutions instead of waterborne sewered systems in areas of dense formal and medium settlement where there is resource scarcity and or inadequate capacity or functionality in the sewer system and or the wastewater treatment works.
  - In low density or sparsely populated settlements: water efficient sanitation solutions.
- Water efficient sanitation solutions, as described above, must be shown to include off-grid, on-site sanitation options such as Non-sewered Sanitation Systems (NSSS) as well as Decentralised Wastewater Treatment Systems (DWWTS).

Table C.2.2: Basic water and sanitation supply services
Basic water supply services
• A WSA may not unreasonably decline a property development to have a water efficient sanitation solution that is not connected to the central system where development will manage the system as a Water Services Intermediary and where the water uses of the system is authorised under the National Water Act. • Whenever a Water Services Institution is providing new innovative non-sewered sanitation systems, such must be guided by the requirements of SANS 30500 for Non-Sewered Sanitation Systems or the "SANS 24521:2020 Guidelines for the management of basic on-site domestic wastewater services", whichever is applicable. • WSA must monitor and regulate safe emptying, transportation, treatment and disposal of faecal sludge to faecal sludge treatment facilities or any other authorised facility. • Faecal sludge treatment plants must be guided by ISO 31800 for prefabricated units or similar standards for non-prefabricated faecal sludge treatment units. • WSA must have community participation procedures of informing communities about the emptying processes, routes and health risks. • Within two years after promulgation of these Regulations, the WSA must submit plans as part of their WSDP, using the WSDP platform, on measures to eradicate unimproved pit toilets and open defaecation in human settlements.

The Revised Compulsory National Water and Sanitation Standards, as published in the Government Gazette No.52814 of 6 June 2025, also make provision for the following standards for interim water and sanitation supply services.

Table C.2.3: Interim water and sanitation supply services
Interim water supply services

• A WSA must take reasonable measures to provide interim water supply services in informal settlements.
• Upon realisation of a new informal settlement, the WSA must provide interim water supply services within 90 days of becoming aware thereof.
• A WSA is responsible for the capital, operation, maintenance and refurbishment actions and cost pertaining to interim water services.
• Where an informal settlement is formalised, a WSA must ensure access to basic water services.
• The minimum standard for interim water services must consist of:
  ➢ An access or delivery point which must be a communal standpipe, within a reasonable walking distance of no more than 200m from the furthest household.
  ➢ A minimum quantity of drinking water of 6 kl/household per month -
  ▪ at a minimum flow rate of not less than 10 litres per minute.
  ▪ with an effectiveness such that water is made available for at least 358 days per year.
  ▪ not interrupted for longer than 48 consecutive hours.
  ➢ Water provided which complies with the requirements of SANS 241.
• All areas supplied with interim water supply services must have zonal meters and measured by the relevant Water Services Institution.
• Whenever interim water supply services are provided through water tankers, it must not exceed 12 consecutive months and WSAs need to keep accurate records as specified in Regulation 4(3)(c).

Interim sanitation supply services

• A WSA is responsible for the capital, operation, maintenance and refurbishment actions and cost pertaining to interim sanitation services including the management of faecal sludge in the entire sanitation service chain.
• A WSA must take reasonable measures to provide appropriate interim sanitation services in informal settlements and during a disaster.
• Upon realisation of a new informal settlement, the WSA must provide interim sanitation services within 90 days.
• Interim sanitation services must provide at least the following:
  ➢ Communal and shared facilities in accordance with the following:
  ▪ Communal toilet: Toilet seat – 1 seat per 10 households; Urinal units – 1 unit per 20 households; Hand washing – 1 basin per 10 households.
  ▪ Shared toilets: Toilet seat – 1 unit per 4 households; Urinal units – 1 unit per 10 households; Hand washing – 1 basin per 4 households.
  ➢ The WSA must put measures in place to keep the toilets hygienic.
  ➢ The toilets must be separated according to gender to meet the needs for women, girls and persons with disability.
  ➢ All portable and mobile toilets must be emptied at least twice a week to appropriate licensed facilities for treatment.
• If the sanitation facility is communal, the maximum walking distance should be 100m, wherever possible.

Table C.2.3: Interim water and sanitation supply services
Interim water supply services
• Parents and care givers must be provided with information by the Water Services Institution regarding safe disposal of infant's faeces, laundering practices and use of nappies, potties or scoops for effectively managing safe disposal. • A WSA through its Environmental Health Practitioners are responsible for promoting hygiene and user education for ensuring an environmentally safe approach to sanitation and for monitoring the impact of sanitation processes on the environment.

Communal standpipes represent probably the weakest part of a network's water supply services. Standpipes must be constructed in ways that can withstand excessive use and should not be neglected in terms of operation and maintenance. Malfunctioning standpipes may adversely affect the health of its already vulnerable and poor users. Communal standpipes are also used by poor households who normally do not pay for water. Poor people are the ones that suffer the most from water-related diseases due to:

- Poor quality and maintenance of standpipes and their surroundings. Standpipes are often leaking and poor drainage around standpipes results in standing pools of water and muddy soil.
- Standpipes are not protected and animals lick the taps.
- When people have to walk long distances to fetch water, it is used sparingly and not enough water is used for hygiene.
- Even if water is clean when it leaves the standpipe tap, it is often contaminated by dirty containers used for carrying and storage.

Theewaterskloof Municipality is committed to support the private landowners as far as possible with regard to addressing the basic water services backlog that might still exist on the farms in the rural areas once the 2022 Census data becomes available for the farms and the locations of households without basic water services are known. Water Service Levels in the WSDP for the farms are based on the 2011 Census data, because the 2022 Census Community Profiles per subplace are not yet available.

The Overberg District Municipality takes various water quality samples on the farms in the rural areas of Theewaterskloof Municipality's Management Area and the water quality information needs to be shared with the private landowners, also the risks associated with storage of water in open reservoirs or tanks and where no filtration or disinfection takes place.

The estimated costs to provide adequate basic water and sanitation services on the farms and interim water and sanitation services in the informal areas are as follows (Households with inadequate services):

- Interim communal water services in the informal areas: R10 380 000
- Basic water services for the households on the farms: R4 440 000
- Interim communal sanitation facilities in the informal areas: R39 325 000
- Basic sanitation services for the households on the farms: R13 200 000

Theft, vandalism, safety, ongoing maintenance (leakages, blockages, etc.) and access problems are only some of the current challenges experienced by the Municipality with regard to the provision of communal water and sanitation services in the existing informal areas.

Theewaterskloof Municipality is also faced with various challenges with regard to the provision of services on private owned land (Farms) in a financial sustainable manner (enabling the on-going operation of services and adequate maintenance and rehabilitation of the assets), which include the following:

<u>Free basic water policy:</u>

- The provision of the infrastructure (facilities) necessary to provide access to water to all households in a sustainable and economically viable manner.
- The development of subsidy mechanisms which benefit those who most need it.

Free basic sanitation policy:

- Provision of the most viable sanitation facility to the poor household.
- Health and hygiene promotion must be provided in a co-ordinated manner and must be properly managed and adequately funded if free basic sanitation is to become a reality. This requires close collaboration between the EHPs of the Overberg District Municipality responsible for environmental health and Theewaterskloof Municipality.
- Subsidising the operating and maintenance costs. If the basic service is to be provided free to the poor then Theewaterskloof Municipality must ensure that the costs of providing the service are covered by the local government equitable share and / or through cross-subsidies within Theewaterskloof Municipality's Management Area.

The ownership of water services assets may be in the hands of the person owning the land where an "on-site" water or sanitation facility is provided to a household. There is no legal impediment to the use of government grants to fund infrastructure for a poor household on private land not owned by that household, provided that the intermediary (the private land owner) makes a financial contribution (This is because the intermediary becomes the owner of the infrastructure once it is installed). Government is looking at specific policies with regard to the appropriate level of contribution.

Theewaterskloof Municipality needs to put the following measures in place with regard to water and sanitation services in their Management Area:

- A Water and Sanitation Service Level Policy needs to be compiled, which is aligned with the requirements of the National Sanitation Policy (2016), Water and Sanitation Services on Privately Owned Land Policy (November 2023) and the Compulsory National Water and Sanitation Services Standards, 2024 (Gazette No.52814, 6 June 2025).
- Theewaterskloof Municipality must comply with the regulatory and support mandates of DWS over provision of water services and resources to residents living on privately owned land.
- Theewaterskloof Municipality must ensure that the "Water and Sanitation Services on Privately Owned Land Policy" is implemented and must identify, register and regulate Water Service Intermediaries / Providers according to their policies, bylaws, national norms and standards.
- Theewaterskloof Municipality must make provision for private landowners to enter into a contract with them to perform the duties of a Water Services Provider as stipulated in Section 25(1) and (2) of the Water Services Act.
- Theewaterskloof Municipality must comply with the Basic water and sanitation supply services requirements as included in Table 2.4 and the Interim water and sanitation supply services requirements as included in Table 2.5 (Compulsory National Water and Sanitation Services Standards, 2024, Gazette No.52814, 6 June 2025).
- Theewaterskloof Municipality must ensure the realisation of the right to access to water and sanitation services, particularly basic water and sanitation services, subject to available resources. This includes people living on privately-owned land, in recognised permanent informal settlements and vulnerable groups and others who are provided services by Water Services Intermediaries. Wherever practical and sustainable, WSAs are expected to plan for and provide higher levels of service.
- Theewaterskloof Municipality must ensure the provision of effective, efficient and sustainable water and sanitation services. The provision of sanitation services also includes communication activities related to, amongst other things, hygiene education, end-user education and the wise use of water.
- Provide information concerning the provision of water and sanitation services as reasonably requested by the Provincial and National governments, end-users and / or organisations.
- Provide sanitation hygiene and end user education.

- Theewaterskloof Municipality must adhere to the sanitation requirements listed on pages 2.6 and 2.7 of the Future Demand and Functionality Requirements WSDP Report in a transparent manner and in close contact with end-users.

- The billing system must make provision for the sufficient raising of revenue for water and sanitation services. Theewaterskloof Municipality must ensure sufficient funds are transferred for a WSP to perform the agreed functions when it becomes applicable.

- Theewaterskloof Municipality must regulate all aspects of water and sanitation services provision locally and is accountable to their citizens.

- The provision or distribution of bucket toilets to communities in both formal and informal settlements are prohibited.

- Theewaterskloof Municipality is prohibited from approving bulk user connections to existing water and wastewater systems without having the necessary capacity to service such user connections. This means that a municipality may not approve new / additional bulk user connections to an existing water or wastewater treatment system unless that system has the capacity to deal with the additional load (ability to operate according to technical specifications).

- Theewaterskloof Municipality may not approve any new developments that will connect to an existing wastewater treatment system unless such a system has the capacity to deal with the load from the development.

- Theewaterskloof Municipality must only accept the quantity and quality of industrial wastewater or any other substance into a sewerage system that the sewage treatment works linked to that system is capable of purifying or treating to ensure that any discharge to a water resource complies with the required authorisation and standard prescribed under the National Water Act.

- Theewaterskloof Municipality shall prescribe pre-treatment of any effluent to the required standard its wastewater treatment systems can process prior to it being disposed into municipal infrastructure.

Public Amenities: All public institutions within the urban areas receive uncontrolled water supply from Theewaterskloof Municipality. The Municipality is committed to keep on providing good quality of water to these public institutions.

All the clinics and hospitals in Theewaterskloof Municipality's Management Area have adequate and safe water and sanitation services. All the schools in the urban areas of Theewaterskloof Municipality's Management Area also have adequate and safe water and sanitation services. **The water and sanitation service levels of the primary schools in the rural areas need to be verified.**

It is important for the schools to focus on Water Demand Management activities and for Theewaterskloof Municipality to support the schools with a WDM programme. This will not only aid in Theewaterskloof Municipality's demand management initiative directly by reducing the water consumption, but the education of learners at a young age regarding wise water use is a key component for sustainable supply in the long term.

TOPIC 3: WATER SERVICES ASSET MANAGEMENT

Table C.3.1: Water Services Asset Management

Section	Intervention Required?	% (1)	Solution description as defined by topic situation assessment	% (2)	Is there an Existing project/activity addressing this problem?	Current Demand Overall Scoring % (3)
General Information	Yes	100.0	Develop an Asset Management Plan.	100.0	No	57.1
Operation	Yes	100.0	Implement recommendations from the Water Safety Plans and WTW Process Audits. Implement proposed interim solutions for improving the operation of the WTW, as well as proposed refurbishment and upgrade and extension work. Ensure adequate budget is allocated for the future upgrading and refurbishment work.	100.0	Partially	85.7
	Yes	100.0	Implement recommendations from the W_2RAPs and WWTW Process Audits. Implement proposed interim solutions for improving the	100.0	Partially	85.7

Table C.3.1: Water Services Asset Management						
Section	**Intervention Required?**	**% (1)**	**Solution description as defined by topic situation assessment**	**% (2)**	**Is there an Existing project/activity addressing this problem?**	**Current Demand Overall Scoring % (3)**
			operation of the WWTW, as well as proposed refurbishment and upgrade and extension work. Ensure adequate budget is allocated for the future upgrading and refurbishment work.			
Functionality Observation	Yes	100.0	Provide additional reservoir storage capacity for the towns with inadequate storage capacity. Upgrade existing water pump stations and provide new water pump stations for the identified areas. Upgrade existing WTWs and WWTWs as recommended. Upgrade existing sewer pump stations and provide new sewer pump stations for the identified areas.	100.0	Partially	85.7
Asset Assessment Spectrum	Yes	100.0	Increase O&M budget for repairs and maintenance of infrastructure. A budget of approximately 2% of the total asset value per annum should be allocated towards the replacement of the existing water and sewerage infrastructure (Best Practice). In the case of operations and maintenance of the system, a budget of approximately 1% to 2% of the value of the system is typically required to ensure that the system remains in good condition (Best Practice).	100.0	Partially	85.7
Water and Sanitation schemes	Yes	100.0	Upgrade sections of the water reticulation network and sewer drainage network as proposed in the Water and Sewer Master Plans.	100.0	Partially	85.7

Notes: (1) Is this section addressed in the WSDP?
(2) Were solutions identified for the possible gaps?
(3) Percentage calculated based on the above two percentages and whether there is an existing project/activity addressing this problem? Does this current listed project/activity address the problem totally? Project/Activity approved by Council as part of WSDP database? Approved by Council in project activity database and part of 5yr IDP cycle projects? Project/Activity listed in 3yr MTEF Cycle?

Asset Management Plan: It is essential for any service delivery organisation to compile an Asset Management Plan (AMP) to ensure efficient, effective and optimal management, operation and maintenance of all assets, which includes treatment plants, reservoirs, structures, buildings, pipelines, sites, etc. The Revised Compulsory National Water and Sanitation Services Standards in terms of Section 9 (1) of the Water Services Act, Act No. 108 of 1997, also require that WSAs have Asset Management Plans in place for all their water and sewerage infrastructure. The purpose of the AMP is to:

- Ensure the operation and maintenance functions are well planned.
- Demonstrate responsible management.
- Justify and communicate funding requirements.
- Service provisioning complies with regulatory requirements.

An AMP normally includes the following:

- documents the nature, extent, age, utilisation, condition, performance and value of the infrastructure work;
- identifies existing and target levels of service, as well as expected changes in demand;
- identifies the life-cycle management needs of the infrastructure (development, renewal, operations and maintenance);
- assesses capital and operational budget needs; and
- identifies infrastructure asset management improvement needs.

Theewaterskloof Municipality needs to differentiate between budget allocated towards the operation and maintenance of the water and sewerage infrastructure and the budget allocated towards the replacement of the water and sewerage infrastructure. A budget of approximately 2% of the total asset value per annum should be allocated towards the replacement of the existing old water and sewerage infrastructure (Best Practice). In the case of operations and maintenance of the system, a budget of approximately 1% to 2% of the value of the system is typically required to ensure that the system remains in good condition (Best Practice).

The objective of an AMP is to support the achievement of the strategic goals of the Municipality and facilitate prudent technical and financial decision-making. It is also a vehicle for improved internal communication and to demonstrate to external stakeholders the Municipality's ability to effectively maintain its existing infrastructure as well as the new infrastructure to be developed over the next 20 years.

Priority should be given to rehabilitating existing infrastructure as this generally makes best use of financial resources and can achieve an increase in (operational) services level coverage most rapidly. The preparation of maintenance plans and the allocation of sufficient funding for maintenance are required to prevent the development of a large condition backlog. The potential renewal projects for water and sewerage infrastructure need to be identified from the Asset Register. All assets with a condition grading of "poor" and "very poor" need to be prioritised.

The Asset Management Plan must be based on the principle of preventative maintenance in order to ensure that, as far as this is practical, damage to assets is prevented before it occurs. Theewaterskloof Municipality must ensure that the maintenance and rehabilitation plan is part of the WSDP and that the plan is implemented. Assets must be rehabilitated and / or replaced before the end of their economic life and the necessary capital funds must be allocated for this purpose.

One of the key challenges of Theewaterskloof Municipality is to identify adequate funds for the rehabilitation and maintenance of their existing infrastructure, which is critical to ensure the sustainability of the services that are provided by the Municipality. It is important for the Municipality to secure adequate funding for major refurbishment and maintenance work, the augmentation of the existing water resources, the provision of bulk water and sewerage infrastructure and the upgrading of the Theewaterskloof WTWs and WWTWs in order to keep up with the high demand for services.

Disaster Management Plan: An approved Disaster Management Policy is in place. The current disaster challenges include the following (2023/2024 Annual Report):

- Funding Limitations: Insufficient funds for large-scale disaster management projects and response efforts.
- Infrastructure Vulnerabilities: Aging infrastructure prone to failure during severe weather events.
- Community Engagement: Ensuring effective participation from the community in disaster preparedness and response initiatives.

Untreated Effluent Management Plan: There are no known untreated effluent discharged to the environment. The W_2RAPs include Management Procedures and Incident Response and Emergency Protocols to respond to incidents. The W_2RAPs need to be updated regularly.

Future Water and Sewerage Infrastructure Requirements: The Water and Sewer Master Plans (September 2019) for the various water distribution and sewer drainage systems in Theewaterskloof Municipality's Management Area recommends upgrades of the water and sewerage infrastructure to the values indicated in the tables below in the foreseeable future in order to accommodate development and population growth according to the SDF.

Table C.3.2: Summary of the future water and sewerage infrastructure requirements for Theewaterskloof Municipality, as included in the Water and Sewer Master Plans

Scheme	Water Infrastructure [1)]	Sewerage Infrastructure [2)]	Total
Bot River	R108 305 211	R60 342 243	R168 647 454
Caledon	R137 152 216	R121 892 354	R259 044 570
Greater Greyton	R18 280 598	R42 922 402	R61 203 000
Greater Genadendal	R40 680 575	R37 973 615	R78 654 190
Grabouw	R152 284 977	R82 697 395	R234 982 372
Riviersonderend	R21 985 628	R12 542 688	R34 528 316
Tesselaarsdal	R6 917 692	R11 577 811	R18 495 503
Villiersdorp	R77 106 727	R37 227 332	R114 334 059
Total	**R562 713 623**	**R407 175 840**	**R969 889 463**

Notes: 1) Include internal water reticulation networks, reservoirs, pump stations, bulk water pipelines and WDM items.
2) Include internal sewerage drainage networks, pump stations, rising mains and bulk sewer pipelines.
Costs include P&G's, Contingencies & Fees, but exclude EIA studies, registration of servitudes and/or land acquisition and VAT.
3) 2019 Water and Sewer Master Plan values were escalated at 6% per annum to 2025 values.

GROUNDWATER INFRASTRUCTURE

Some of the boreholes, as inspected during the WSDP site visits in March and April 2025, require refurbishment and maintenance. Some of the issues to be addressed at the boreholes, as identified through the WSDP inspection process, are as follows.

- Bot River Boreholes: Dip meter was stolen, no level monitoring for the last two years for any of the boreholes.
- Bot River: Current fencing is not adequate for production boreholes No.1, No.3, No.4 and No.5.
- Bot River: Borehole No.2: Borehole is dry and was vandalized, not in use anymore. Current fencing is not adequate.
- Bot River Borehole No.5: Bulk water meter is not operational.
- Bot River: Borehole No. 6: Pump dropped in borehole. Borehole totally vandalized, not operational anymore.
- Caledon: Borehole Ext 12 was vandalised.
- Voorstekraal: Fence of borehole VLBH1 was vandalized. Outlet of chamber of borehole was blocked with leaves and panel was almost under water.
- Bereaville: Borehole was vandalized and is currently not available for supply to Bereaville.

Various groundwater sources were developed by Theewaterskloof Municipality during the 2017/2018 financial year. It is therefore critical for Theewaterskloof Municipality to monitor on a monthly basis (at least) the static water level (i.e. the level prior to commencement of pumping for the day) in each of their production and monitoring boreholes and the volume of water abstracted. Water quality samples also need to be taken on a seasonal or yearly basis. The daily rainfall for the area should also be recorded. This monitoring data should be processed, analysed and reported on by an experienced hydrogeologist in order to ascertain whether the resource is being sustainably utilised or whether groundwater mining is taking place. Managing groundwater for water supply purposes should have the following three main functions:

- Ensure that the aquifer is used optimally: The aquifer should not be over-pumped as that would negatively impact on its long-term sustainable yield or on the environment. It also means that if the aquifer is being under-utilised, this will become known.
- Ensure that the water quality in the aquifer is not negatively affected: This may be as a result of high abstraction from the aquifer, or from poor groundwater protection (from latrines, animal enclosures, etc.).
- Optimise borehole pumping rates so that the pumping equipment operates efficiently: Pumping rates are frequently set too high and this cause unnecessarily high pumping heads, a waste of energy, and at times, pump failure.

An additional function, which is usually captured in the first two points, is to ensure that environmental integrity is maintained. It is important for Theewaterskloof Municipality to focus on aquifer protection, groundwater monitoring and wellfield management, in order to meet the town's future water requirements. The table below gives an overview of the key groundwater management functions.

Table C.3.3: Key Groundwater Management Functions

Activity	Responsible Person	Skills and qualifications required	Resources, tools and equipment	Remarks
Measuring and recording of water levels.	Pump operator	Literacy, numeracy, trained in taking water levels	Dip meter, ruler, log book, pen.	Done as part of operators' regular O&M activities.
Measuring and recording abstraction	Pump operator	Literacy, numeracy, trained in reading water meters.	Log book, pen	Done as part of operators' regular O&M activities.
Providing data to the authority that is responsible for water supply on a regular basis.	Pump operator and pump operator supervisor	Literacy, numeracy, keeping records.	Postal service or public transport.	Including as part of the reporting requirements of the pump operator.

Table C.3.3: Key Groundwater Management Functions				
Activity	**Responsible Person**	**Skills and qualifications required**	**Resources, tools and equipment**	**Remarks**
Taking water samples	The authority that is responsible for water supply.	Trained in taking water samples, driving license.	Transport, sample bottles, cooler box.	Sampling routine defined by sampling plan.
Sending water samples for testing.	The authority that is responsible for water supply.	Keeping records.	Transport to laboratory	Sent to nearest accredited laboratory.
Defining the monitoring requirements of an individual borehole.	Technical manager of operations or hydrogeologist.	Hydrogeological degree or diploma, experience of hydrogeological conditions.	Reports and records on borehole, monitoring data.	
Ensuring that boreholes are equipped with piezometer tubes for measuring water levels and water meters for measuring abstraction.	The authority that is responsible for water supply.	Project management	In house technical staff, suppliers, contractors, specifications.	
Ensuring that operators have the equipment and skills to do monitoring.	The authority that is responsible for water supply.	Project management	Trainers, suppliers, specifications.	
Monitoring the pump operator's competence to collect and record data.	Pump operator supervisor	Staff supervision, knowledge of pump operators' tasks.	Transport	Done as part of the supervision of O&M activities.
Processing data collected at the local level	Data clerk	Data capture, record keeping, filing, trained in operating software.	Computer, spreadsheet or groundwater management software, files.	Maintains an electronic and physical record of data.
Studying water level, water quality and abstraction data on a regular basis.	Technical manager of operations.	Technical training, operations experience.	Project files, monitoring data	Done as part of the management of O&M
Revising pumping recommendations, and adjusting the monitoring requirements. Ensuring the recommendations are carried out and monitoring the implementation of the recommendations.	Technical manager with hydrogeologist as required.	Technical training, operations experience.	Reports and records on borehole, monitoring data, operational information.	Ongoing management of operations and groundwater resources.
Reporting to council and pump operator, providing summary data to the CMA.	Data clerk with supervision from technical manager.	Training in operating software.	Computer, spreadsheet or groundwater management software, printer.	Summary data defined by license (frequency, what data, form of data)

BULK WATER PIPELINE INFRASTRUCTURE

Based on the most likely land-use development scenario, it will be necessary to upgrade the following bulk water pipelines.

Table C.3.4: Future bulk water pipelines required	
Scheme	**Recommended bulk water pipelines**
Bot River	• New 160 mm Ø feeder main from the proposed Bot River Upper PS (located at the Bot River Lower reservoir site) to the proposed Bot River Upper reservoir (Item TBW.B7). • When the existing 160 mm Ø feeder main to the Bot River Lower reservoir reaches capacity it is proposed that the existing 315 mm Ø supply pipe between the Bot River Lower reservoir and the Bot River Lower PS is used as part of the bulk system (the existing 315 mm Ø supply pipe should be used to augment the capacity of the existing 160 mm Ø feeder main). A new 450 mm Ø supply pipeline will then be required from the Lower reservoir to the Bot River Lower PS to replace the existing 315 mm Ø supply pipe (Item TBW.B2).
Caledon	• It is proposed that the existing 200 mm Ø portion of the supply pipelines between the Lower 4,0 Ml reservoir and the Natuurtuin reservoirs is upgraded as a first phase to improve bulk water supply to the Natuurtuin reservoirs (Items TCW.B5, B6 & B8).

Table C.3.4: Future bulk water pipelines required	
Scheme	**Recommended bulk water pipelines**
	• If required in future, the existing 300 mm Ø portion of the supply pipeline to the Natuurtuin reservoirs (and Natuurtuin reservoir network) should as a second phase be augmented through a 450 mm Ø parallel reinforcement pipe (Items TCW.B2, B3 & B4). • When the existing 200/250 mm Ø feeder main between the Natuurtuin PS and the Badskop reservoirs reaches capacity, it is proposed that the line is augmented through a new 315 mm Ø pipe (Item TCW.B12). • A new 160 mm Ø feeder main is proposed from the proposed Blue Crane PS (located at the Badskop reservoir site) to the proposed Blue Crane reservoir (Item TBW.B15). • A new 250 mm Ø feeder main is proposed from the existing Overberg Water infrastructure (on the southern boundary of Bergsig) to the proposed Caledon South reservoir (Item TBW.B20).
Greater Genadendal	• No new feeder mains will be required in the future.
Grabouw	• It is proposed that the existing 100 mm Ø feeder main from the Collin's Kop PS (located at the Grabouw WTP) to the Kollin's Kop reservoir is upgraded with a new 315 mm Ø feeder main (Item TGW.B12). • It is proposed that the existing 315 mm Ø feeder main from the Steenbras PS (located at the Grabouw WTP) to the Steenbras Lower reservoir is transferred in future to the reticulation network of the Steenbras Lower reservoir zone. A new dedicated 500 mm Ø feeder main should then be constructed from the Grabouw WTP to the Steenbras Lower reservoir to replace the existing 315 pipe and to augment the capacity of the existing system to supply bulk water to the Steenbras Lower reservoir (Item TGW.B2). • It is proposed that when the new Steenbras Upper reservoir is constructed it should in the interim (before a dedicated PS and feeder main is constructed for the reservoir) be supplied with water from the existing 250 mm Ø feeder main from the Steenbras High Level PS to the Steenbras High Level reservoir. When the existing bulk supply to the Steenbras Upper and Steenbras High Level reservoir reaches capacity, a new 315 mm Ø feeder main should be constructed between the Steenbras Lower and Steenbras Upper reservoirs (Item TGW.B18). • When the existing 200 mm Ø feeder main between the Uitkyk PS (located on the Steenbras Lower reservoir site) and the Uitkyk reservoirs reaches capacity it is proposed that the line is augmented through a parallel 200 mm Ø pipe (Item TGW.B4).
Greyton	• New 160 mm Ø feeder main from the existing Greyton booster PS to the proposed Greyton Upper reservoir (Item TGGW.B11).
Riviersonderend	• No new feeder mains will be required in the future.
Tesselaarsdal	• No new feeder mains will be required in the future.
Villiersdorp	• New 160 mm Ø dedicated bulk pipeline from the proposed North East PS (located at the Ham Street reservoir site) to the proposed North East reservoir (Item TVW.B9). • New 250 mm Ø dedicated bulk pipeline from the proposed Very High PS (located at the 19 Damme reservoir site) to the proposed Very High reservoir (Item TVW.B6).

The estimated costs for the future bulk water supply pipelines required are indicated in the table below.

Table C.3.5: Cost of future bulk water pipelines required					
Scheme	**New feeder mains that are proposed or existing feeder mains that require upgrading in the future**	**Year**	**Diameter (mm)**	**Length (m)**	**Estimated Cost (VAT Excl.)**
Bot River	When existing bulk supply reaches capacity (required to utilize existing 315 Ø pipe as part of the bulk system)(Item TBW.B1a)	2035	315	12	R144 122
	When existing bulk supply reaches capacity (required to utilize existing 315 Ø pipe as part of the bulk system)(Item TBW.B1b)	2035	315	Valve	R238 311
	When capacity of Bot River Lower reservoir is augmented (Item TBW.B2)	2035	450	312	R2 266 084
	When Bot River Upper reservoir is constructed (Item TBW.B7)	2040	160	337	R615 495
	Sub Total				**R3 264 012**
Caledon	Required when existing bulk supply from Low 4 Ml reservoir nears capacity (TCW.B2)	2025	450	87	R812 670
	Inter-connection between 300 & 450 mm Ø pipes (TCW.B3)	2025	315	7	R123 837
	Required when existing bulk supply from Low 4 Ml reservoir nears capacity (TCW.B4)	2025	450	188	R1 553 278
	Required when existing bulk supply nears capacity (TCW.B5)	2025	400	205	R1 476 111
	New supply pipeline to Natuurtuin reservoir no. 1 (TCW.B6)	2025	315	37	R251 362
	Required to control flow into reservoir (TCW.B7)	2025	110	Valve	R307 819
	New supply pipeline to Natuurtuin reservoir no. 2 (TCW.B8)	2025	315	116	R583 721
	Required to control flow into reservoir (TCW.B9)	2025	110	Valve	R307 819

Table C.3.5: Cost of future bulk water pipelines required					
Scheme	**New feeder mains that are proposed or existing feeder mains that require upgrading in the future**	**Year**	**Diameter (mm)**	**Length (m)**	**Estimated Cost (VAT Excl.)**
	Emergency connection between high & low pressure pipelines (TCW.B10)	2025	355	Valve	R492 510
	Required when supply problems to Badskop reservoir are experienced (Item TCW.B12)	2025	315	1 235	R5 315 049
	Required when new Blue Crane reservoir is constructed (including N2 crossing)(TCW.B15)	2025	160	1 146	R3 370 543
	When Caledon South reservoir is constructed (TCW.B20)	2025	250	35	R181 145
	New dedicated supply pipe to reservoir R3 (RVW.3.3)	2030	355	666	Overberg Masterplan
	Required to augment bulk supply to Caledon and SAB Malsters (RVW.3.5)	2030	400	595	Overberg Masterplan
	Isolate feeder and network pipes (RVW.3.6)	2030	200	Valve	Overberg Masterplan
	Required to augment bulk supply to Caledon and SAB Malsters (RVW.3.7)	2030	400	3 720	Overberg Masterplan
	Required to augment bulk supply to Caledon (second feed from OW) (RVW.3.8)	2035	355	3 832	Overberg Masterplan
	Sub Total				**R14 775 864**
Greater Genadendal	-	-	-	-	-
Grabouw	New dedicated supply to Steenbras reservoir when existing supply nears capacity (TGW.B2)	2027	500	2 112	R17 543 677
	To augment bulk water supply to Uitkyk reservoirs (TGW.B4)	2040	200	524	R1 276 242
	To utilize existing 200 mm dia. pipe as part of the bulk supply to Uitkyk (TGW.B5)	2040	200	Valve	R154 902
	When existing bulk supply to Collins Kop reservoir nears capacity (TGW.B12)	2035	315	165	R792 101
	Dedicated rising main to Steenbras Upper reservoir (TGW.B18)	2045	315	518	R2 286 227
	Sub Total				**R22 053 149**
Greyton	When Greyton Upper reservoir is built (TGGW.B11)	2035	160	373	R673 655
	Sub Total				**R673 655**
Riviersonderend	-	-	-	-	-
Tesselaarsdal	-	-	-	-	-
Villiersdorp	Dedicated bulk supply pipeline to new reservoir (TVW.B6)	2030	250	1 057	R3 354 798
	Required when Villiersdorp North East reservoir is built (TVW.B9)	2035	160	858	R1 473 558
	Sub Total				**R4 828 356**
Total					**R45 595 036**

WATER TREATMENT WORKS INFRASTRUCTURE

The existing hydraulic design capacities, current flows and water quality failures at each of the WTWs are summarised in the table below.

Table C.3.6: Existing capacities, flows and water quality failures at each of the WTWs						
WTW	**Existing Hydraulic Design Capacity**	**Average Daily Flow over Hydraulic Capacity**	**Peak Month Average Daily Flow**	**Average Daily Flow (Jul 2023 – Jun 2024)**	**Required Treatment Capacity (1.5 x AADD10yr)**	**2023/2024 Water Quality Failures (SANS0241:2015) ***
	Ml/d	**%**	**Ml/d**	**Ml/d**	**Ml/d**	
Bot River	1.600	49.9%	0.991 (Dec)	0.799	1.462	Turbidity (Operational), Total Coliform Bacteria
Caledon	2.200	35.0%	0.897 (Jan)	0.769	1.405	Turbidity (Operational), Aluminium, Manganese (Aesthetic), Total Coliform Bacteria
Genadendal	0.300	185.3%	0.800 (Sept)	0.556	1.017	pH, Turbidity (Operational & Aesthetic), Colour, Aluminium, Iron (Aesthetic), Manganese (Aesthetic), E.coli, Heterotrophic Plate Count

Table C.3.6: Existing capacities, flows and water quality failures at each of the WTWs						
WTW	Existing Hydraulic Design Capacity	Average Daily Flow over Hydraulic Capacity	Peak Month Average Daily Flow	Average Daily Flow (Jul 2023 – Jun 2024)	Required Treatment Capacity (1.5 x AADD10yr)	2023/2024 Water Quality Failures (SANS0241:2015) *
	Ml/d	%	Ml/d	Ml/d	Ml/d	
Voorstekraal	0.350	47.7%	0.212 (Jun)	0.167	0.306	E.coli
Bereaville	0.350	43.4%	0.187 (Nov)	0.152	0.278	Total Coliform Bacteria, Free Chlorine
Greyton	0.674	89.5%	0.741 (Aug)	0.603	1.297	pH, Turbidity (Operational & Aesthetic), Colour, Aluminium, Iron (Aesthetic), E.coli, Total Coliform Bacteria, Heterotrophic Plate Count
Grabouw	15.000	47.2%	8.395 (Oct)	7.087	12.958	pH, Turbidity (Operational), Aluminium, Total Coliform Bacteria
Riviersonderend	2.400	42.0%	1.124 (Oct)	1.008	1.567	Turbidity (Operational), Aluminium, E.coli, Total Coliform Bacteria
Tesselaarsdal	Not Applicable	Not Applicable	0.195 (Apr)	0.169	0.309	pH, Turbidity (Operational & Aesthetic), Colour, E.coli
Villiersdorp	2.900	62.8%	1.985 (Jan)	1.821	3.329	pH, Turbidity (Operational & Aesthetic), Colour, Iron (Aesthetic), E.coli

Notes: * Include WTW and water distribution network sample results
Raw water inflow to WTW / Outflow from WTW

The WTWs are all operational , with no major non-functional treatment processes. Some of the treatment processes and operational procedures at the existing WTWs however require improvement, in order to fully comply with the SANS241:2015 water quality limits. Some of the items to be addressed at the WTWs, as identified through the WSDP inspection process during March and April 2025, are as follows.

- Bot River WTW: Current fence around the WTW and reservoirs is not adequate. Dosing building without alarm. Outside lights of building were stolen.
- Genadendal WTW: Fence was vandalised and sections stolen, current fencing is not adequate. No top slab and cover for raw water bulk meter chamber at WTW. Covers of valve and water meter chambers were stolen. No scales for chlorine cylinders, previous scales were stolen. Bermad control valve at WTW not operational and valve not adequately protected in valve chamber.
- Voorstekraal WTW: Current fence around the WTW and reservoir is not adequate.
- Bereaville WTW: Current fence around the WTW and reservoirs is not adequate.
- Greyton WTW: Current fencing is not adequate. Top slabs with lockable covers to be provided for two bulk water meter chambers.
- Grabouw WTW: No roof over Sedimentation Tank No. 3. Overflow plate needed for Sedimentation Tank No.1. Valves of Sedimentation Tanks No.1 and 2 needs to be serviced. Algae problems on walls of filters, which result in bad taste of water (Recommend pre-chlorine). Filter sand levels too low, require new sand. Filters No.7-9, charcoal media, cannot find new media, difficult to maintain filters. General maintenance is lacking at WTW (Varnish of doors, painting of safety rails, maintenance of valves, etc.). Current brick wall around WTW is not adequate. It is easy to gain access to the plant over the wall, electrical fence is needed. Blowers for Filters No.1-6 needs to be serviced. Actuators of Filters No.7-9 all need to be operated manually. MCC for WTW extension is operated manually. Door was vandalized and broken into. Capacity of the backup generator is insufficient. Current security wall and fencing are not adequate.
- Riviersonderend WTW: Current fence is not adequate. Emergency shower was vandalized. Only one rapid gravity sand filter working. No scale for chlorine cylinders. Chlorine extraction fan was stolen. Gas Leak Detector was vandalised. No BA mask in cabinet. Bermad Control Valve was vandalized, now operated manually.
- Tesselaarsdal WTW: No monitoring equipment for any operational sampling.

- Villiersdorp WTW: Backup generator was vandalized. Cables of scales were vandalised, chlorine manifold blocked. Current fence around filter, chlorine building and Ham Street PSs is not adequate (Gate was stolen).

The status with regard to the existing WTW hydraulic capacities and whether it need to be upgraded is as follows:

- The Bot River WTW was operating at 49.9% (AADD) of its design capacity of 1.600 Ml/d for the 2023/2024 financial year. The existing hydraulic capacity of the Bot River WTW is adequate for the short to medium term (Next five to seven years). The capacity will need to be increased with an additional 0.5 Ml/d after 2030.
- The Caledon WTW was operating at 35.0% (AADD) of its design capacity of 2.200 Ml/d for the 2023/2024 financial year. The existing hydraulic capacity of the Caledon WTW is adequate for the long term and no upgrades are required if the total allocation of 6.6 Ml/d from Overberg Water is available for Caledon for future water requirements.
- The Genadendal WTW was operating at 185.3% (AADD) of its design capacity of 0.300 Ml/d for the 2023/2024 financial year. The existing hydraulic capacity of the Genadendal WTW is inadequate and the WTW needs to be upgraded. The current additional treatment capacity required is 0.7 Ml/d. It is recommended that the plant be upgraded to a hydraulic capacity of 1.25 Ml/d.
- The Voorstekraal WTW was operating at 47.7% (AADD) of its design capacity of 0.350 Ml/d for the 2023/2024 financial year. The existing hydraulic capacity of the Voorstekraal WTW is adequate for the short to medium term (Next five to seven years). The capacity will need to be increased with an additional 0.05 Ml/d after 2032.
- The Bereaville WTW was operating at 43.4% (AADD) of its design capacity of 0.350 Ml/d for the 2023/2024 financial year. The existing hydraulic capacity of the Bereaville WTW is adequate for the long term (Next 10 years). The capacity only needs to be upgraded after 2037.
- The Greyton WTW was operating at 89.5% (AADD) of its design capacity of 0.674 Ml/d for the 2023/2024 financial year. The existing hydraulic capacity of the Greyton WTW is inadequate and the capacity will need to be increased with an additional 1.0 Ml/d as soon as possible.
- The Grabouw WTW was operating at 47.2% (AADD) of its design capacity of 15.000 Ml/d for the 2023/2024 financial year. The existing hydraulic capacity of the Grabouw WTW is adequate for the short to medium term (Next five to seven years). The capacity will need to be increased with an additional 3.000 Ml/d after 2032.
- The Riviersonderend WTW was operating at 42.0% (AADD) of its design capacity of 2.400 Ml/d for the 2023/2024 financial year. The existing hydraulic capacity of the Riviersonderend WTW is adequate for the long term (Next 10 to 15 years).
- The Villiersdorp WTW was operating at 62.8% (AADD) of its design capacity of 2.900 Ml/d for the 2023/2024 financial year. The Villiersdorp WTW is currently being upgraded to a hydraulic design capacity of 4.5 Ml/d, which will be adequate for the long term (Next 15 years).

The WTWs to be upgraded in Theewaterskloof Municipality are summarised in the table below.

Table C.3.7: WTWs to be upgraded in the future

WTW	Short, Medium, Long Term	Estimated Cost (Vat Excluded)
Refurbishment work at the Grabouw WTW	2026	R7 500 000
Refurbishment work at the Riviersonderend WTW	2026	R1 500 000
Improve security fencing around WTWs	2026	R5 265 000
Greyton, additional 1.0 Ml/d treatment capacity (Total 1.674 Ml/d)	2026	R25 000 000
Bot River, additional 0.500 Ml/d treatment capacity (Total 2.100 Ml/d).	After 2030	R12 500 000
Genadendal, additional 0.950 Ml/d (Total 1.250 Ml/d)	2026	R23 750 000
Voorstekraal, additional 0.050 Ml/d (Total 0.400 Ml/d)	After 2032	R1 250 000
Grabouw, additional 3.000 Ml/d (Total 18.000 Ml/d)	After 2032	R75 000 000
Total		**R151 765 000**

WATER PUMP STATIONS

Some of the water pump stations, as inspected during the WSDP site visits in March and April 2025, require refurbishment and maintenance. Duty and Standby pumps are not available for all the water pump stations. No major water leaks were observed at any of the water pump stations. Most of the pump stations are adequately fenced and locked and some are supplied with alarms to prevent any possible vandalism or theft. Some of the issues to be addressed at the water pump stations, as identified through the WSDP inspection process, are as follows.

- Bot River: The final water PS building was vandalized and the PS is not operational. The lights were stolen, MCC was damaged and the lifting gear and cables were stolen. High level reservoir cannot be used because of the non-operational PS.
- Caledon: Badskop PS: Fence around reservoirs and PS was vandalised. Alarm of PS building was vandalised and is not operational. The door of the Badskop PS building is in a very poor condition. Only one pump operational, the other pump needs to be connected to the MCC.
- Caledon: Natuurtuin PS: Only one pump operational, no duty/standby.
- Genadendal: Raw water PS (Abstraction from Baviaans River). Only one pump, no duty/standby. Security measures at PS building can be improved.
- Genadendal: Koringlandskloof Booster PS: Only one pump, no duty/standby. The pump was taken in for repairs and the PS was not operational. Pipework in a very poor condition.
- Greyton: Park Street Booster PS: Only one of the two pumps is currently operational.
- Greyton: Vlei Street Raw Water Booster PS: Pump No.1 faulty and only one of the two pumps is currently operational. The door at Vlei Street raw water Booster PS was stolen and needs to be replaced. Bulk flow meters not operational.
- Greyton: Gobos River Sump and Raw Water PS: Only one pump, no duty/standby configuration. No flow meter and the fencing at the PS is not adequate.
- Greyton: Boschmanskloof Booster PS: Currently not in use. The sump needs to be sealed and the Bermad Valve is faulty.
- Grabouw: WTW: Final Water Collinskop PS: One pump was removed for repairs.
- Grabouw: Uitkyk PS: The small pump is not yet operational and the seals of the pumps are leaking.
- Riviersonderend: Raw water PS: The current fencing at the PS and chemical dosing building is not adequate.
- Villiersdorp: 19 Damme Booster PS: Generator was stolen.
- Villiersdorp: Ham Street New PS: Pump No. 1 soft start not working, only pump No.2 operational. Current fencing around filter, chlorine building and Ham Street PSs not adequate.
- Villiersdorp: TW4 Booster PS building: A portion of the razor wire around the building was removed.

Pumps are essential in ensuring provision of water to areas that are higher than the source. In the case of Bot River, Grabouw and Villiersdorp, the informal areas encroach up the hillside above the towns and the new housing developments are sited in these areas (where there is ample space). This of course implies the need for pumping capacity. Based on the most likely land-use development scenario, it will be necessary for the following water pump stations.

Table C.3.8: Future water pump stations required

Scheme	Recommendations included in the Water Master Plan	Year	Capacity (l/s)	Head (m)	Estimated Cost (VAT Excl.)
Bot River	With Implementation of items TBW.B1, TBW.B2 & TBW.B5 (TBW.B9a)	2035	80	25	R3 741 770
	When Bot River Upper reservoir is constructed (TBW.B6)	2040	20	45	R2 551 774
	With implementation of TBW.B5b (when AADD for the lower reservoir zone exceeds 3.5Ml/d) (TBW.B9b)	2050	150	25	R5 221 001
	Sub Total				**R11 514 545**

Table C.3.8: Future water pump stations required					
Scheme	**Recommendations included in the Water Master Plan**	**Year**	**Capacity (l/s)**	**Head (m)**	**Estimated Cost (VAT Excl.)**
Caledon	To augment supply to Badskop reservoir (TCW.B11)	2025	100	65	R1 355 253
	Required when new Blue Crane reservoir is constructed (TCW.B14)	2025	20	70	R2 625 821
	Required to augment bulk supply to Caledon and SAB Malsters (RVW.3.2)	2030	130	140	Overberg Masterplan
	Sub Total				**R3 981 074**
Greater Genadendal	-	-	-	-	-
Grabouw	When existing bulk supply nears capacity, can be phased (TGW.B1)	2027	280	50	R9 000 362
	When existing bulk supply nears capacity (TGW.B3)	2040	70	50	R3 800 922
	When existing PS reaches capacity (TGW.B16)	2045	120	60	R1 458 805
	Sub Total				**R14 260 089**
Greyton	-	-	-	-	-
Riviersonderend	-	-	-	-	-
Tesselaarsdal	-	-	-	-	-
Villiersdorp	Required when new Very High reservoir is built (TVW.B5)	2030	40	40	R3 003 147
	Required when Villiersdorp North East reservoir is built (TVW.B8)	2035	12	75	R2 410 773
	Sub Total				**R5 413 920**
Some water PSs	Improved security measures at water PSs (2026)				**R726 000**
Total					**R35 895 628**

RESERVOIR INFRASTRUCTURE

The condition of most of the reservoirs in Theewaterskloof Municipality's Management Area is good. Not all the reservoirs are adequately fenced and locked and some of the reservoir covers are not locked. The issues to be addressed at the reservoirs, as identified through the WSDP site inspections, are as follows.

- Bot River: The cover of the 3.000 Ml High Level Reservoir is not locked. The level probe was stolen and the reservoir level is checked manually. Fence was vandalised and stolen. The reservoir is not in use, due to the vandalized PS at the WTW.
- Bot River: Low Level Reservoirs: The cover of the 0.227 Ml Reservoir No. 3 is not locked. The asbestos roof of the 0.227 Ml Reservoir No. 2 is broken in some sections. The current fencing around the WTW and the three reservoirs is not adequate.
- Caledon: The fence at the 0.250 Ml Myddleton Reservoir was stolen and the air vents are open. The valve chamber is without a cover.
- Caledon: The fencing at both the Bads Kop Reservoirs were vandalized and the reservoir covers are not locked.
- Caledon: The Hospital 0.227 Ml Reservoir is not fenced and the covers are not locked.
- Caledon: The Natuurtuin Reservoirs are not fenced and the covers not locked.
- Caledon: The covers at the 4.000 Ml Low Zone Reservoir is not locked.
- Genadendal: The fence around the WTW and the Reservoir was stolen and vandalized and the current fencing is not adequate. The reservoir is also leaking, because of constant flow from the sub-drains.
- Voorstekraal: The locking mechanism of the inspection cover at the 0.075 Ml Reservoir was stolen. The current fencing around the WTW and reservoir is not adequate.
- Bereaville: The cover at the 0.250 Ml Reservoir was open and unlocked.
- Greyton: The covers of the reservoirs are not locked, and the one air vent at the 0.500 Ml Reservoir is open. The current fencing around the WTW and the reservoirs is not adequate.
- Greyton: The fencing at the Boschmanskloof Reservoir terrain is not adequate.

- Grabouw: Uitkyk reservoirs terrain is not fenced. Informal structures against the reservoirs. The valve chamber is without covers and the head of one of the reservoir outlet valves was vandalized, which resulted in water wastage over a long period.
- Grabouw: The Upper Steenbras Reservoir terrain is not fenced. The grid over one of the air vents was removed and a rock placed on the reservoir opening to prevent access.
- Riviersonderend: The 1.300 Ml and 5.000 Ml Riviersonderend Reservoirs were overflowing at the time of the site visit, because of the vandalized Bermad Control Valve at the WTW. The covers of the reservoirs are not locked.
- Tesselaarsdal: The reservoir covers are not locked.
- Villiersdorp: The cover at the 19 Damme 2.000 Ml reservoir is not locked.
- Villiersdorp: Three high level reservoirs: The reservoirs terrain is not fenced. Proper meter chambers, with lockable covers, need to be constructed for the bulk water meters at the reservoirs.

Theewaterskloof Municipality's overall storage factors of the reservoirs for the various towns for 2023/2024, based on 1 x PDD (24 hours storage capacity), are 2.22 for Bot River, 1.91 for Caledon, 0.89 for Genadendal (Bereaville and Voorstekraal included), 1.23 for Grabouw, 1.98 for Greyton (Boschmanskloof included), 2.05 for Riviersonderend, 0.92 for Tesselaarsdal and 1.54 for Villiersdorp. It can be noted form these storage factors that the towns with the lowest storage factors are Genadendal and Tesselaarsdal.

Even though the town's overall storage capacity might be adequate there might be some distribution zones within the town's network with inadequate storage capacity, as identified through the Water Master Planning process (2019) and indicated in the table below.

Table C.3.9: Future reservoir storage capacities required

Scheme	Recommendations included in the Water Master Plan	Year	Capacity (Ml)	Estimated Cost (VAT Excl.)
Bot River	When Bot River AADD exceeds 1.5 Ml/d (TBW.B5a)	2035	4.000	R17 436 437
	Required when high lying areas develop (TBW.B8)	2040	2.000	R10 604 849
	When Bot River AADD exceeds 3.5 ML/d (TBW.B5b)	2050	4.000	R17 436 437
	Sub Total			**R45 477 723**
Caledon	To provide Reservoir storage capacity for future areas (TCW.B13)	2025	4.000	R17 436 437
	To provide reservoir storage capacity for future areas (TCW.B16)	2025	1.500	R8 792 691
	New reservoir for Riemvasmaak and Uitsig housing developments in Caledon South (TCW.B19a)	2025	5.000	R20 157 157
	When AADD of zone exceeds 2 Ml/d (TCW.B19b)	2025	5.000	R20 157 157
	Additional balancing volume at reservoir R2 (RVW.3.1)	2030	3.500	Overberg Masterplan
	Required to augment bulk supply to Caledon and SAB Malsters (RVW.3.4)	2030	6.000	Overberg Masterplan
	Sub Total			**R66 543 442**
Greater Genadendal	Voorstekraal: When existing reservoir storage reaches capacity (when AADD exceeds 37.5 kl/d) (TGGW.B4)	2025	0.500	R4 259 813
	Bereaville: When AADD exceeds 125 kl/d (TGGW.B16)	2025	0.500	R4 259 813
	Genadendal: When existing reservoir storage reaches capacity (when AADD exceeds 920 kl/d) (TGGW.B15)	2035	1.500	R8 792 691
	Sub Total			**R17 312 317**
Grabouw	When Steenbras Very High reservoir reaches capacity, can be phased (TGW.B10)	2030	6.500	R24 483 214
	To provide reservoir storage capacity for FDA's G22.2, G34, G35 & G36 (TGW.B14)	2035	1.000	R6 672 714
	When existing reservoir storage nears capacity (TGW.B19)	2045	3.000	R14 060 361
	Sub Total			**R45 216 289**
Greyton	To provide sufficient reservoir storage capacity for existing erven (TGGW.B13)	2030	0.800	R5 767 131
	New reservoir to replace existing Greyton booster zone (TGGW.B12)	2035	0.800	R5 767 131
	Sub Total			**R11 534 262**

Table C.3.9: Future reservoir storage capacities required				
Scheme	**Recommendations included in the Water Master Plan**	**Year**	**Capacity (Ml)**	**Estimated Cost (VAT Excl.)**
Riviersonderend	To provide reservoir storage capacity for future areas, when AADD exceeds 1650 kl/d (TRW.B1)	2035	2.000	R10 604 849
	Sub Total			**R10 604 849**
Tesselaarsdal	To provide reservoir storage capacity for future areas, when AADD exceeds 173 kl/d (TTW.B1)	2025	0.500	R4 259 813
	Sub Total			**R4 259 813**
Villiersdorp	New reservoir for high lying future areas (TVW.B7)	2025	3.200	R14 788 062
	When FDA's V6, V7 & V8 develops (TVW.B10)	2035	1.000	R6 672 714
	Augment Ham Street reservoir storage capacity, when AADD of zone exceeds 1500 kl/d (TVW.B12)	2040	4.500	R18 878 787
	Sub Total			**R40 339 563**
Some reservoirs	New security fencing for reservoirs (2026)			**R3 900 000**
Total				**R245 188 258**

WATER RETICULATION INFRASTRUCTURE

Based on the most likely land-use development scenario, it will be necessary for the following water reticulation infrastructure.

Table C.3.10: Future water reticulation infrastructure required			
Scheme	**Project No.**	**Year**	**Estimated Cost (VAT Excl.)**
Bot River	TBW-PRJ-001	2025	R2 148 205
	TBW-PRJ-002	2026	R2 203 386
	TBW-PRJ-003 & TBW-PRJ-005 & TBW-PRJ-013	2030	R13 008 246
	TBW-PRJ-004 & TBW-PRJ-006	2035	R5 394 912
	TBW-PRJ-006 & TBW-PRJ-007 & TBW-PRJ-011 & TBW-PRJ-012 & TBW-PRJ-013	2040	R16 881 654
	TBW-PRJ-006 & TBW-PRJ-008	2045	R2 629 083
	TBW-PRJ-006	2050	R1 843 933
	TBW-PRJ-006	2055	R2 237 288
	Sub Total		**R46 346 707**
Caledon	TCW-PRJ-005 & TCW-PRJ-006 & TCW-PRJ-008 & TCW-PRJ-010 & TCW-PRJ-013 & TCW-PRJ-014 & TCW-PRJ-015 & TCW-PRJ-016	2025	R45 236 858
	Sub Total		**R45 236 858**
Greater Genadendal	TGGW-PRJ-007 & TGGW-PRJ-009 & TGGW-PRJ-010 & TGGW-PRJ-011	2030	R8 968 871
	TGGW-PRJ-008 & TGGW-PRJ-010 & TGGW-PRJ-015	2035	R9 870 340
	TGGW-PRJ-014	2040	R1 728 891
	Sub Total		**R20 568 102**
Grabouw	TGW-PRJ-001 & TGW-PRJ-002	2025	R8 529 414
	TGW-PRJ-003 & TGW-PRJ-014 & TGW-PRJ-025	2026	R8 997 950
	TGW-PRJ-026	2027	R1 518 525
	TGW-PRJ-002 & TGW-PRJ-015	2028	R2 108 345
	TGW-PRJ-020	2029	R355 481
	TGW-PRJ-007 & TGW-PRJ-009 & TGW-PRJ-012	2030	R10 781 455
	TGW-PRJ-007 & TGW-PRJ-012 & TGW-PRJ-015 & TGW-PRJ-016 & TGW-PRJ-017 & TGW-PRJ-024	2035	R14 237 534
	TGW-PRJ-001 & TGW-PRJ-017 & TGW-PRJ-023	2040	R12 273 453
	TGW-PRJ-011 & TGW-PRJ-016 & TGW-PRJ-017	2045	R9 896 440
	Sub Total		**R68 698 597**
Greyton	TGGW-PRJ-001	2025	R2 810 796
	TGGW-PRJ-002 & TGGW-PRJ-013	2030	R2 023 801
	TGGW-PRJ-006	2035	R1 096 232

Table C.3.10: Future water reticulation infrastructure required			
Scheme	**Project No.**	**Year**	**Estimated Cost (VAT Excl.)**
	Sub Total		**R5 930 829**
Riviersonderend	TRW-PRJ-002	2030	R4 999 571
	TRW-PRJ-003	2035	R1 384 617
	TRW-PRJ-004	2040	R4 216 406
	Sub Total		**R10 600 594**
Tesselaarsdal	TTW-PRJ-003	2035	R2 090 472
	Sub Total		**R2 090 472**
Villiersdorp	TVW-PRJ-001	2025	R1 612 431
	TVW-PRJ-002	2025	R4 010 721
	TVW-PRJ-006	2027	-
	TVW-PRJ-003 & TVW-PRJ-005 & TVW-PRJ-006 & TVW-PRJ-008 & TVW-PRJ-009 & TVW-PRJ-012	2030	R9 229 169
	TVW-PRJ-002 & TVW-PRJ-004 & TVW-PRJ-007 & TVW-PRJ-010	2035	R10 324 975
	Sub Total		**R25 177 296**
Total			**R224 649 455**

SEWER PUMP STATIONS

Most of the sewer pump stations are fenced and locked. Not all the sewer pump stations are supplied with duty and standby pumps. Key issues to be addressed at the sewer pump stations, as identified through the WSDP inspection process in March and April 2025, are as follows.

- Bot River: The motion sensor on one of the sides of the Bot River Sewer PS building is not working. Pump No. 2 is not operational due to a fault with the bend.
- Genadendal: Main sewer PS: The PS is not fenced, but the control panel is inside a steel cage. One of the two pumps is in for repairs.
- Genadendal: The Gliebeland PS is not operational for a long period of time, which leads to the pollution of the river due to overflow at the manhole upstream of the PS.
- Genadendal: Emil Weder PS: The current fencing is not adequate. The electrical panel is inside a cage but was previously vandalised. The PS is currently not operational and the sump is emptied by tankers.
- Genadendal: The Paglande Sewer PS is not fenced.
- Voorstekraal: The fence around the Voorstekraal PS was vandalised. There is only one pump.
- Grabouw: The Molteno sewer PS is not adequately fenced.
- Grabouw: Pineview PS: The backup generator is not working for the last five years. Sections of the wall around the PS were broken down and the current fencing is not adequate. The sand grit removal system is not operational, because the cables were vandalised.
- Riviersonderend: The current fencing at the Hoop Street PS is not adequate and the PS only has one pump.
- Riviersonderend: The current fencing at the Alpha Street sewer PS is not adequate. It is difficult to remove the pump when the pump is faulty. A new DB is required and there is only one pump. The screenings basket was removed.
- Riviersonderend: Disa Street sewer PS: PS building without security gates and the current wooden doors are in a poor condition. Sections of the fence around the PS building not adequate.
- Riviersonderend: Only one pump at the Jo-Slovo sewer PS is working and it is difficult to remove the pumps when faulty.
- Villiersdorp: The Industrial sewer PS only has one pump. Spillage at the PS during the time of the site visit, due to the pump that tripped.

Based on the most likely land-use development scenario, it will be necessary for the following new sewer pump stations, as well as upgrading of the existing sewer pump stations.

Table C.3.11: Future sewer pump stations required			
Town	**Recommendations included in the Sewer Master Plan**	**Year**	**Estimated Cost (VAT Excl.)**
Bot River	New bulk PS for southern areas in Bot River (TBS.4.4)	2045	R1 224 324
	New PS when future areas B23 - B25 develop (TBS.5.2)	2050	R727 417
	Sub Total		**R1 951 741**
Caledon	When future areas C21 & C22 develop (TCS.2.1)	2045	R726 282
	Sub Total		**R726 282**
Greater Genadendal	Upgrade PS when existing PS reaches capacity (TGGS.2.6)	2045	R617 340
	Abandon existing pump station and rising main when new bulk sewer is constructed (TGGS.4.4)	2050	R285 973
	New Bulk PS for Genadendal to replace West and Main pump stations 50 l/s (TGGS.3.4)	2050	R968 139
	Sub Total		**R1 871 452**
Grabouw	Abandon existing pump station and rising main when new bulk sewer is constructed (TGS.6.1)	2030	R285 973
	Upgrade PS capacity to 40 l/s (TGS.7.1)	2030	R321 295
	Abandon existing pump station and rising main when new bulk sewer is constructed (TGS.5.1)	2035	R285 973
	New bulk PS when flow from the Pineview PS is redirected to Palmiet PS 180 l/s (TGS.7.2)	2035	R2 945 129
	New PS when future area G34 develops (TGS.8.1)	2045	R753 659
	Sub Total		**R4 592 029**
Greyton	-	-	-
Riviersonderend	Abandon existing PS when new bulk PS for Riviersonderend is constructed (TRS.3.4)	2035	R285 973
	Abandon existing PS when new bulk PS for Riviersonderend is constructed (TRS.3.6)	2035	R285 973
	New bulk PS for Riviersonderend 40 l/s (TRS.3.11)	2035	R1 157 795
	Upgrade existing PS when existing pump station reaches capacity (TRS.2.8)	2040	R759 191
	Upgrade existing PS when existing pump station reaches capacity (TRS.1.3)	2045	R576 486
	Sub Total		**R3 065 418**
Tesselaarsdal	-	-	-
Villiersdorp	Pump station under construction (TVS.2.9)	2025	R0
	New PS when future areas V3 & V4 develop (TVS.3.1)	2030	R888 702
	Sub Total		**R888 702**
Some sewer PSs	New security fencing for sewer PSs (2026)		**R1 350 000**
Total			**R14 445 624**

BULK SEWER PIPELINE AND SEWER DRAINAGE NETWORK INFRASTRUCTURE

Based on the most likely land-use development scenario, it will be necessary for the following bulk sewer pipeline and sewer drainage network infrastructure.

Table C.3.12: Future bulk sewer pipeline and sewer drainage network infrastructure required				
Scheme	**Component**	**Project No.**	**Year**	**Estimated Cost (VAT Excl.)**
Bot River	Distribution	TBS-PRJ-006	2026	R3 404
		TBS-PRJ-010	2027	R17 024 641
		TBS-PRJ-005 & TBS-PRJ-007 & TBS-PRJ-008	2035	R10 950 968
		TBS-PRJ-003 & TBS-PRJ-004	2045	R4 937 581
		TBS-PRJ-009	2050	R2 461 414

Table C.3.12: Future bulk sewer pipeline and sewer drainage network infrastructure required				
Scheme	**Component**	**Project No.**	**Year**	**Estimated Cost (VAT Excl.)**
	Rising Main	669 m x 250 mm Ø New Rising when Bot River future PS B1 is constructed (TBS-PRJ-004)	2045	R1 928 619
		1051 m x 200 mm Ø New Rising when Bot River future PS B2 is constructed (TBS-PRJ-009)	2050	R2 261 687
	Bulk Sewer	1026 m x 450 mm Ø and 354 m x 400 mm Ø New Gravity for southern areas (TBS-PRJ-002)	2040	R11 924 781
		330 m x 355 mm Ø and 485 m x 355 mm Ø New Gravity for southern areas (TBS-PRJ-003)	2045	R3 967 882
	Sub Total			**R55 460 977**
Caledon	Distribution	TCS-PRJ-005 & TCS-PRJ-009	2028	R22 230 039
		TCS-PRJ-006 & TCS-PRJ-010 & TCS-PRJ-011 & TCS-PRJ-012	2030	R13 154 921
		TCS-PRJ-008 & TCS-PRJ-013 & TCS-PRJ-014	2035	R9 560 393
		TCS-PRJ-014	2040	R472 934
		TCS-PRJ-007	2045	R495 347
		TCS-PRJ-004	2050	R1 963 656
	Rising Main	461 m x 110 mm Ø New Rising when future PS C1 is constructed (TCS-PRJ-007)	2045	R578 330
	Bulk Sewer	770 m x 250 mm Ø; 349 m x 355 mm Ø; 1130 m x 355 mm Ø; 349 m x 355 mm Ø and 429 m x 355 mm Ø Upgrade existing Gravity to replace existing sewers (TCS-PRJ-003)	2030	R14 724 938
	Sub Total			**R63 180 558**
Greater Genadendal	Distribution	TGGS-PRJ-003 & TGGS-PRJ-004	2025	R3 897 381
		TGGS-PRJ-001 & TGGS-PRJ-007	2040	R24 217 668
		TGGS-PRJ-002 & TGGS-PRJ-008	2045	R4 994 748
		TGGS-PRJ-003	2050	R861 892
	Rising Main	Abandon existing pump station and rising main when new bulk sewer is constructed (TGGS-PRJ-003)	2050	R9 788
	Bulk Sewer	737 m x 250 mm Ø New Rising when new bulk PS is constructed (TGGS-PRJ-003)	2050	R2 120 686
	Sub Total			**R36 102 163**
Grabouw	Distribution	TGS-PRJ-003 & TGS-PRJ-009	2025	R5 700 745
		TGS-PRJ-005	2026	R1 399 795
		TGS-PRJ-004	2027	R3 721 059
		TGS-PRJ-006	2028	R6 505 896
		TGS-PRJ-001 & TGS-PRJ-006	2030	R2 238 991
		TGS-PRJ-002	2035	R834 089
		TGS-PRJ-010	2040	R4 665 226
		TGS-PRJ-008 & TGS-PRJ-009 & TGS-PRJ-011 & TGS-PRJ-012	2045	R14 491 449
	Rising Main	Abandon existing rising main (TGS-PRJ-001)	2030	-
		Abandon existing rising main (TGS-PRJ-002)	2035	-
		621 m x 90 mm Ø New Rising when future PS G1 is constructed (TGS-PRJ-007)	2045	R719 898
	Bulk Sewer	916 m x 675 mm Ø and 1635 m x 675 mm Ø New Gravity sewer for Grabouw (TGS-PRJ-001)	2030	R24 443 921
		827 m x 675 mm Ø New Gravity required when Pineview PS reaches capacity and 678 m x 500 mm Ø New Rising when new bulk Palmiet PS is constructed (TGS-PRJ-002)	2035	R13 384 295
	Sub Total			**R78 105 364**
Greyton	Distribution	TGGS-PRJ-009	2025	R1 041 051
		TGGS-PRJ-005	2030	R3 974 265
		TGGS-PRJ-005	2032	R1 967 912
		TGGS-PRJ-005	2033	R18 082 431
		TGGS-PRJ-005	2035	R17 856 744
	Sub Total			**R42 922 402**

Table C.3.12: Future bulk sewer pipeline and sewer drainage network infrastructure required				
Scheme	**Component**	**Project No.**	**Year**	**Estimated Cost (VAT Excl.)**
Riviersonderend	Distribution	TRS-PRJ-001	2030	R3 194 079
		TRS-PRJ-002	2035	R1 125 028
		TRS-PRJ-003	2040	R3 078 328
	Rising Main	Abandon existing rising mains and 675 m x 200 mm Ø New Rising when new bulk PS and rising main are constructed (TRS-PRJ-002)	2035	R1 482 778
		425 m x 110 mm Ø Upgrade existing Rising when existing PS reaches capacity (TRS-PRJ-004)	2045	R597 055
	Sub Total			**R9 477 268**
Tesselaarsdal	Distribution	TTS-PRJ-001	2040	R11 577 811
	Sub Total			**R11 577 811**
Villiersdorp	Distribution	TVS-PRJ-005	2025	R889 553
		TVS-PRJ-006	2026	R2 659 865
		TVS-PRJ-008	2027	R2 971 939
		TVS-PRJ-001 & TVS-PRJ-007 & TVS-PRJ-010 & TVS-PRJ-012	2030	R11 879 105
		TVS-PRJ-009	2035	R2 646 389
		TVS-PRJ-002	2040	R4 100 655
		TVS-PRJ-003 & TVS-PRJ-010	2045	R4 130 586
		TVS-PRJ-004	2050	R1 970 465
	Rising Main	1089 m x 250 mm Ø New Rising required to service Destiny Farm Development (TVS-PRJ-005)	2025	R3 116 912
		915 m x 200 mm Ø New Rising when future areas V3 & V4 develop (TVS-PRJ-011)	2030	R1 973 160
	Sub Total			**R36 338 629**
Total				**R333 165 172**

WASTE WATER TREATMENT INFRASTRUCTURE

The table below gives a summary of the existing hydraulic design capacities and current flows at each of the WWTWs, as well as the final effluent quality compliance percentages for the 2023/2024 financial year.

Table C.3.13: Existing hydraulic design capacities, flows and final effluent compliance percentages at each of the WWTWs						
WWTW	**Existing Hydraulic Capacity**	**Average Daily Flow (2023/2024)**	**Average Daily Flow as a % of Design Capacity**	**Peak Month Average Daily Flow**	**Average Wet Weather Flow (Jun'24, Jul'23, Aug'23)**	**Final Effluent Compliance for 2023/2024 against *Authorisation***
	Ml/d	**Ml/d**	**%**	**Ml/d**	**Ml/d**	
Bot River	1.050	0.281	26.8%	0.366 (Sept)	0.268	Microbiological: 36.4% Chemical: 68.3% Physical: 87.9% *General Limits*
Caledon	4.000	2.387	59.7%	2.970 (Jun)	2.817	Microbiological: 8.3% Chemical: 58.3% Physical: 75.0% *Licence 02/G40F/FG/6675 (6 February 2018)*
Genadendal	0.720	0.267	37.1%	0.609 (Jun)	0.311	Microbiological: 30.0% Chemical: 28.1% Physical: 73.3% *General Limits*
Greyton	0.500	0.232	46.4%	0.284 (Apr)	0.270	Microbiological: 44.4% Chemical: 78.6% Physical: 81.5% *Licence 02/H60F/CEFGI/12692 (10 March 2023)*
Grabouw	8.500	3.577	42.1%	4.865 (Aug)	4.448	Microbiological: 9.1% Chemical: 6.1%

Table C.3.13: Existing hydraulic design capacities, flows and final effluent compliance percentages at each of the WWTWs						
WWTW	**Existing Hydraulic Capacity**	**Average Daily Flow (2023/2024)**	**Average Daily Flow as a % of Design Capacity**	**Peak Month Average Daily Flow**	**Average Wet Weather Flow (Jun'24, Jul'23, Aug'23)**	**Final Effluent Compliance for 2023/2024 against *Authorisation***
	Ml/d	**Ml/d**	**%**	**Ml/d**	**Ml/d**	
						Physical: 69.7% *Licence 19/G40C/FG/2821 (18 December 2015)*
Riviersonderend	0.700	0.733	104.7%	1.362 (Oct)	0.808	Microbiological: 100.0% Chemical: 100.0% Physical: 95.5% *General Limits (Irrigation)*
Tesselaarsdal	0.043	0.004*	9.3%	Unknown	Unknown	Microbiological: 60.0% Chemical: 40.0% Physical: 53.3% *General Limits*
Villiersdorp	2.500	2.041	81.6%	3.027 (Mar)	1.915	Microbiological: 8.3% Chemical: 11.4% Physical: 66.7% *Licence 18/H60C/FG/3482 (31 July 2019)*

Note: * WWTW inflow estimated from billed metered consumption

The organic design capacities of the WWTWs and the current loadings at the WWTWs are indicated in the table below.

Table C.3.14: Existing organic design capacities and loadings at the WWTWs						
WWTW	**2022/2023**			**2023/2024**		
	Organic Design Capacity	**Average Load**	**% of Design Capacity**	**Organic Design Capacity**	**Average Load**	**% of Design Capacity**
	kg COD/d	**kg COD/d**	**%**	**kg COD/d**	**kg COD/d**	**%**
Bot River	1 139	286	25.1%	1 139	341	29.9%
Caledon	2 294	2 152	93.8%	5 433	4 005	73.7%
Genadendal	1 025	316	30.8%	1 025	212	20.7%
Greyton	Unknown	165	Unknown	635	188	29.6%
Grabouw	7 192	4 317	60.0%	7 192	4 357	60.6%
Riviersonderend	Unknown	462	Unknown	Unknown	313	Unknown
Tesselaarsdal	39.6	3	7.6%	39.6	2	5.1%
Villiersdorp	2 125	1 338	63.0%	2 125	3 039	143.0%

The projected future WWTW flows are included in the future water requirement projection models. The table below gives an overview of the average daily future projected WWTW flows.

Table C.3.15: Average daily and peak month future projected WWTW flows (Ml/d)											
WWTW	**Existing Hydraulic Capacity**	**Average Daily Future Projected WWTW Flows**					**Peak Month Average Daily Future Projected WWTW Flows**				
		2028	**2033**	**2038**	**2043**	**2048**	**2028**	**2033**	**2038**	**2043**	**2048**
Bot River	1.050	0.389	0.589	0.782	1.021	1.168	0.486	0.736	0.978	1.276	1.459
Caledon	4.000	3.048	3.754	4.566	4.952	5.387	3.810	4.692	5.707	6.190	6.734
Genadendal	0.720	0.487	0.570	0.653	0.735	0.728	0.609	0.713	0.816	0.919	0.909
Greyton	0.500	0.271	0.352	0.439	0.536	0.642	0.339	0.440	0.549	0.670	0.802
Grabouw	8.500	6.090	8.063	9.950	12.265	14.311	7.612	10.079	12.437	15.331	17.889
Riviersonderend	0.700	0.794	0.945	1.121	1.327	1.484	0.992	1.181	1.401	1.659	1.855
Tesselaarsdal	0.043	0.030	0.047	0.066	0.086	0.144	0.034	0.054	0.075	0.099	0.166
Villiersdorp	2.500	1.861	2.132	2.597	3.155	3.622	2.237	2.665	3.246	3.943	4.527

Notes: The peak month factors used in the above table is 1.25

Not all the WWTWs were in a good condition and all the treatment processes were not fully operational during the WSDP site visits. The items to be addressed at the WWTWs, as identified through the WSDP inspection process during March and April 2025, are as follows:

The Bot River WWTW:

- Security is compromised due to:
  - CCTV cameras and cables were vandalized.
  - Alarms in some of the buildings and the container, but not in the office.
  - The plant is not adequately fenced on all the sides. No fence at the N2 side. New fencing and gate at the entrance is only to prevent vehicle access.
- The spindle of one of the sluice gates at the inlet works was vandalized.
- Both the actual flow pumps are not working.
- The Secondary Settling Tank is not operational and full of sludge. The scraper broke off.
- The supernatant PS sump is not operational, cables were stolen.
- The pipes for Sodium Hypochlorite dosing and the tank were vandalized.

The Caledon WWTW:

- Security is compromised due to the plant not being fenced.
- Operational sampling equipment not adequate. HACH pH meter: Buffer solutions not regularly provided. The DR900 meter has not been working for the last three years.
- Raw Sewage PS: Pump No.2 is currently not operational.
- Diesel is not always available for the backup generator.
- Vegetation growing in the paved roads needs to be removed and site maintenance to be improved.
- The chlorine chip disinfection unit was empty during inspection.
- Maturation Ponds: Vegetation on the embankments and reeds in some of the ponds need to be cleared.
- Sludge drying beds: Vegetation to be removed from drying beds and the drying beds need to be refurbished.
- The belt press has not been working for the last eight years and was also vandalized.

The Genadendal WWTW:

- Grit channels: The sluice gates were stolen.
- The fence was vandalized and stolen.
- Four rotating brush aerators are currently not operational.
- The chlorine gas disinfection system is not in use as some components were vandalised.
- The final flow meter at Maturation Pond No. 3 was stolen.
- The E&H Prosonic flow meter for inflow is not operational, because the probe at inlet works was stolen.

The Greyton WWTW:

- Aerobic zone with three Aerators: One aerator is not operational, because of loose cable under the concrete slab.

The Grabouw WWTW:

- No CCTV at the entrance to the WWTW and only an alarm for the composting building.
- Both mechanical drum screens were not working.
- Stainless Steel Grit Classifier: No skips for the removal of grit.

- Bioreactor: Anoxic zone with two mixers: One mixer not working for the last seven months.
- The Recycle PS is not working, because the belt needs to be replaced.
- SST No.1: Not operational and the wheel/motor of the rotating bridge is faulty.
- SST No.2: The pump on the bridge is not working and a hand sludge pump is used for desludge. The main sump is blocked.
- SST No.1-3 Sump PS: Only one pump is working.
- SST No.4: Not operational. The motor is not working and the switch at the MCC is faulty.
- The belt press was vandalised and is not in use anymore.
- The composting tank is not operational for the last 4 to 5 years and the cables were vandalised.
- There is no emergency shower at the chlorine building.
- There is no BA set inside the cupboard at the WWTW. The ceiling of the chlorine building needs to be repaired.
- Three maturation ponds need to be desludged.
- Flow from the maturation ponds bypass the chlorine contact channel.

The Riviersonderend WWTW:

- The fence around the inlet chamber was stolen.
- Anaerobic Pond No.1: The embankments are overgrown with vegetation
- Anaerobic Pond No.2. The pond is full of sludge.
- Informal stockpiling of sludge is evident.
- Anaerobic Pond No.4: The embankments are overgrown with vegetation and grass in the pond to be removed.
- The embankments of the primary aerobic ponds are overgrown with vegetation and grass in the ponds needs to be removed.
- Secondary Aerobic Pond No.2: The embankments are overgrown with vegetation and reeds in the pond needs to be removed.

The Tesselaarsdal WWTW:

- The Ultraviolet Disinfection unit is not operational.

The Villiersdorp WWTW:

- Vegetation to be removed from one grit channel at inlet works.
- Reactor: R-Recycle Pumps.: Currently not operational, both pumps trip when switched on.
- Reactor: The probes of the DO Meters were broken off.
- Reactor: A-Recycle Pumps: Only one of the three pumps are operational.
- The maturation river is full of sludge and currently being bypassed.
- One wall of the maturation river has collapsed in 2023.
- The maturation river and chlorine contact channel are being bypassed, because of collapsed wall.
- The chlorine contact channel is currently not in use, because of the collapsed wall in the maturation river, there is sludge in the maturation river and the chlorine system needs to be serviced.
- The chlorine dosing system needs to be serviced, because of a gas leak.
- The water pump is leaking (Potable water), but water cannot be turned off, because of supply to other parts of plant.
- Filtration PS: Both pumps are not working and are currently being serviced.

- The Scada system is currently not operational.

Theewaterskloof Municipality evaluates the capacity and suitability of their WWTWs to meet the final effluent quality limits on an annual basis. When the water quality requirements for the final effluent becomes stricter and / or when the inflow to the WWTW has increased to such an extent that the capacity of the plant needs to be increased, the Municipality appoints reputed consulting engineering firms to undertake feasibility studies to perform technical and economical evaluation of the different options available for upgrading or extending the capacity of the treatment works.

The **Bot River WWTW** capacity was upgraded in 2009 from 0.35 Ml/day to 1.05 Ml/day and the current capacity is adequate to meet the long term future treatment requirements (More than ten years). The plant only needs to be upgraded after 2039 with an additional 0.5 Ml/d treatment capacity.

The **Caledon WWTW** was upgraded during the 2020/2021 and 2021/2022 financial years and the current hydraulic design capacity is 4.000 Ml/d and the organic design capacity is 5 433 kg COD/d. The current capacity is adequate for the short term (Next five years), but the plant will need to be upgraded after 2029 with an additional 1.7 Ml/d treatment capacity and again after 2039 with a further 1.0 Ml/d treatment capacity.

The **Genadendal WWTW** was upgraded during 2007 and the current hydraulic design capacity of the WWTW is adequate to meet the short to medium term future treatment requirements (Next eight years). The plant will need to be upgraded after 2033 with an additional 0.200 Ml/d treatment capacity.

The new **Greyton WWTW** was recently put into operation. The hydraulic design capacity is 0.500 Ml/d and the organic design capacity is 635 kg COD/d. The current capacity is adequate to meet the long term future treatment requirements (More than ten years). The plant only needs to be upgraded after 2036 with an additional 0.300 Ml/d.

The **Grabouw WWTW** was upgraded from 3.6 Ml/day to 8.5 Ml/day during 2012 to 2015. The current capacity is adequate for the short term (Next five years), but the plant will need to be upgraded after 2030 with an additional 4.0 Ml/d treatment capacity and again after 2040 with a further 5.5 Ml/d treatment capacity.

The **Riviersonderend WWTW** consists of an oxidation pond system and has an estimated capacity of 0.7 Ml/day. The pond system allows for long retention times which produce effluent of high standard which is used for irrigating of the neighbouring golf course. The WWTW is operating over its hydraulic design capacity and will need to be upgraded. The plant currently needs to be upgraded with an additional 0.7 Ml/d treatment capacity and again after 2038 with a further 0.5 Ml/d treatment capacity.

The **Tesselaarsdal** WWTW consists of a package plant. The low cost housing development was provided with a full waterborne sanitation system connected to the package plant. The other households currently make use of either conservancy tanks or septic tanks. The current location of the Tesselaarsdal package plant is inside a residential area and a new package plant needs to be constructed outside the residential area. The current plant needs to be decommissioned. The hydraulic design capacity of the new package plant also needs to be adequate to meet the future treatment requirements of Tesselaarsdal.

The capacity of the **Villiersdorp WWTW** was upgraded over the period 2013 to 2015 to a hydraulic design capacity of 2.5 Ml/day in order to comply with the special effluent quality standards as required by the DWS and to meet future treatment requirements. The current capacity is adequate for the short term future treatment requirements (Next five years). The plant needs to be upgraded after 2030 with an additional 1.0 Ml/d treatment capacity and again after 2040 with a further 1.5 Ml/d treatment capacity.

The WWTWs to be upgraded in Theewaterskloof Municipality are summarised in the table below.

Table C.3.16: WWTWs to be upgraded in the future

WWTW	Short, Medium, Long Term	Estimated Cost (Vat Excluded)
Refurbishment to be done at almost all the WWTW	2025	R20 000 000
Bot River Upgrade and Refurbishment of WWTW (Budget item)	2025	R35 247 179
Improved security fencing at some of the WWTWs	2025	R5 000 000
Riviersonderend Upgrade of WWTW (Budget item)(First Phase), additional 0.7 Ml/d.	2025	R13 481 095
Caledon Upgrade of WWTW (First Phase), additional 1.7 Ml/d	2029	R51 000 000

Table C.3.16: WWTWs to be upgraded in the future		
WWTW	**Short, Medium, Long Term**	**Estimated Cost (Vat Excluded)**
Grabouw Upgrade of WWTW (First Phase), additional 4.0 Ml/d	2030	R120 000 000
Villiersdorp Upgrade of WWTW (First Phase), additional 1.0 Ml/d	2030	R30 000 000
Genadendal Upgrade of WWTW, additional 0.2 Ml/d	2033	R6 000 000
Greyton Upgrade of WWTW, additional 0.3 Ml/d	2036	R9 000 000
Riviersonderend Upgrade of WWTW (Second Phase), additional 0.5 Ml/d	2038	R15 000 000
Caledon Upgrade of WWTW (Second Phase), additional 1.0 Ml/d	2039	R30 000 000
Bot River Upgrade of WWTW, additional 0.5 Ml/d	2039	R15 000 000
Grabouw Upgrade of WWTW (Second Phase), additional 5.5 Ml/d	2040	R165 000 000
Villiersdorp Upgrade of WWTW (First Phase), additional 1.0 Ml/d	2040	R45 000 000
Total		**R559 728 274**

Water Schemes: Based on the most likely land-use development scenario, the following future water reticulation infrastructure components will be necessary.

Table C.3.17: Future water reticulation infrastructure required
Bot River
Proposed distribution zones The changes to the existing distribution zones are the following: • The boundaries of the existing zones are increased to accommodate future development areas. • The zone boundary between the Bot River Lower reservoir zone and the Bot River Lower PRV zone is slightly adjusted in order to improve network conveyance and redundancy in the network. • A new Bot River Upper reservoir zone is proposed to accommodate future development areas B5 & B6 north of the N2 National Road and the higher lying areas within future development areas B14 & B23 south of the N2 National Road.
Proposed future system and required works The existing Bot River water distribution system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas. • A few distribution pipelines are required to reinforce water supply within the Bot River distribution network. • A few new distribution pipelines are proposed to supply future development areas with water when they develop.
Caledon
Proposed distribution zones The changes to the existing distribution zones are the following: • The boundaries of the existing zones are increased to accommodate future development areas. • The zone boundary between the Lower 4 Ml reservoir zone and the Badskop reservoir zone is slightly adjusted in order to improve network conveyance and redundancy in the network. • A new Southern PRV 1 zone is proposed to accommodate the lower lying erven in Bergsig that is currently accommodated within the Natuurtuin reservoir zone. This zone should initially be supplied with water from the Badskop reservoirs through the Badskop reservoir zone reticulation network. When the proposed Southern reservoir is constructed this zone should be supplied with water from the new reservoir (through the proposed Southern reservoir zone's reticulation network). • A new Southern PRV 2 zone is proposed to accommodate the existing developments in the Uitsig and Riemvasmaak suburbs. Riemvasmaak is currently accommodated within the Natuurtuin reservoir zone and Uitsig within the Lower 4 Ml reservoir zone. This zone should initially be supplied with water from the Lower 4 Ml reservoir through the existing reticulation network. When the proposed Southern reservoir is constructed this zone should be supplied with water from the new reservoir through new supply pipelines between the reservoir and Uitsig and a new PRV in Chavonnes Street. • A new Caledon Southern reservoir zone is proposed to accommodate future development areas C11, C13, C20 & C21 to the south of Caledon. When the new Southern reservoir is constructed it is proposed that the lower lying erven in the existing Badskop reservoir zone (in Bergsig) are also accommodated within this new zone. • A new Bergsig booster zone (supplied from the proposed Caledon Southern reservoir) is proposed to accommodate the higher lying development areas C18 & C19 in Bergsig. • A new Blue Crane reservoir zone is proposed to accommodate future development areas C7.2 & C7.3 between Caledon and Myddleton.
Proposed distribution zones The existing Caledon water distribution system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas. • A few distribution pipelines are required to reinforce water supply within the Caledon distribution network. • A few new distribution pipelines are proposed to supply future development areas with water when they develop.

Table C.3.17: Future water reticulation infrastructure required

Greater Genadendal

Proposed distribution zones

The changes to the existing distribution zones are the following:

- A new Bereaville booster zone is proposed in Bereaville to improve low water pressures that are experienced at the higher lying erven.
- A new Voorstekraal booster zone is proposed in Voorstekraal to improve low water pressures that are experienced at the higher lying erven.
- The boundaries of the existing Genadendal and Voorstekraal reservoir zones are increased to accommodate future development areas.

Proposed future system and required works

The existing Genadendal, Bereaville and Voorstekraal water distribution system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas.

- A few distribution pipelines are required to reinforce water supply within the Genadendal, Bereaville and Voorstekraal distribution networks.
- New distribution pipelines are proposed in Genadendal and Voorstekraal to supply future development areas with water when they develop.

Grabouw

Proposed distribution zones

The changes to the existing distribution zones are the following:

- The boundaries of the existing zones are increased to accommodate future development areas.
- The existing Steenbras PRV 1 & 3 zones are incorporated within the existing Steenbras Lower reservoir zone. These zones were previously created through the implementation of PRVs on the existing 250 mm Ø AC pipeline between the Steenbras PS (located at the Grabouw WTP) and the Steenbras reservoir to protect the existing Steenbras reservoir reticulation network from water hammer when the pumps switches on or off (the existing 250 mm Ø AC pipeline was a combined feeder main from the PS and supply pipeline from the reservoir). After the implementation of the dedicated 315 mm Ø uPVC pipeline between the Steenbras PS and reservoir the 250 mm Ø AC pipeline has been transferred to the network and the PRVs on the pipeline have become redundant.
- A new Steenbras Upper reservoir is proposed to supply water to the existing Steenbras High Level PRV zone (that is currently supplied from the higher lying Steenbras High Level reservoir). This so called “Steenbras Upper” reservoir zone should accommodate future development areas G14 & G15.1 in future.
- The zone boundary between the Steenbras Lower reservoir zone (north eastern area that was previously in the Steenbras PRV 1 zone) and the Steenbras Upper reservoir zone (previous Steenbras High Level PRV zone) is adjusted in order to improve static and residual pressure in the network.
- The existing Steenbras PRV 2 zone (that is currently supplied from the Steenbras Lower reservoir) is supplied in the master plan model from the proposed Steenbras Upper reservoir. A portion of the existing Uitkyk PRV zone is also accommodated within this so-called “Steenbras Upper PRV” zone.
- The southern portion of the existing Uitkyk PRV zone is accommodated within the existing Uitkyk reservoir zone.
- The Collin’s Kop booster zone is accommodated within the larger Steenbras Lower reservoir zone.
- A new Collin’s Kop reservoir zone is established (supplied from the existing Collin’s Kop reservoir) to accommodate future development areas G22.2, G34 & G35 on the eastern side of Grabouw.
- A new Steenbras High Level reservoir zone (supplied from the existing Steenbras High Level reservoir) is created to accommodate future development areas G1 & G2.
- A new Steenbras High Level PRV zone is proposed to accommodate future development areas G6, G13 & the higher lying areas within future area G3 (areas that cannot be accommodated within the new Steenbras Upper reservoir zone).

Proposed future system and required works

The existing Grabouw water distribution system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas.

- A few distribution pipelines are required to reinforce water supply within the Grabouw distribution network.
- New distribution pipelines are proposed to supply future development areas with water when they develop.

Greyton

Proposed distribution zones

The changes to the existing distribution zones are the following:

- The Greyton Upper reservoir zone replaces the existing Greyton booster zone (the existing zone is supplied from a new higher lying reservoir as opposed as from the existing lower lying reservoir through the booster PS).
- The boundaries of the existing zones are increased to accommodate future development areas.

Proposed future system and required works

The existing Greyton water distribution system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas.

Table C.3.17: Future water reticulation infrastructure required
• A few distribution pipelines are required to reinforce water supply within the Greyton and Boschmanskloof distribution networks. • New distribution pipelines are proposed to supply future development areas with water when they develop.
Riviersonderend
Proposed distribution zones The boundaries of the existing distribution zones are increased to accommodate future development areas.
Proposed future system and required works The existing Riviersonderend water distribution system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas. • A few distribution pipelines are required to reinforce water supply within the Riviersonderend distribution network. • New distribution pipelines are proposed to supply future development areas with water when they develop.
Tesselaarsdal
Proposed distribution zones The boundaries of the existing distribution zones are increased to accommodate future development areas
Proposed future system and required works The existing Tesselaarsdal water distribution system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas. • A few distribution pipelines are required to reinforce water supply within the Tesselaarsdal distribution network. • New distribution pipelines are proposed to supply future development areas with water when they develop.
Villiersdorp
Proposed distribution zones The changes to the existing distribution zones are the following: • The boundaries of the existing zones are increased to accommodate future development areas. • A new Very High reservoir zone is proposed in order to accommodate the higher lying developments to the North West of Villiersdorp (future development areas V1.2, V1.7, V10.2, V10.3, V10.4 & V2). It is proposed that the existing High Level reservoir and 19 Damme booster zones are incorporated within this new zone. • The zone boundary between the Ham Street reservoir zone and the 19 Damme reservoir zone is adjusted in order to improve network conveyance and static and residual pressure in the existing network. • A new North East reservoir zone is proposed in order to accommodate the higher lying developments to the North East of Villiersdorp (future development areas V6, V7 & V8).
Proposed future system and required works The existing Villiersdorp water distribution system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas. • A few distribution pipelines are required to reinforce water supply within the Villiersdorp distribution network and to supply water to future development areas when they develop.

Sanitation Schemes: Based on the most likely land-use development scenario, the following further sewer reticulation infrastructure components will be necessary.

Table C.3.18: Future sewer reticulation infrastructure required
Bot River
• The boundaries of the existing drainage areas in Bot River are increased to accommodate proposed future development areas that fall within these drainage areas. • New outfall sewers are proposed to service the existing erven in Bot River that are currently not serviced with a full water borne sanitation system (within the Bot River Gravity and Bot River PS drainage areas). • New Future PS B1 & B2 drainage areas are proposed to accommodate future development areas B18 & B20 to B25 south of the N2 National Road. New pump stations and rising mains should be constructed for these drainage areas. Future PS B2 should discharges into the drainage area of the proposed Future PS B1, and Future PS B1 should discharges into a new bulk sewer that gravitates towards the existing Bot River WWTP. • A number of existing outfall sewers require upgrading by replacement with larger sized future sewers and a number of new outfall sewers are proposed to accommodate future development areas that fall within the drainage areas of the Bot River WWTP.
Caledon
• The boundaries of the existing drainage areas in Caledon are increased to accommodate proposed future development areas that fall within these drainage areas. • A new Future PS C1 drainage area is proposed to accommodate future development area C21 to the south of Caledon. A new pump station and rising mains should be constructed for this drainage areas that discharges into the existing Caledon Gravity drainage area. • New outfall sewers are proposed to service the existing erven in Caledon without a formal water borne sanitation system (within the Caledon Gravity drainage area).

Table C.3.18: Future sewer reticulation infrastructure required
• It is proposed that the existing bulk sewer from Uitsig to the Caledon WWTP is upgraded in order to accommodate future development areas in Caledon and Myddleton. • A number of existing outfall sewers require upgrading by replacement with larger sized future sewers and a number of new outfall sewers are proposed to accommodate future development areas that fall within the drainage areas of the Caledon WWTP.
Greater Genadendal
• The boundaries of the existing drainage areas in Genadendal and Voorstekraal are increased to accommodate proposed future development areas that fall within these drainage areas. • New outfall sewers are proposed to service erven in Genadendal, Bereaville and Voorstekraal that are currently not serviced with a full water borne sanitation system. • A new outfall sewer is proposed between Bereaville and Voorstekraal in order to accommodate sewage from Bereaville. • A few existing outfall sewers require upgrading by replacement with larger sized future sewers. • New outfall sewers are proposed to accommodate future development areas that fall within the drainage areas of the Genadendal WWTP. • It is proposed that when the West PS or Main PS in Genadendal reaches capacity a new bulk pump station is constructed at the existing West PS site with a new rising main that discharges directly to the existing Genadendal WWTP. Sewage flow from the existing West PS and Main PS drainage areas can then be diverted to the new Main PS (Future bulk PS GG1) and the existing West PS and Main PS should be decommissioned.
Grabouw
• The boundaries of the existing drainage areas in Grabouw are increased to accommodate proposed future development areas that fall within these drainage areas. • A new Future PS G1 drainage area is proposed to accommodate future development area G34 to the east of Grabouw. A new pump station and rising mains should be constructed for this drainage area that discharges directly to the existing Grabouw WWTP. • One of the major upgrades proposed to the Grabouw sewer system is the construction of a new bulk sewer from the Pineview PS to the existing Palmiet PS. Sewage flow from the Pineview PS and Molteno PS drainage areas can then be diverted to this new bulk sewer and the existing Pineview and Molteno pump stations can be decommissioned. It is proposed that when the existing Palmiet PS reaches capacity it is replaced with a new bulk PS and a new dedicated rising main to the Grabouw WWTP. • A number of existing outfall sewers require upgrading by replacement with larger sized future sewers and a number of new outfall sewers are proposed to accommodate future development areas that fall within the drainage areas of the Grabouw WWTP.
Greyton
• The boundary of the existing Greyton gravity drainage area in Greyton and Boschmanskloof is increased to accommodate proposed future development areas that fall within the drainage area. • New outfall sewers are proposed to service erven in Greyton and Boschmanskloof that are currently not serviced with a full water borne sanitation system (within the Greyton Gravity drainage area). • A few existing outfall sewers require upgrading by replacement with larger sized future sewers. • New outfall sewers are proposed to accommodate future development areas that fall within the Greyton Gravity drainage area.
Riviersonderend
• The boundaries of the existing drainage areas in Riviersonderend are increased to accommodate proposed future development areas that fall within these drainage areas. • A number of existing outfall sewers require upgrading by replacement with larger sized future sewers. • New outfall sewers are proposed to accommodate future development areas that fall within the drainage areas of the Riviersonderend WWTP. • It is proposed that the existing Riviersonderend pump stations 3 & 4 are decommissioned and replaced with a new bulk PS (Future bulk PS R1), located just north of the existing PS 3. New bulk sewers will be required to divert sewage flows from the existing PS 3 and PS 4 drainage areas to the proposed Future bulk PS R1.
Tesselaarsdal
• The boundary of the existing Tesselaarsdal drainage area is increased to accommodate proposed future development areas. • New outfall sewers are proposed to accommodate future development areas that fall within the Tesselaarsdal drainage area and to service erven in Tesselaarsdal that are currently not serviced with a full water borne sanitation system.
Villiersdorp
• The boundaries of the existing drainage areas in Villiersdorp are increased to accommodate proposed future development areas that fall within these drainage areas. • A new Destiny Farm PS drainage area is proposed to accommodate future development areas V1.1 to V1.11 on Destiny Farm to the west of Villiersdorp. A new pump station and rising main should be constructed for this drainage area that discharges directly into the existing Villiersdorp Gravity drainage area. • A new Future PS V2 drainage area is proposed to accommodate future development areas V3 & V4 to the south of Villiersdorp. A new pump station and rising main should be constructed for this drainage area that discharges directly to the existing Villiersdorp WWTP. • A number of existing outfall sewers require upgrading by replacement with larger sized future sewers and a number of new outfall sewers are proposed to accommodate future development areas that fall within the drainage areas of the Villiersdorp WWTP.

TOPIC 4: WATER SERVICES OPERATION AND MAINTENANCE

Table C.4.1: Water Services O&M

Section	Intervention Required?	% (1)	Solution description as defined by topic situation assessment	% (2)	Is there an Existing project / activity addressing this problem?	Current Demand Overall Scoring % (3)
O&M Plan Is There an O&M Plan?	Yes	100.0	Operation and Maintenance tasks for the various water and sewerage infrastructure components, as indicated under Sections 4.1.1 to 4.1.10 should be implemented. Ensure the required O&M schedules are in place and signed off.	100.0	Partially	78.6
Resources	Yes	100.0	A budget of approximately 2% of the total asset value per annum should be allocated towards the replacement of existing water and sewerage infrastructure (Best Practice). In the case of operations and maintenance of the system, a budget of approximately 1% to 2% of the value of the system is typically required to ensure that the system remains in good condition (Best Practice).	100.0	Partially	85.7
	No	100.0	Theewaterskloof Municipality needs to ensure that the number of process controllers at each of the WTWs and WWTWs and the class of process controller complies with the required number of process controllers and class of process controller per plant (New Regulation 3630).	100.0	Partially	78.6
Information	No	100.0	All incidents at the WTWs and WWTWs and on the water reticulation networks and sewer drainage networks need to be recorded and Incident Management Protocols, as included in the Water Safety Plans and W_2RAPs, need to be followed after an incident.	100.0	Yes	85.7
	No	100.0	Ensure that the required O&M Manuals are in place for all the water and sewerage infrastructure.	100.0	Partially	78.6
Activity Control & Management	Yes	100.0	Groundwater: Implement recommended daily, weekly, monthly and six monthly O&M activities for the boreholes.	100.0	Partially	85.7
			Surface water infrastructure: Implement preventative maintenance procedures.	100.0	Partially	85.7
			Bulk and water reticulation networks and fittings: Compile daily, weekly, monthly and annual maintenance checklists for the maintenance activities for the water reticulation networks and fittings.	100.0	Partially	85.7
			WTWs: Evaluate the existing O&M schedules for the WTWs against the recommended O&M tasks and ensure all required activities are adequately monitored and recorded.	100.0	Partially	85.7
			Water PSs: Compile weekly and monthly maintenance checklists for the recommended activities for all the water PSs and all PSs need to be inspected on at least a weekly basis.	100.0	Partially	85.7
			Reservoirs: Compile maintenance checklists for the recommended reservoir maintenance activities and document all inspections.	100.0	Partially	85.7
			Remote monitoring and Control Systems: Ensure adequate maintenance is carried out on the SCADA systems and compile maintenance checklists for the recommended activities.	100.0	Partially	85.7
			Sewer PSs: Compile weekly and quarterly maintenance checklists for the recommended activities for all the sewer PSs and all centrifugal pump stations need to be inspected on at least a weekly basis.	100.0	Partially	85.7
			Bulk and sewer drainage networks: Annual, monthly and weekly schedules for maintenance should be drawn up for the bulk and sewerage networks. Regular cleaning of sewer lines and all blockages and their precise locations should be recorded.	100.0	Partially	85.7
			WWTWs: Evaluate the existing O&M schedules for the WWTWs against the recommended O&M tasks and ensure all required activities are adequately monitored and recorded.	100.0	Partially	85.7

Notes: (1) Is this section addressed in the WSDP?
(2) Were solutions identified for the possible gaps?
(3) Percentage calculated based on the above two percentages and whether there is an existing project/activity addressing this problem? Does this current listed project/activity address the problem totally? Project/Activity approved by Council as part of WSDP database? Approved by Council in project activity database and part of 5yr IDP cycle projects? Project/Activity listed in 3yr MTEF Cycle?

It is important for Councils to understand the value of maintenance and provide the necessary funding to properly operate and maintain infrastructure. It is the responsibility of the municipal and technical managers to educate and inform Councils on this and help councillors explain these issues to their communities. **Successful municipalities depend to a single principle – effective and efficient management!**

Much of the routine work of technical departments involves managing and undertaking the O&M of services that is done in-house by municipal staff. A second major aspect of work is managing O&M undertaken by external service providers. The third major area is new or capital projects, also usually undertaken by external service providers.

Each service area in Theewaterskloof Municipality needs an O&M system that monitors and assesses infrastructure condition and plans the required preventative maintenance, and when necessary, rehabilitation, upgrading or replacement of infrastructure. This is a major part of an overall Asset Management System, which

- records, describes all infrastructure assets;
- monitors and assesses their condition;
- plans and monitors maintenance;
- plans upgrading, rehabilitation and replacement; and
- values assets and the costs of maintenance, upgrading, rehabilitation and replacement.

There are a wide range of **desirable objectives** that should be achieved with the help of maintenance.

- Retain an asset in a serviceable condition during its designed life span.
- Optimize the reliability of equipment and infrastructure.
- Ensure that the equipment and infrastructure are kept in a good condition.
- Ensure prompt emergency repair of equipment and infrastructure to sustain service delivery.
- Take action before repair costs become too high.
- Ensure operation by eliminating breakdown risks or limiting them as much as possible.
- Improve delivery by upgrading infrastructure.
- Enable repairs under the best possible conditions.
- Improve operational safety and remove causes of accidents.
- Reduce the overall management burden through better work preparation and reduced unforeseen production stoppages.
- Protect the environment.

To achieve these objectives, it is necessary to train personnel in specific maintenance skills and to influence their attitudes, as better operational results depend on motivated staff who are committed to proper maintenance procedures and standards.

Setting up a preventative maintenance programme is one of the most effective ways of reducing breakdowns and keeping equipment and infrastructure in good condition. It is important to implement such a programme as soon as new equipment or infrastructure is put into service.

Implementing a preventative maintenance programme requires a **maintenance plan**, with particular emphasis placed on the following:

- Periodic inspection of equipment according to a pre-established programme so that working conditions may be checked.
- Systematic servicing – the first step in devising this programme is to forecast the life of parts and components subject to wear, i.e. the study of reliability, failure modes and effects and fault analysis.
- Overhauls, which often require considerable work, should be planned during low production periods.

The complexity of maintenance activities should be analysed to set up an efficient maintenance plan and to take management decisions, e.g. regarding use of own resources and unskilled or skilled resources. **Five levels of maintenance** can be distinguished, depending on the complexity of the work and the urgency of action.

- Simple adjustments are generally applicable to accessible components and require no dismantling or opening of the equipment. These adjustments involve the completely safe replacement of accessible consumable components such as signal lights or some types of fuses. Servicing of this type may be performed by the operator on site, without tools, following the instructions for use. The stock of consumable parts required is very small.

- Troubleshooting entails minor preventative maintenance operations such as greasing or checking for proper functioning. Servicing of this type may be performed on site by an authorised technician. An authorised technician has received training that enables him/her to perform such maintenance work safely and is well aware of potential problems.

- Breakdowns require identification, diagnosis and repairs by replacing components or working parts. Servicing of this type must be carried out by trained persons, on site or in the maintenance shop, using the documentation (manuals, spare part lists, etc.) necessary for maintenance of equipment.

- Major maintenance work covers all major corrective or preventative work except modernization and rebuilding. Servicing of this type must be carried out by a team that comprises highly skilled technical specialists, using the relevant documentation.

- Modernising and rebuilding equipment or executing major repairs is usually done by the manufacturer or builder. Resources are specified and usually very similar to those used in the original manufacturing or construction.

In order to ensure **good quality O&M**, technical managers firstly need to ensure that staff responsible for in-house O&M

- understand equipment and infrastructure;
- understand and implement the proper O&M requirements and procedures;
- understand the required service and operating standards;
- have and develop the necessary O&M skills;
- assess equipment and infrastructure conditions;
- understand and identify typical defects and problems;
- solve problems and make necessary repairs, or engage experts to do so; and
- record all activities to provide data for planning and analysis of O&M.

Secondly technical managers must ensure that they contact competent external service providers.

The bulk of O&M activities should be of a preventative nature. That is regular checking all the water and sewerage infrastructure and ensuring that everything is in good operational condition. Sections 4.1.1 to 4.1.10 of the “Future Demand and Functionality Requirements” Water Services Master Plan include recommended O&M tasks for the various water and sewerage infrastructure components that should be implemented by Theewaterskloof Municipality.

A budget of approximately 2% of the total asset value per annum should be allocated towards the replacement of existing infrastructure. In the case of the operations and maintenance of the systems, a budget of approximately 1% to 2% of the value of the system is typically required to ensure that the systems remain in good condition (Best Practice).

The table below gives an overview of the OC and CV of the water and sewerage infrastructure included in Theewaterskloof Municipality's Asset Register (June 2024). The recommended budgets for the refurbishment / replacement of the existing infrastructure and the O&M of the existing infrastructure, based on the CRC of the water and sewerage infrastructure in the WSDP, are also indicated.

Table C.4.2: Recommended budgets for the refurbishment / replacement and the O&M of the existing water and sewerage infrastructure.

Asset Type	Asset Register June 2024		WSDP CRC	Required Annual Replacement Budget (Best Practice)	Required Annual O&M Budget (Best Practice)	Depreciation and Asset Impairment Actual Expenditure
	Opening Cost	Carrying Value		2.00%	1.50%	2023/2024
Boreholes	R5 830 480	R3 709 926	R14 950 000	R299 000	R224 250	R7 751 820
Bulk Water Pipeline	R24 209 969	R23 816 479	R644 370 000	R12 887 400	R9 665 550	
Reticulation Pipeline	R87 304 311	R68 227 034				
Reservoirs	R38 644 488	R30 173 682	R174 685 000	R3 493 700	R2 620 275	
Pump Stations	R27 704 653	R18 241 691	R60 871 000	R1 217 420	R913 065	
Grabouw WTW	R18 201 919	R14 122 829	R33 750 000	R675 000	R506 250	
Bot River WTW	R4 406 665	R4 406 353	R12 000 000	R240 000	R180 000	
Caledon WTW	R9 273 172	R5 895 499	R33 000 000	R660 000	R495 000	
Bereaville WTW	R2 144 816	R1 314 366	R5 250 000	R105 000	R78 750	
Voorstekraal WTW	-	-	R5 250 000	R105 000	R78 750	
Greyton WTW	R1 999 763	R1 084 318	R13 480 000	R269 600	R202 200	
Genadendal WTW	R3 528 256	R2 510 836	R6 000 000	R120 000	R90 000	
Villiersdorp WTW	R5 799 929	R4 864 323	R58 000 000	R1 160 000	R870 000	
Riviersonderend WTW	R186 586	R56 467	R48 000 000	R960 000	R720 000	
Dams & Weirs	R3 853 987	R1 650 312	R2 800 000	R56 000	R42 000	
Consumer Connections	R32 539 711	R18 334 621	Incl. under Retic.	Incl. under Retic.	Incl. under Retic.	
Sub Total Water	**R265 628 705**	**R198 408 736**	**R1 112 406 001**	**R22 248 120**	**R16 686 090**	**R7 751 820**
Sewer Ret.Pipelines	R146 003 306	R124 998 782	R623 490 000	R12 469 800	R9 352 350	R9 597 304
Sewer Pump Stations	R7 176 148	R5 529 031	R33 540 000	R670 800	R503 100	
Genadendal WWTW	R6 915 454	R5 285 155	R18 000 000	R360 000	R270 000	
Greyton WWTW	R26 763 695	R25 582 214	R15 000 000	R300 000	R225 000	
Caledon WWTW	R66 858 222	R61 470 380	R100 000 000	R2 000 000	R1 500 000	
Botrivier WWTW	R7 245 975	R5 351 211	R26 275 000	R525 500	R394 125	
Riviersonderend WWTW	R755 852	R557 653	R10 500 000	R210 000	R157 500	
Villiersdorp WWTW	R27 644 646	R21 824 693	R62 500 000	R1 250 000	R937 500	
Grabouw WWTW	R55 602 349	R32 482 534	R212 500 000	R4 250 000	R3 187 500	
Tesselaarsdal WWTW	R798 004	R262 282	R2 500 000	R50 000	R37 500	
Total Sewerage	**R345 763 651**	**R283 343 935**	**R1 104 305 000**	**R22 086 100**	**R16 564 575**	**R 9 597 304**
Total Water and Sewerage	**R611 392 356**	**R481 752 671**	**R2 216 711 001**	**R44 334 220**	**R33 250 665**	**R17 349 124**

TOPIC 5: CONSERVATION AND DEMAND MANAGEMENT

Table C.5.1: Conservation and Demand Management - Water Resource Management

Section	Intervention Required?	% (1)	Solution description as defined by topic situation assessment	% (2)	Is there an Existing project/activity addressing this problem?	Current Demand Overall Scoring % (3)
Reducing unaccounted water and water inefficiencies	Yes	100.0	Implement the proposed WC/WDM Strategy and the 25 WC/WDM items. Ensure adequate budget is allocated under the Capital and Operational budgets towards the implementation of the WC/WDM initiatives.	100.0	Partially	85.7
	Yes	100.0	Set up meeting with the Large Water Users to discuss water consumption status, potential water saving volumes and to cultivate a water saving awareness within each large water user.	100.0	No	78.6

Table C.5.1: Conservation and Demand Management - Water Resource Management						
Section	**Intervention Required?**	**% (1)**	**Solution description as defined by topic situation assessment**	**% (2)**	**Is there an Existing project/activity addressing this problem?**	**Current Demand Overall Scoring % (3)**
Leak and meter repair programmes.	Yes	100.0	Implement a Leak Repair and Assistance Programme that investigates and repairs leaks at all domestic households in low cost housing developments and poor areas with consumption above 15 kl/month. An exercise could also be initiated to check for visual leakage at public buildings, using more than 60 kl/month.	100.0	No	71.4
	Yes	100.0	Continue with the implementation of the pipeline replacement programme. The location of pipe failures should in the future be recorded preferably with accurate GPS coordinates. This improves the integrity of the output of the pipe failure model. If a longer and more comprehensive pipe failure record could be established, the integrity of the output could be further enhanced. Pipes with the highest PRP values should be considered to be replaced first.	100.0	Partially	92.9
	No	100.0.	Install water meters at all the unmetered erven and inspect metered erven with zero consumption.	100.0	Partially	85.7
Consumer/end-use demand management: Public Information & Education Programmes	Yes	100.0	At least once a year, a schools education programme on water conservation should be undertaken. The Municipality should assist the school(s) with the monitoring (water audit) of their water consumption. Theewaterskloof Municipality can also focus on the implementation of an extensive schools WDM programme, which can include annual competitions between schools (Say with a prize for the lowest consumption, the lowest per capita consumption and for the best WDM Strategy poster design, etc.). A schools WDM programme should receive a high priority.	100.0	No	71.4
	Yes	100.0	Continue to focus on the installation of water saving devices (specific water efficient toilets) and raising awareness regarding conservation projects and the installation of these products in order to reduce water demand. The use and installation of these fittings should be included as a condition for the approval of building plans as well as provided for in the Water Services By-law.	100.0	Partially	85.7
Conjunctive use of surface - and groundwater	No	100.0				100.0
Working for Water	No	100.0				100.0

Notes: (1) Is this section addressed in the WSDP?
(2) Were solutions identified for the possible gaps?
(3) Percentage calculated based on the above two percentages and whether there is an existing project/activity addressing this problem? Does this current listed project/activity address the problem totally? Project/Activity approved by Council as part of WSDP database? Approved by Council in project activity database and part of 5yr IDP cycle projects? Project/Activity listed in 3yr MTEF Cycle?

Table C.5.2: Conservation and Demand Management - Water Balance						
Section	**Intervention Required?**	**% (1)**	**Solution description as defined by topic situation assessment**	**% (2)**	**Is there an Existing project/activity addressing this problem?**	**Current Demand Overall Scoring % (3)**
Water Balance	Yes	100.0	Ensure that the volume of water supplied from all water resources are metered (each individual source separately), the raw water and final water at the WTWs and the volume of water supplied to the various zones (at Reservoirs). The inflow at the WWTWs, the volume of treated effluent re-used and the volume of treated effluent returned to the water resource system also need to be metered at all the WWTWs.	100.0	Partially	85.7

Notes: (1) Is this section addressed in the WSDP?
(2) Were solutions identified for the possible gaps?
(3) Percentage calculated based on the above two percentages and whether there is an existing project/activity addressing this problem? Does this current listed project/activity address the problem totally? Project/Activity approved by Council as part of WSDP database? Approved by Council in project activity database and part of 5yr IDP cycle projects? Project/Activity listed in 3yr MTEF Cycle?

The Revised Compulsory National Water and Sanitation Standards, as published in Government Gazette No.52814 of 6 June 2025, include the following WC/WDM requirements:

- Where spillages or leaks in its water supply network are detected or reported, a Water Services Institution must record such cases and ensure that they repair all leaks within 48 hours of becoming aware thereof.
- A Water Services Institution must isolate 95% of detected or reported water pipe bursts in its water supply system within a maximum of four (4) hours of becoming aware thereof.
- Where spillages or sewer blockages in its wastewater collection network are detected or reported, a Water Services Institution must record such cases and ensure that they are contained and must be repaired within 24 hours of becoming aware thereof. The affected surface area must be cleaned and or disinfected.
- A Water Services Institution must have a 24-hour consumer care facility supported by the system to which leaks, spillages or water service related enquiries and complaints can be reported and feedback be given to the consumer.
- Whenever emergency or alternative water supply is provided in terms of Regulation 4(1), the Water Services Institution must ensure that taking of water from a bulk line, if applicable, is appropriately metered and recorded (i.e. if alternative water is provided through tankering the number of tankers and their volume must be recorded when taking from a bulk metered pipeline).
- A Water Services Institution must implement a Pressure Management Programme allowing water reticulation systems to be operated at a minimum pressure of 20 m and maximum of 90 m.
- Where water pressure in a water reticulation system could rise above 90 m, a Water Services Institution must install a pressure control device to prevent the pressure at any domestic consumer connection from rising above 90m.
- A Water Services Institution must take steps to measure and progressively reduce losses, maintain the water use efficiency KPIs including the quantity of water losses, the quantity of NRW, ILI and per capita usage to within international accepted standards as follows:
  - NRW 20% – 30%;
  - Water Losses 10% - 20%;
  - Infrastructure Leakage Index 2 – 4; and
  - Per Capita Usage 120 l/c/d – 180 l/c/d
- Water Services Institutions must develop and implement a 10-year Council approved WC/WDM Strategy and an Annual Plan within 6 months of the publication to be uploaded on the IRIS system and must consist of at least the following:
  - Situation Assessment;
  - Key issues and challenges;
  - Focus areas of interventions;
  - List of proposed interventions;
  - Set targets for demand, NRW, water losses (commercial and real losses), ILI and per capita usage in line with subsection above; and
  - Budgets and Multi-year Implementation timelines.
- WSAs must require greenfield developments or major brownfield redevelopments, prior to planning approval, to indicate the manner and extent in which WC/WDM and water efficient sanitation solutions (WESS) has been accommodated and accounted for in their selected technology options, in terms of efficient water use and off-grid sanitation.

The 2013/2014 WC/WDM Strategy of Theewaterskloof Municipality is outdated and a new WC/WDM Strategy needs to be compiled for the Municipality.

DWS's Municipal Scorecard for assessing the potential for WC/WDM efforts in Municipalities was used to assess the potential for WC/WDM efforts in Theewaterskloof Municipality. The status quo score for Theewaterskloof Municipality is 69 out of 100 suggesting that the Municipality is making good progress with regard to the implementation of specific WC/WDM activities.

The proposed WSDP WC/WDM Strategy for Theewaterskloof Municipality is based on the 25 items included in the Scorecard and the section below discuss the Strategy and Budget Requirements for each of these items in detail.

Table C.5.3: Proposed WC/WDM Strategy items for Theewaterskloof Municipality

Item 1: Development of a Standard Water Balance

Recommendation and Strategy:

- Continue with the monthly updating of the IWA Water Balances for the eight systems and reporting on the NRW and Water Losses for each of the systems to management. Employ and train a dedicated senior technician to manage NRW analysis.
- Continue with the drafting of an annual WSDP Performance and Water Services Audit Report, as required by the Water Services Act and the 6 June 2025 Revised Compulsory National Water and Sanitation Standards, which include the water balances.
- Implement the recommended WC/WDM activities in order to reduce the NRW and Water Losses.
- Determine all unbilled authorized consumption by firstly identify all the relevant consumers, e.g. Municipal buildings, parks, fire services, sport fields, etc. Unbilled consumption do not generate income, but will enable the municipality to better quantify their NRW.

Funding and Budget Requirements:

The IWA Water Balances for the eight systems are updated on a monthly basis by the municipality.

Item 2: Pressurised System at all times

Recommendation and Strategy:

- Adequate human resources, technical skills and O&M budgets need to be allocated towards the operation, maintenance and refurbishment of the existing infrastructure, in order to ensure that systems are always pressurised.
- Existing water pump stations that are in a poor condition needs to be refurbished.
- Ensure proper maintenance of the existing PRVs in Grabouw, Bot River and Villiersdorp.
- The Water Master Plans to be consulted in conjunction with the WC/WDM priority projects to identify future areas where pressure reduction can be implemented.

Funding and Budget Requirements:

- Budgets as indicated under the individual items of the WC/WDM Strategy.
- Increase O&M budget allocations towards the refurbishment and replacement of old water infrastructure.
- A budget of R3 000 000 is required for the identification and implementation of future recommended PRV zones.

Items 3 and 4: Metering System

Recommendation and Strategy:

- All un-metered water connections, when identified through the proposed Swift process, need to be provided with water meters. Meters need to be read on a monthly basis and consumers need to be billed monthly according to their actual water usage. In addition to water theft, many water accounts go unnoticed in the system or have some type of data inconsistency that results in no revenue being generated for the particular water use event. The recommended SWIFT data, once available, needs to be used to clean the Treasury data and the municipality needs to identify and correct any inaccurate data in the system (Linkage of Treasury data with cadastral data).
- Consumer consumption checks / investigations need to be carried out where water usage are very low, but there are households on the property (Use Swift data). This project will give a clear indication of where illegal or unregistered connections is being made and whether the meter is under reading the actual consumption, thus water is being used but not billed or recorded.
- Use the Swift data, once available, to identify all unmetered erven and all meters with zero consumption. All illegible / broken / old meters should be replaced. Any un-metered stands should be metered and meter readings in the billing system should be updated where required. All meter boxes should also be cleaned as part of the inspections.
- Municipality needs to continue with the implementation of their Meter Management / Replacement program. An effective Meter Management / Replacement Program needs to achieve the following objectives:
  - Determine the on-going meter replacement programme;
  - Determine exception reports on meters which are suspected to be faulty;
  - Test and replace faulty meters; and
  - Size meters correctly.

  The activities of this program that needs to be budgeted for are as follows:
  - Research and development of a meter replacement policy and meter management / replacement programme;
  - Implementation of a uniform meter management information system;
  - Testing and replacing faulty meters reported by consumers (Part of reticulation function).
- Replacement of domestic meters with AMR enabled format (where appropriate) in accordance with meter management / replacement programme.

Funding and Budget Requirements:

Table C.5.3: Proposed WC/WDM Strategy items for Theewaterskloof Municipality

Allow a budget of approximately R200 000 for a SWIFT analysis at least once every three years to identify unmetered erven and erven with no or very low consumption. Estimated annual budget requirement for the installation of individual water meters is R1 000 000.

Item 5: Effective and Informative Billing System

Recommendation and Strategy:

- Municipality needs to continue to ensure that all customer's meters are read on a monthly basis and that the customers are billed on a monthly basis according to the actual volume of water used for the specific month.
- Municipality needs to continue with the commercial data analysis done on the billed metered consumption data, which include the identification of un-metered erven, investigating meters with zero consumption, investigating abnormal low and high consumption readings, oversized / undersized meters, etc.
- The Municipality can consider the following additional measures to make the current consumer bills more informative.
  - Adding a graph of the previous 12 months' consumption and helpful hints on effective water usage on the monthly bills.
  - Alert consumers of possible leaks on their properties. For instance if the consumption for a particular month is >25% than the average consumption of the previous months the consumer may be alerted of a possible leak on the property.
  - Monitor trends and follow up telephonically.

Funding and Budget Requirements:

Estimated cost to enhance the user friendliness of the municipal bill is R450 000.

Items 6 and 7: General Complaints System

Recommendation and Strategy:

The municipality needs to continue to ensure that all consumers are familiar with the telephone numbers to lodge complaints and report leaks. Telephone numbers to lodge complaints and report leaks are included on the monthly water bills and on the Municipality's website. Suggestions would be to also include it on strategically located notice boards, radio broadcasts, etc.

The projects and measures that can be implemented for passive leakage control are as follows:

- Improve the help-line and install an automated answering system.
- Advertise the help-line.
- Investigate current problems in responding to leaks and allocate adequate resources to avoid lengthy delays.
- Review and develop a policy regarding responses to leaks with the aim of reducing response time, prioritising and keeping consumers informed.
- Develop a monitoring system and quality assurance measures to ensure problems are resolved adequately. Link such a KPI to the SDBIP.
- Develop a Client Services Charter.

The Client Services Charter should include the following information:

- Commitment to deliver excellent services to our clients (Executive Mayor and Municipal Manager).
- Standards of services (Enquiries written and telephonic; Accounts enquiries and distribution of accounts).
- Response times for different services (Water: Repairs to networks, installation of new household water connections, etc.)
- Contact details for different areas.

Funding and Budget Requirements:

Budget requirement for improved customer awareness raising with regard to the Municipality's Complaints System R150 000/annum.
Budget requirements for Client Services Charter R100 000.

Item 8: Asset Register for Water Infrastructure

Recommendation and Strategy:

- Continue with the annual updating of the Asset Register.
- Continue to ensure that all the existing water and sewerage infrastructure are included in the Asset Register.

Funding and Budget Requirements:

None - To be done as part of the annual updating of the Asset Register by the municipality.

Item 9: Asset Management Capital Works

Recommendation and Strategy:

Allocate a budget of at least 2% of the total water asset value per annum towards the replacement of existing infrastructure. Municipality needs to differentiate in their capital budget between new projects and projects that are for the replacement of existing infrastructure, in order to accurately calculate the annual percentage allocated towards the replacement of existing infrastructure (Best Practice).

Funding and Budget Requirements:

Capital budget of at least 2% of the total water and sewerage asset value allocated towards the replacement of the existing water and sewerage infrastructure (Best Practice).

Item 10: Asset Management Operation and Maintenance

Recommendation and Strategy:

The municipality needs to differentiate between budget allocated towards the operation and maintenance of the water infrastructure and the budget allocated towards the replacement of the water and sewerage infrastructure. A budget of approximately 1% to 2% of the value of the system is typically required for the operations and maintenance of the system to ensure that the system remains in good condition.

Table C.5.3: Proposed WC/WDM Strategy items for Theewaterskloof Municipality

The municipality needs to compile an Asset Management Plan (AMP) to ensure efficient, effective and optimal management, operation and maintenance of all assets, which includes treatment plants, reservoirs, structures, buildings, pipelines, sites, etc. The purpose of the AMP is to:

- Ensure the operation and maintenance functions are well planned.
- Demonstrate responsible management.
- Justify and communicate funding requirements.
- Service provisioning complies with regulatory requirements.

An AMP normally includes the following:

- documents the nature, extent, age, utilization, condition, performance and value of the infrastructure work;
- identifies existing and target levels of service, as well as expected changes in demand;
- identifies the life-cycle management needs of the infrastructure (development, renewal, operations and maintenance);
- assesses capital and operational budget needs; and
- identifies infrastructure asset management improvement needs.

It is important for the municipality to develop an AMP from their Asset Register. The objective of an AMP is to support the achievement of the strategic goals of the Municipality and facilitate prudent technical and financial decision-making. It is also a vehicle for improved internal communication and to demonstrate to external stakeholders the Municipality's ability to effectively manage its existing infrastructure as well as the new infrastructure to be developed over the next 20 years.

This plan must be based on the principle of preventative maintenance in order to ensure that, as far as this is practical, damage to assets is prevented before it occurs. The municipality needs to ensure that the maintenance and rehabilitation plan is part of the WSDP and that the plan is implemented. Assets must be rehabilitated and / or replaced before the end of their economic life and the necessary capital funds must be allocated for this purpose. Priority should be given to rehabilitating existing infrastructure as this generally makes best use of financial resources and can achieve an increase in (operational) services level coverage's most rapidly. The preparation of maintenance plans and the allocation of sufficient funding for maintenance are required to prevent the development of a large condition backlog. The potential renewal projects for the water infrastructure need to be identified from the Asset Register. All assets with a condition grading of "poor" and "very poor" need to be prioritised.

The O&M Budget allocated towards repairs and maintenance should include the replacement of malfunctioning and old bulk water meters and consumer water meters, clearing of meter chambers, buying replacement mechanisms for bulk water meters, speedy repair of leaks, leak detection in areas with high water losses and NRW and higher than expected night flows, etc. The budget should also be used for preventative maintenance, which include the following:

- Inspection of isolation valves and packing.
- Control valve inspection and maintenance.
- Inspection of cathodic protection of steel pipes.

Funding and Budget Requirements:

Additional budget should be allocated towards the repairs and maintenance of the existing water infrastructure. The additional budget should be determined by the municipality once an AMP is developed. A budget of approximately 1% to 2% of the value of the system is typically required for the operations and maintenance of the system to ensure that the system remains in good condition (Best Practice).

An estimated budget for the drafting of an AMP for all the water infrastructure is R850 000.

Item 11: Dedicated WC/WDM Support

Recommendation and Strategy:

The municipality should allocate at least one (1) person to head WC/WDM for a start. The number of people involved with WC/WDM measures can later be increased as and when required.

Funding and Budget Requirements:

The municipality may be able to use one of their existing staff members. If a new person has to be appointed the municipality can determine the costs involved with such an appointment.

Item 12: Active Leakage Control

Recommendation and Strategy:

The following process needs to be followed for active leakage control of the reticulation network:

Decide on how the work will be undertaken:

- Option 1: The appointment and training of additional staff.
- Option 2: The training of existing staff.
- Option 3: Appoint an external contractor in the first few years with the objective of using this contractor to train the internal teams and build capacity to do all work internally.
- Option 4: Complete outsourcing of the activity.

The first three options need to include the purchase or re-allocation of equipment.

Leak detection: Identify areas with highest leaks and send teams into the field to detect leaks.

Repair of leaks once identified: Once leaks were detected they will need to be repaired. Depending on the extent of the leaks and other workloads, the leak repairs need to be carried out by either the internal teams or a contractor.

Funding and Budget Requirements:

R450 000 to undertake leak detection in zones with high excess night flows. In addition allocate approximately R200 000 per year for general visual leak inspections.

Table C.5.3: Proposed WC/WDM Strategy items for Theewaterskloof Municipality

Item 13: Sectorization of Reticulation Systems

Recommendation and Strategy:

The billed metered data currently linked to the eight distribution systems should also be linked to the different reservoir zones in the future where possible, in order to accurately determine the NRW and water losses for the specific zones in the future. Faulty bulk water meters need to be replaced and new meters need to be installed for the zones with no bulk water meters. The current bulk water meters are indicated in Table 5.1.2.3.1 of Topic 5 of the Administration, Information and Comprehensive Overview Report.

The Financial Department needs to provide the billed metered consumption data separately for Bereaville, Voorstekraal, Boschmanskloof, Genadendal, Greyton and Heuwelkroon. Sectorization will assist with the following:

- Clear indication of how much water is being used per area / zone.
- Areas with high NRW and water losses can easily be identified.
- Leakage and pressure control can be better managed.
- Water demand per area / zone can be determined.

Night flows need to be measured for zones with expected high water losses. It is recommended to re-log the night flows every few years to determine if there was an increase in leakage.

Funding and Budget Requirements:

The estimated cost for the logging of flows and pressures for zones with expected high water losses is R500 000. The logging exercise should be repeated at least every three years.

A budget should be allocated to investigate and resolve possible zone interconnections. It is however difficult to price such investigations at this stage.

Item 14: Effective Bulk Metering Management System

Recommendation and Strategy:

- All bulk water meters at existing WTWs, reservoirs and pump stations need to be read and recorded on at least a weekly basis.
- Broken bulk water meters need to be repaired or replaced.
- All bulk water meters need to be installed in lockable meter chambers and reservoir sites and water pump stations need to be secured in order to prevent unauthorised access and possible damage to the water meters.
- New bulk water meters need to be correctly installed. Ideally a straight pipe section upstream of the meter of at least 5x the meter dia. and 3x the meter dia. downstream of the meter. Strainers need to be installed to protect the meters. These strainer elements must be removable from the top, for ease of cleaning. Gate valves are required for maintenance before and after meters.
- Every informal area with communal services to be supplied with a bulk water meter in order to determine the unbilled metered consumption. All discrete zones are to be supplied with a bulk water meter. The meter readings must be recorded on at least a weekly basis. The readings can be used to quantify both the water supplied and the leakage for a specific zone.

Funding and Budget Requirements:

Allow an annual budget of approximately R500 000 for the installation of new bulk water meters, the replacement of faulty bulk water meters and to adequately protect existing bulk water meters.

Item 15: Effective Zone Meter Management and Assessment of Night Flows

Recommendation and Strategy:

See recommendations under Item “Effective Bulk Metering Management System” above.

Funding and Budget Requirements:

See funding and budget requirements included under Item “Effective Bulk Metering Management System” above.

Item 16: Pressure Management

Recommendation and Strategy:

The reticulation networks need to be divided into pressure zones, prior to implementing pressure management, and the pressures and flows need to be metered and logged. The activities of such a programme are as follows:

- Undertake feasibility studies to determine the ranking of areas / projects (Desktop Study, Logging of pressures and flows, Analysis of data).
- Implement advanced pressure management in areas identified (Design PRV Chambers, Pressure management implementation of new PRVs, Supply and installation of smart electronic pressure controllers for existing PRVs).
- Impact assessment (Post pressure management logging to determine impact of new PRVs and / or installation of smart pressure controllers on existing PRVs).
- The on-going operation, maintenance and optimisation of advanced pressure management installations.

Funding and Budget Requirements:

- See funding and budget requirements included under Item “Pressurised System at all times” above.

Item 17: As-built Drawings of Bulk and Reticulation Infrastructure

Recommendation and Strategy:

Continue with the regular updating of the Water and Sewer Master Plans.

Funding and Budget Requirements:

Allow a budget of approximately R1.8 million for the updating of the Water and Sewer Master Plans every five years.

Item 18: Schematic Layouts of Water Reticulation Systems

Recommendation and Strategy:

Municipality needs to continue to update the schematic layouts on a regular basis, in order to ensure they remain accurate.

Funding and Budget Requirements:

Table C.5.3: Proposed WC/WDM Strategy items for Theewaterskloof Municipality
None
Item 19: Regulation and Bylaws
Recommendation and Strategy: The Water and Sanitation Services By-law need to be enforced and adequate human resources need to be allocated for this purpose.
Funding and Budget Requirements: No additional budget or funding requirements. Enforcement to be implemented through existing budgets.
Item 20: Tariffs
Recommendation and Strategy: See Section 7.3 under Topic 7 of the Future Demand and Functionality Requirements Water Services Master Plan.
Funding and Budget Requirements: Financial study to determine the impact of changing the water tariffs and changing the sanitation tariff structure from a fixed monthly amount, which is also not based on the number of toilet pans, to a stepped tariff based on water consumption in the future. Estimated cost R300 000.
Item 21: Technical Support to Customers
Recommendation and Strategy: The objective of a Technical Support programme is not limited to assisting consumers in reducing their water demand, but is also to look at wastewater, monitor compliance with by-laws and service conditions and offer general customer support. Once a dedicated person has been allocated to WC/WDM it is recommended to engage with large customers and to identify areas where the municipality can provide assistance. The proposed activities of this programme that can be budgeted for are as follows: • Train existing staff; • Identify and visit large consumers (Checking that large consumers are correctly metered and billed, providing tips on WC/WDM, test the accuracy of all large consumer meters, install data-loggers on all large consumer meters and informing consumers of any sudden change in consumption patterns). • Arrange leakage inspections in public building; • Provide assistance and technical know-how for large consumers; and • Introduce compulsory water management plan for large consumers.
Funding and Budget Requirements: No additional funding – pending the appointment of a dedicated person for WC/WDM.
Item 22: Removal of Un-authorised Connections
Recommendation and Strategy: Swift Analysis needs to be done to determine the unmetered erven and meters need to be installed at all the unmetered erven. An estimated 2 183 unmetered erven were previously identified as part of the 2019 Swift Analysis. See Section 5.1.1.5 of the Future Demand and Functionality Requirements Report.
Funding and Budget Requirements: Estimated budget of R10.915 million is required to install water meters at the potential unmetered erven.
Item 23: Community Awareness on WDM
Recommendation and Strategy: See Section 5.1.3 of the Future Demand and Functionality Requirements Report.
Funding and Budget Requirements: It is estimated that R150 000 / year should be allocated for WC/WDM awareness campaigns and activities, material to be included with monthly water bills, placing notices in newspapers, billboards, competitions, etc.
Item 24: Schools Education on WDM
Recommendation and Strategy: See Section 5.1.3.1 of the Future Demand and Functionality Requirements Report.
Funding and Budget Requirements: It is estimated that a budget of R50 000 per year should be allocated for the establishment of a schools education programme in Theewaterskloof Municipality. The DWS can also assist the municipality with pamphlets and posters on WC/WDM initiatives.
Item 25: Retrofitting
Recommendation and Strategy: See Sections 5.1.2.1 and 5.1.2.2 of the Future Demand and Functionality Requirements Report.
Funding and Budget Requirements: Leak repair assistance programmes: R300 000 per annum for ongoing exercise to repair leakages at indigent properties using in excess of 20 kl/month. WSIG funding or "War on Leaks" funding from DWS can be requested in this regard. Retrofitting: R500 000 for a pilot project in one of the public buildings.

The way forward for Theewaterskloof Municipality with the implementation of the proposed WC/WDM Strategy is as follows:

- Develop a detailed methodology for measuring the performance criteria for each of the twenty-five (25) WC/WDM Strategy items;
- Allow for budget required to implement the various measures;
- Monitor the impact of all WC/WDM measures on an on-going basis;
- Develop key benchmarks for all KPIs and categories and assign responsibility; and
- Review WC/WDM Strategy as necessary.

Theewaterskloof Municipality needs to ensure that adequate funding is allocated under their Capital and Operational budgets towards the implementation of their WC/WDM Strategy. Key WDM projects to be taken into account during Theewaterskloof Municipality's capital budgeting process are as follows:

- Replacement of old water networks (Areas with regular pipe bursts)
- Replacement of old bulk and consumer water meters (Meter replacement programme)
- Telemetry systems to provide for early warning
- Installation of zone meters
- Pressure Management
- Leak detection
- Data loggers to establish MNFs

The WDM initiatives can deliver excellent return on investment if well implemented and well managed. All external funding that could be utilised by Theewaterskloof Municipality for this purpose should be sourced. The O&M Budget allocated to repairs and maintenance should be increased to address amongst other tasks the following:

- Replacement of malfunctioning and old bulk water meters and consumer meters;
- Construction of meter chambers for all bulk water meters not adequately protected against vandalism;
- Cleaning of bulk water meter boxes;
- Buying replacement mechanisms for bulk meters;
- Speedy repair of leaks; and
- Leak detection in areas with higher than expected night flows.

Theewaterskloof Municipality has responded to the need to address NRW and water losses within their jurisdiction by implementing various WC/WDM initiatives over the last number of years. The Municipality will also continue to actively implement the proposed WC/WDM Strategy in order to reduce the percentage of NRW and Water Losses even further and improve water use efficiency within the various schemes as follows.

Table C.5.4: Commitment to reduce water losses and water inefficiencies

Scheme	2023/2024		Committed Future Water Losses	
	NRW (%/a)	Water Losses (%/a)	2028 (%/a)	2048 (%/a)
Bot River	40.8%	24.6%	20.0	15.0
Caledon	38.4%	32.1%	25.0	10.0
Greater Genadendal	50.0%	41.7%	35.0	15.0
Grabouw	65.6%	4.4%	10.0	10.0
Greyton	39.0%	38.8%	30.0	15.0
Riviersonderend	23.5%	19.9%	15.0	15.0
Tesselaarsdal	48.1%	47.9%	35.0	15.0
Villiersdorp	18.9%	0.0%	10.0	10.0

IWA Water Balance: The Revised Compulsory National Water and Sanitation Standards, as published in Government Gazette No.52814 of 6 June 2025, include the following water and wastewater balance analysis and determination of water losses requirements:

- A Water Services Institution must install and monitor appropriate water measuring devices or volume controlling devices to measure, detect and account for the volume of water abstracted (surface or groundwater), treated and consumed, as applicable to the technical configuration of infrastructure and the water use authorisation conditions.

- A Water Services Institution must install and monitor appropriate water measuring devices or volume controlling devices to measure, detect and account for the volume of water consumed to all user connections as applicable to the technical configuration of infrastructure.

- A Water Services Institution must install and monitor appropriate measuring devices or volume controlling devices to measure, detect and account for the volume of wastewater received at pump stations and the inlet of the WWTW. A WSA shall record minimum night flows, peak wet weather flow and average dry weather flow received at the inlet of a WWTW received from all user connections conveyed, as applicable to the technical configuration of infrastructure and the water use authorisation conditions.

- A Water Services Institution must install and monitor appropriate measuring devices or volume controlling devices to measure, detect and account for the volume of wastewater discharged into the water resource as applicable to the technical configuration of infrastructure and the water use authorisation conditions.

- A Water Services Institution must ensure that all measuring devices or meters are properly maintained and in good working order, implementing a programme for meter in-situ verification and / or calibration.

- A Water Services Institution must account for its water balance on a monthly basis as follows:
  - Measure the daily volume abstracted and treated; and
  - Measure the quantity of water provided to each supply zone within its supply area.

- A Water Services Institution must account for its wastewater balance on a monthly basis as follows:
  - daily inflows in Ml/d; and
  - daily outflows in Ml/d.

- A Water Services Institution must determine the quantity of water losses and NRW in accordance with the Guideline for the preparation of an IWA Water Balance to determine NRW and Water Losses.

- The results of the water balance analysis and the records of the quantities of water measured must be reported to the Department's National Regulatory Information Management System on a quarterly basis.

A segregated single variable future water requirement model was developed for the WSDP and is available in electronic format. The future water requirement for each of the schemes is obtained by means of this model. It is used in this analysis to estimate the future water requirement for each of the distribution systems. The model differentiates between the different income levels.

Theewaterskloof Municipality is committed to address the challenges with regard to the flow meters at the various WWTWs for the inflow to the plants, the quantity of treated effluent re-used and the quantity of treated effluent returned to the Water Resource System.

Water services must be provided in a manner that is consistent with the broader goals of integrated water resources management. There is therefore a need for an integrated planning approach between the development of water services and water resources.

The Infrastructure Leakage Index (ILI) can be used by Theewaterskloof Municipality to determine an appropriate benchmark for managing the water losses according to their own specific circumstances. This ILI can also be compared with the averages for other towns within South Africa. The annual water losses within the various towns' distribution networks are therefore important indicators of the performance of the water supply and distribution systems.

Theewaterskloof Municipality should assess the strategic gaps in their IWA water balance data and record those flows, both water and sewerage, which are strategic in terms of medium to long term planning. A prioritisation of these locations should subsequently follow with budget allocated to improve the availability and accuracy of the IWA water balance data.

Theewaterskloof Municipality should continue to update their IWA water balance models on a monthly basis in order to determine the locations of wastage and to enable the Municipality to manage their NRW and Water Losses. The water balance will not directly lead to the reduction of the demand, but is an imperative management tool that will inform the implementation of demand side management initiatives.

Theewaterskloof Municipality is committed to keep record of all bulk meter readings, flows at WWTWs and to update the water balance models on a monthly basis in order to determine locations of wastage and to enable Theewaterskloof Municipality to actively implement the WC/WDM Strategy in order to reduce their current NRW and water losses. **All bulk zone water meters also need to be recorded on at least a monthly basis (Meters at reservoirs and pump stations).**

Theewaterskloof Municipality needs to focus on the following for the IWA water balances of the various water distribution systems.

Swift Analysis of the Billed Metered Consumption data needs to be done. The Swift Analysis results need to be used to inspect the following erven in each of the towns, once it becomes available.

- Identified potential unmetered erven need to be inspected and water meters need to be installed if the connections are found to be unmetered.
- Identified erven with water meters, but with zero demand, need to be inspected and new water meters need to be installed if the existing water meters are found to be faulty.
- Metered erven with very low consumption need to be inspected.
- Metered erven with a drastic increase or decrease in consumption need to be inspected.

The following areas need to be focused on for the IWA water balance of the Bot River System.

- Flow meter of Borehole No.5 needs to be replaced, currently not operational.
- It was not possible to calculate the Treatment Losses, because the readings of the final water meters at the WTW were not received (Readings of bulk water meter after lime stabilization and 100mm dia. bulk water meter for supply to town at the WTW).
- Vandalised flow meter for the supply to the informal areas needs to be replaced. Readings of this meter need to be recorded on at least a monthly basis once installed.
- Meter chambers to be constructed for all bulk water meters, with lockable covers.

The following areas need to be focused on for the IWA water balance of the Caledon System.

- The monthly volume of raw water and final water at the Ikusas WTW package plant were not made available and it was therefore not possible to calculate the treatment losses for the plant.
- The meter readings for the two boreholes were not received for the last number of years and it was therefore not possible to calculate the volumes of water supplied from the two individual boreholes and from the Newmark dam.
- Municipality needs to start with the installation of zone meters in order to calculate the monthly water usage for each of the zones and to monitor the NRW and Water Losses for specific zones.
- The monthly flow readings and volumes of the final effluent discharged from the Caledon WWTW were not made available.

The following areas need to be focused on for the IWA water balance of the Greater Genadendal System, which include Bereaville, Voorstekraal and Genadendal.

- The monthly readings and volumes for the bulk raw water meter and final water meter at the Bereaville WTW need to be made available. These volumes can be used as additional checks for the volume of water treated at the Bereaville WTW.
- The vandalized bulk raw water and final water meter at the Voorstekraal WTW need to be replaced. These meters act as check meters for the Voorstekraal package plant. The monthly readings and volumes supplied from the Voorstekraal borehole need to be made available.
- Monthly readings and volumes for the Bereaville and Voorstekraal package plants need to be made available in order to calculate the treatment losses for these two package plants.
- Monthly readings and volumes for the two Genadendal bulk water meters (Raw and Final water meter at the WTW) need to be made available in order to calculate the treatment losses for the plant.
- Billed metered consumption data needs to be provided separately for Genadendal, Bereaville and Voorstekraal in order to compile separate IWA Water Balances for each of these three systems.
- The vandalized inflow meter (probe) at the Genadendal WWTW needs to be repaired. An outflow meter also needs to be installed for the final effluent discharged from the Genadendal WWTW.

The following areas need to be focused on for the IWA water balance of the Grabouw System.

- The faulty bulk raw water meter at the Grabouw WTW needs to be repaired or replaced, in order to accurately calculate the treatment losses for the plant. The meter also act as check meter for the volume of water supplied from the Groenland WUA and will give an indication of the bulk water distribution losses.
- Monthly readings and volumes for the two final water bulk meters at the Grabouw WTW need to be made available in order to calculate the treatment losses for the plant.
- Municipality needs to start with the installation of zone meters in order to calculate the monthly water usage for each of the zones and to monitor the NRW and Water Losses for specific zones.

The following areas need to be focused on for the IWA water balance of the Greyton System.

- Monthly readings and volumes for the Greyton package plant need to be made available in order to calculate the treatment losses for the package plant.
- Monthly readings and volumes for the Gobos Borehole to be made available.
- Two faulty bulk water meters at the Vlei Street Booster PS need to be repaired or replaced.
- Bulk water meter needs to be installed on the rising main of the Gobos Stream PS.
- Bulk water meters need to be installed in order to accurately calculate the volume of water supplied from the various water resources (Wolwekloof and Gobos River).
- Monthly volumes and readings for the supply from Boschmanskloof need to be made available.
- A flow meter needs to be installed at the WWTW in the future for the monitoring of the final effluent discharged from the plant.

The following areas need to be focused on for the IWA water balance of the Riviersonderend System.

- Monthly readings and volumes of the two bulk water meters at the raw water PS to be made available in order to calculated the volume of water supplied from the two water resources (Riviersonderend River and Olifantsbos).
- Bulk water meters need to be installed on the inlet and outlet of the WTW.
- The vandalized bulk water meter at the reservoirs outlet to be replaced.
- Final effluent re-used for the irrigation of the golf course to be metered and readings to be recorded.

The following area needs to be focused on for the IWA water balance of the Tesselaarsdal System.

- The faulty bulk water meter on the outlet of the reservoirs to be repaired or replaced.

The following areas need to be focused on for the IWA water balance of the Villiersdorp System.

- Supply from the Kommissiekraal River needs to be metered.
- Monthly readings and volumes of the water pumped from the new Ham Street Pump Station to 19 Damme to be made available.
- Monthly readings and volumes of the bulk water supplied from the WTW under gravity to the town (150mm dia. bulk water meter) to be made available.
- Municipality needs to start with the installation of zone meters in order to calculate the monthly water usage for each of the zones and to monitor the NRW and Water Losses for specific zones.
- Inflow and outflow bulk water meters need to be installed at the new WTW.

NRW and Water Losses:

Bot River: The current treatment losses was estimated at 15%, because meter readings were not available for the System Input Volume. The NRW and Water Losses decreased over the last financial years, which is good. The NRW percentage is above the DWS's target of 30% and the Municipality needs to continue with the implementation of specific WC/WDM measures to reduce the NRW and water losses. The Municipality needs to work towards a NRW target below 30% and a water losses target below 20% for the Bot River system. The ILI between 2.0 and 4.0 value indicates a good system and no urgent action is required, but the NRW and Water Losses should however be monitored carefully.

Caledon: The NRW and water losses decreased over the last financial year, which is of excellent. The NRW percentage is above the DWS's target of 30% and the Municipality needs to continue with the implementation of specific WC/WDM measures to reduce the NRW and water losses. The Municipality needs to work towards a NRW target below 30% and a water losses target below 25% for the Caledon system. The Municipality needs to continue with the implementation of specific WC/WDM measures to reduce the NRW and water losses. The current ILI value above 4.0 indicates a poor management system, which require specific NRW and water loss reduction interventions.

Greater Genadendal: The inflow and outflow meter readings of the Bereaville WTW, Voorstekraal WTW and Genadendal WTW need to be recorded, in order to accurately calculate the treatment losses for these three WTWs. The NRW and water losses were decreased during the last financial year, but are still extremely high and above DWS's NRW target of 30%. The Municipality needs to work towards a NRW target below 30% and a water losses target below 25% for these three systems. The Municipality needs to continue with the implementation of specific WC/WDM measures to reduce the NRW and water losses. The ILI value between 2.0 and 4.0 indicates a good management system and no urgent action is required, but the NRW and Water Losses should however be monitored carefully.

Grabouw: The current treatment losses was estimated at 5%, because meter readings were not available for the System Input Volume. The NRW stayed roughly the same for the last two financial years. An estimated water usage volume for the large number of informal dwellings was included in the water balance for 23/24, therefore the very low water losses percentage for the last financial year. The NRW is extremely high and above DWS's NRW target of 30%. The Municipality needs to work towards a NRW target below 30% for the Grabouw system. Bulk zone meters needs to be installed for the informal areas, in order to accurately meter the water usage of the informal areas. The Municipality needs to continue with the implementation of specific WC/WDM measures to reduce the NRW and water losses. The ILI value of 1.00 indicates an excellent management system, with no specific intervention is required. The Municipality needs to keep the ILI level below 2. Bulk zone meters need to be installed for the informal areas to better quantify the unbilled metered consumption volumes.

Greyton: The inflow and outflow meter readings of the Greyton WTW need to be recorded, in order to accurately calculate the treatment losses for the WTW. The NRW and water losses were decreased during the last financial year, which are excellent. The NRW percentage is however still above the DWS's NRW target of 30% and the Municipality needs to continue with the implementation of specific WC/WDM measures to reduce the NRW and water losses. The Municipality needs to work towards a NRW target below 30% and a water losses target below 25% for the Greyton system. The current ILI value above 4.0 indicates a poor management system, which require specific NRW and water loss reduction interventions.

Riviersonderend: The current treatment losses was estimated at 15%, because meter readings were not available for the raw water volumes. The NRW increased and the Water Losses decreased over the last financial year. The current NRW and water losses percentages are below DWS's NRW target of 30%, which is good. The Municipality needs to keep the NRW target below 25% and the water losses below 20% for the Riviersonderend system. The Municipality needs to continue with the implementation of specific WC/WDM measures to reduce the NRW and water losses. The ILI value of 1.36 indicates an excellent management system, with no specific intervention is required. The Municipality needs to keep the ILI level below 2.

Tesselaarsdal: It was not possible to calculate the treatment losses, because readings were only available for the borehole abstraction volume. The NRW and water losses increased drastically during the last financial year, which is of concern. The NRW and water losses for the last financial year were extremely high and above DWS's NRW target of 30%. The Municipality needs to work towards a NRW target below 30% and a water losses target below 25% for the Tesselaarsdal system. The Municipality needs to continue with the implementation of specific WC/WDM measures to reduce the current high NRW and water losses. The ILI value of 1.16 indicates an excellent management system, with no specific intervention is required. The Municipality needs to keep the ILI level below 2.

Villiersdorp: It was not possible to calculate the treatment losses, because readings were only available for the System Input Volume. The NRW decreased during the last financial year, which is good. An estimated water usage volume for the large number of informal dwellings was included in the water balance for 23/24, which resulted in a negative water losses percentage. Bulk zone meters needs to be installed for the informal areas, in order to accurately meter the water usage of the informal areas. The Municipality needs to continue with the implementation of specific WC/WDM measures to reduce the NRW and water losses. The Municipality needs to work towards a NRW target below 20% and a water losses target below 15% for the Villiersdorp system. The current ILI value is negative. Bulk zone meters need to be installed for the informal areas to better quantify the unbilled metered consumption volumes.

Theewaterskloof Municipality (All Systems): The NRW and water losses for all the systems combined decreased during the last financial year, which is good. The overall NRW is however still extremely high and above DWS's NRW target of 30%. The Municipality needs to work towards a NRW target below 30% and a water losses target below 25%. Bulk zone meters needs to be installed for the informal areas, in order to accurately meter the water usage of the informal areas (Unbilled Metered Consumption). The Municipality needs to continue with the implementation of specific WC/WDM measures to reduce the NRW and water losses.

TOPIC 6: WATER RESOURCES

Topic C.6.1: Water Resources						
Section	**Intervention Required?**	**% (1)**	**Solution description as defined by topic situation assessment**	**% (2)**	**Is there an Existing project/activity addressing this problem?**	**Current Demand Overall Scoring % (3)**
Current Water Sources	Yes	100.0	Ensure the required authorisations (licences) are in place for all the water resources, as well as the required registrations.	100.0	Partially	85.7
Additional Sources Available	Yes	100.0	Continue with investigations of the augmentation of the existing bulk water sources for the various towns.	100.0	Partially	85.7
Monitoring	Yes	100.0	Implement Groundwater Management Plan for all production boreholes (Water levels, abstraction volumes and water quality).	100.0	Partially	78.6
Water Quality	Yes	100.0	Increase the water quality operational sampling programme to ensure compliance with SANS241:2015 requirements.	100.0	Partially	85.7

Topic C.6.1: Water Resources						
Section	**Intervention Required?**	**% (1)**	**Solution description as defined by topic situation assessment**	**% (2)**	**Is there an Existing project/activity addressing this problem?**	**Current Demand Overall Scoring % (3)**
	Yes	100.0	Increase the effluent operational sampling programmes at the WWTWs, in order to ensure proper process control.	100.0	Partially	85.7
Operation	Yes	100.0	Ensure that all industries apply for the discharge of industrial effluent into the sewer system, to monitor the quality and volume of industrial effluent discharged and to implement the set of by-laws with regard to the discharge of industrial effluent into Theewaterskloof Municipality's sewer system in order to determine whether the quality comply with the standards and criteria.	100.0	Partially	85.7

Notes: (1) Is this section addressed in the WSDP?
(2) Were solutions identified for the possible gaps?
(3) Percentage calculated based on the above two percentages and whether there is an existing project/activity addressing this problem? Does this current listed project/activity address the problem totally? Project/Activity approved by Council as part of WSDP database? Approved by Council in project activity database and part of 5yr IDP cycle projects? Project/Activity listed in 3yr MTEF Cycle?

Metering of all water supplied is one of the most significant steps in order to properly plan and manage water sources. Without metering no management is possible. Theewaterskloof Municipality needs to continue with the monthly reading of all their existing bulk water meters, which is a valuable source of information.

The uncertainty in projected water-related climate change impacts is one of the biggest challenges facing water managers. The managers must understand how this uncertainty influences the management decisions to be made and that decisions must be appropriate to a possible range of scenarios. A critical tool in this regard is adaptive management, in which water resource systems are carefully monitored and management actions are tailored and revised in relation to the measured changes on the ground. One cannot predict climate change impacts with any certainty, and the recognition of this uncertainty must be built into all climate change response strategies.

Future water requirement projection models were developed for each of the schemes in Theewaterskloof Municipality's Management Area. These models include the future projections up to 2048 and were calibrated by using historic billed metered consumption data and bulk metered abstraction data. The percentage water losses was determined for each of the distribution systems and growth in demand was based on agreed population and growth figures. The projected future water requirements and the surplus or shortfalls are indicated in the table below for each of the schemes.

Table C.6.2: Projected future water requirements and yield / registration / licence Surplus (+) / Shortfall (-) based on WSDP Model

Distribution System	Projection	POJECTED FUTURE WATER REQUIREMENTS (Ml/a)				
		2028	**2033**	**2038**	**2043**	**2048**
Bot River	2.0% Annual Growth	322.128	355.655	392.672	433.541	478.665
	4.0% Annual Growth	354.972	431.878	525.445	639.284	777.787
	WSDP Model	**315.228**	**358.286**	**408.102**	**465.796**	**532.676**
	Registration surplus (+) / shortfall (-)	**+252.420**	**+209.362**	**+159.546**	**+101.852**	**+34.972**
Caledon	2.0% Annual Growth	1 702.459	1 879.653	2 075.289	2 291.286	2 529.765
	4.0% Annual Growth	1 876.042	2 282.492	2 777.001	3 378.646	4 110.640
	WSDP Model	**1 589.433**	**1 712.558**	**1 851.610**	**2 008.369**	**2 184.882**
	Yield surplus (+) / shortfall (-)	**+999.701**	**+876.576**	**+737.524**	**+580.765**	**+404.252**
Greater Genadendal	2.0% Annual Growth	415.221	458.438	506.153	558.833	616.997
	4.0% Annual Growth	457.557	556.689	677.297	824.035	1002.565
	WSDP Model	**355.569**	**346.982**	**340.385**	**335.451**	**331.929**
	Yield surplus (+) / shortfall (-)	**+2 573.951**	**+2 582.538**	**+2 589.135**	**+2 594.069**	**+2 597.591**
Grabouw	2.0% Annual Growth	2 855.945	3 153.194	3 481.381	3 843.725	4 243.783
	4.0% Annual Growth	3 147.137	3 828.973	4 658.531	5 667.815	6 895.764
	WSDP Model	**3 175.435**	**3 678.813**	**4 272.580**	**4 974.020**	**5 803.854**
	Allocation surplus (+) / shortfall (-)	**+1 244.565**	**+741.187**	**+147.420**	**-554.020**	**-1 383.854**

Table C.6.2: Projected future water requirements and yield / registration / licence Surplus (+) / Shortfall (-) based on WSDP Model						
Distribution System	**Projection**	**POJECTED FUTURE WATER REQUIREMENTS (Ml/a)**				
		2028	**2033**	**2038**	**2043**	**2048**
Greyton	2.0% Annual Growth	285.910	315.668	348.523	384.797	424.847
	4.0% Annual Growth	315.062	383.321	466.368	567.408	690.339
	WSDP Model	**247.454**	**256.723**	**267.318**	**279.302**	**292.755**
	Registration surplus (+) / shortfall (-)	**+277.091**	**+267.822**	**+257.227**	**+245.243**	**+231.790**
Riviersonderend	2.0% Annual Growth	406.211	448.490	495.169	546.706	603.608
	4.0% Annual Growth	447.628	544.608	662.599	806.153	980.808
	WSDP Model	**386.293**	**431.088**	**481.451**	**538.102**	**601.857**
	Registration surplus (+) / shortfall (-)	**+34.955**	**-9.840**	**-60.203**	**-116.854**	**-180.609**
Tesselaarsdal	2.0% Annual Growth	68.120	75.210	83.037	91.680	101.222
	4.0% Annual Growth	75.065	91.328	111.115	135.188	164.477
	WSDP Model	**55.530**	**57.509**	**59.890**	**62.676**	**65.877**
	Yield surplus (+) / shortfall (-)	**+22.230**	**+20.251**	**+17.870**	**+15.084**	**+11.883**
Villiersdorp	2.0% Annual Growth	863.226	953.072	1 052.268	1 161.789	1 282.709
	4.0% Annual Growth	951.241	1 157.330	1 408.069	1 713.131	2 084.286
	WSDP Model	**849.286**	**972.808**	**1 115.199**	**1 279.401**	**1 468.820**
	Yield surplus (+) / shortfall (-)	**-225.706**	**-349.228**	**-491.619**	**-655.821**	**-845.240**

The table below gives an overview of the years in which the annual water requirements is likely to exceed the sustainable yields of the various resources.

Table C.6.3: Years in which the annual water requirement will exceed the sustainable Yields / Registration / License volumes from the various water resources				
Distribution System	**Total Sustainable Yield (Y) / WARMS Registration (R) / Service Level Agreement (SLA) Volume (x 10^6 m^3/a)**	**Annual Growth on 2023/2024 requirement (2.0%)**	**Annual Growth on 2023/2024 requirement (4.0%)**	**WSDP Projection**
Bot River	0.567648 (Y)	> 2048	2039	> 2048
Caledon	2.589134 (SLA & R)	> 2048	2036	> 2048
Greater Genadendal	2.929520 (Y)	> 2048	> 2048	> 2048
Grabouw	4.420000 (SLA)	> 2048	2036	2039
Greyton	0.525 (R & Y)	> 2048	2040	> 2048
Riviersonderend	0.421248 (Y)	2029	2026	2031
Tesselaarsdal	0.077760 (Y)	2034	2028	> 2048
Villiersdorp	0.624 (SLA & R)	Over	Over	Over

It can be noted from the previous tables that sources of most of the towns are adequate to meet the short to medium future water requirements. The most critical augmentation projects at this stage are the following:

- The bulk raw water pipeline for supply from the Olifantsbos to Riviersonderend needs to be repaired and put back into operation.
- Groundwater production boreholes of Villiersdorp to be refurbished and put back into operation.
- Develop a second production borehole for Tesselaarsdal.
- Determine the safe yield of the sources supplying Greyton and Boschmanskloof.

The DWS is currently busy with the updating of the All Towns Reconciliation Strategies for the Western Cape, but updated strategies for Theewaterskloof Municipality are not yet available. The table below gives an overview of the recommended potential future water resources, as included in the 2015 All Towns Reconciliation Strategies, for the towns in Theewaterskloof Municipality.

Table C.6.4: Potential future water resources for the various towns (DWS's updated 2015 All Towns Reconciliation Strategies)

Distribution System	Option	Potential
Bot River	**Summary**	**The current water sources have adequate supply to cater for the medium and longer term future requirements. The following sources are identified as potential sources to augment the water supply (In order of priority and implementation sequence):** • **Continue with the full implementation of the WC/WDM Strategy.** • **Optimise the aquifer and well-field management.** • **Additional groundwater development in the TMG aquifers.**
Caledon	**Summary**	**The current water sources do not have adequate supply to cater for the long-term future water requirements under the high growth scenario. The following sources are identified as potential sources to augment the water supply (In order of priority and implementation sequence):** • **Continue with the full implementation of the WC/WDM Strategy measures.** • **Increase allocation from the Ruensveld West Scheme.** • **Groundwater development in the TMG Aquifers.** • **Re-using water from the warm water springs; when required.**
Greater Genadendal	**Summary**	**The current water supply will meet the future water requirements, even in the high growth scenario. The following resource options are proposed as potential sources to augment the current water supply beyond 2040 or earlier if this is required:** • **Continue with the full implementation of the WC/WDM Strategy to reduce the non-revenue water and water losses.** • **Groundwater development** • **Rainwater harvesting** • **Abstraction from the Riviersonderend River**
Grabouw	**Summary**	**The current water sources have adequate supply to cater for the future water requirements under all three scenarios. The following sources are identified as potential sources to augment the current water supply when it becomes necessary (In order of priority and implementation sequence):** • **Continue with the full implementation of the WC/WDM Strategy measures to reduce the non-revenue water and water losses.** • **Groundwater development of TMG Aquifer for conjunctive use with Eikenhof Dam.**
Greyton / Boschmans-kloof	**Summary**	**The current water supply will meet the future water requirements, even for the high growth scenario. The following resource options are proposed as potential sources to augment the current water supply beyond 2040 or earlier if this is required (In order of priority and implementation sequence):** • **Continue with the full implementation of the WC/WDM Strategy measures.** • **Groundwater development** • **Abstraction from the Riviersonderend River** • **Rainwater harvesting**
Riviersonderend	**Summary**	**The current water supply will meet the future water requirements, even for the high growth scenario. The following source options are proposed as potential sources to augment the current water supply beyond 2040 or if required at an early stage (In order of priority and implementation sequence):** • **Continue with the full implementation of the WC/WDM Strategy.** • **Further allocation from the Riviersonderend River.** • **Groundwater development of the TMG Aquifers.** • **Rainwater harvesting.**
Tesselaarsdal	**Summary**	**The current water supply will meet the future water requirements, even for the high growth scenario. The following source options are proposed as potential sources to augment the current water supply beyond 2040 or if required at an early stage (In order of priority and implementation sequence):** • **Continue with the full implementation of the WC/WDM Strategy in order to reduce the non-revenue water and water losses.** • **Groundwater development.** • **Rainwater harvesting.** • **Abstracting water from the Hartebees / Klein River.**
Villiersdorp	**Summary**	**The current bulk water yield appears to be inadequate and a theoretical shortfall is already experienced under all future growth scenarios. The following interventions should be**

Table C.6.4: Potential future water resources for the various towns (DWS's updated 2015 All Towns Reconciliation Strategies)		
Distribution System	**Option**	**Potential**
		considered and the following resource options are proposed as potential sources to augment the current water supply (In order of priority and implementation sequence): • **Continue with the full implementation of the WC/WDM Strategy.** • **Groundwater development in the TMG Aquifer.** • **A further allocation from the Elandskloof Government Water Scheme.** • **Re-use of water.**

Volumes are registered on the DWS's WARMS for the various resources. A registered water use, however, does not guarantee that the water use is accurate or lawful. Validation and verification of the accuracy and lawfulness of the water use is needed to qualify as an Existing Lawful Use. Theewaterskloof Municipality is currently busy with Groundwater Water Use Authorisation Applications for their groundwater resources. **It is, however, important for the municipality to also confirm the correct registration volumes and existing lawful use volumes for their surface water sources for the different schemes. This information, with the safe yields of the surface and groundwater sources, is critical to accurately determine which sources need to be augmented for the different schemes. Theewaterskloof Municipality further needs to continue to ensure that all the individual sources are metered and that the abstraction volumes are recorded on at least a monthly basis.**

Water Quality: The operational water sampling programmes of Theewaterskloof Municipality needs to comply with the minimum requirement specified in SANS 241:2015 for characterising raw water quality, on-going levels of operational efficiency in a water treatment system and acceptable final water quality to the point of delivery.

Table C.6.5: Minimum Monitoring Frequency for Process Risk Indicators (SANS241-2:2015: Table 1)			
Determinand	**Raw Water**	**Final Water**	**Distribution System**
Conductivity or total dissolved solids	Daily	Daily	Not applicable
pH value	Daily	Once per shift [a]	Fortnightly
Turbidity	Daily	Once per shift [a]	Fortnightly
Disinfectant residuals	Not applicable	Once per shift [a]	Fortnightly
E.Coli (or faecal coliforms) [b]	Not applicable	Weekly	Fortnightly but dependent on population served [d]
Heterotrophic plate count [c]	Not applicable	Weekly	Fortnightly
Treatment chemicals [d]	Not applicable	Monthly	Not applicable

a: A shift is defined as an eight-hour work period.

b: If non-compliant with the numerical limits specified in SANS 241-1, implement corrective action and immediate follow-up sampling at an increased sampling frequency.

c: If non-compliant with the numerical limits specified in SANS 241-1, implement corrective action and follow-up sampling.

d: Includes all risk determinands that are added or formed as a result of the use of treatment chemicals (for example aluminium, iron and chlorine). If non-compliant with the numerical limits specified in SANS 241-1 in the final water, the distribution system monitoring frequencies of Table 3 in SANS241-2:2015 apply.

Operational and Compliance Water Quality Monitoring Programmes are implemented by Theewaterskloof Municipality. The current and proposed operational and compliance water quality sampling programmes of Theewaterskloof Municipality for the various water distribution systems are summarised in the table below.

Table C.6.6: Current and proposed water quality parameters to be sampled by the Theewaterskloof Municipality: Routine monitoring of Process Indicators				
Current / Proposed	**Sampling point**	**Frequency of sampling**	**Samples taken by**	**Current Parameters Sampled**
Bot River				
Current	Raw Water: One production bh	Daily	PC	pH, Colour, Turbidity
	Raw Water: Each production bh.	Monthly	External Lab	Conductivity, Turbidity, pH, Colour, Aluminium, Manganese, Iron, E.Coli, Total Coliform Bacteria, Free Chlorine, Total Chlorine, Monochloramine, TDS.
	Raw Water	Annually	External Lab	Full SANS241-2015 all determinands

Table C.6.6: Current and proposed water quality parameters to be sampled by the Theewaterskloof Municipality: Routine monitoring of Process Indicators				
Current / Proposed	**Sampling point**	**Frequency of sampling**	**Samples taken by**	**Current Parameters Sampled**
	Final Water: WTW	Daily	PC	pH, Colour, Turbidity, Free Chlorine, Total Chlorine
		Monthly	External Lab	Conductivity, pH, Turbidity, Colour, E.Coli, Free Chlorine, HPC, Total Alkalinity, Calcium, Calcium Hardness
		Annually	External Lab	Full SANS241-2015 all determinands
	Distribution System	Monthly	External Lab	Conductivity, pH, Turbidity, Colour, E.Coli, Free Chlorine, HPC, Total Alkalinity, Calcium, Calcium Hardness
		Annually	External Lab	Full SANS241-2015 all determinands
Proposed	Raw Water: One production bh	Daily	PC	As currently done, but Conductivity also to be taken
	Raw Water: Each production bh.	Monthly	External Lab	As currently done
	Raw Water	Annually	External Lab	As currently done
	Final Water	Daily	PC	As currently done, but Conductivity also to be taken
		Weekly	PC	E.Coli and HPC
		Monthly	External Lab	As currently done
		Annually	External Lab	As currently done
	Distribution System	14 Days	PC	pH, Turbidity, Residual Chlorine, E.Coli and HPC
		Monthly	External Lab	As currently done
		Annually	External Lab	As currently done
Caledon				
Current	Caledon Ext 12 bh	Monthly	External Lab	Conductivity, Turbidity, pH, Colour, Aluminium, Manganese, Iron, E.Coli, Total Coliforms, Free Chlorine, Total Chlorine, Monochloramine, TDS.
	Baronsbos bh	Monthly	External Lab	Conductivity, Turbidity, pH, Colour, Aluminium, Manganese, Iron, E.Coli, Total Coliforms, Free Chlorine, Total Chlorine, Monochloramine, TDS.
	Basil Newmark Dam	Monthly	External Lab	pH, Conductivity, Turbidity, Colour, Aluminium, Total Alkalinity, Calcium, Calcium Hardness, Sodium
	Raw Water	Annually	External Lab	Full SANS241-2015 all determinands
	Final Water: Package WTW	Monthly	External Lab	Conductivity, pH, Turbidity, Colour, Aluminium, E.Coli, Free Chlorine, HPC, Total Alkalinity, Calcium, Calcium Hardness, Sodium
		Annually	External Lab	Full SANS241-2015 all determinands
	Distribution System	Monthly	External Lab	Conductivity, pH, Turbidity, Colour, Aluminium, E.Coli, Free Chlorine, HPC, Total Alkalinity, Calcium, Calcium Hardness, Sodium
		Annually	External Lab	Full SANS241-2015 all determinands
Proposed	Caledon Ext 12 bh	Monthly	External Lab	As currently done
	Baronsbos bh	Monthly	External Lab	As currently done
	Basil Newmark Dam	Monthly	External Lab	As currently done
	Raw Water	Annually	External Lab	As currently done
	Raw Water: Package WTW	Daily	PC	Conductivity, pH, Turbidity
	Final Water: Package WTW	Daily	PC	Conductivity, pH, Turbidity, Residual Chlorine
		Weekly	PC	E.Coli and HPC
		Monthly	External Lab	As currently done
		Annually	External Lab	As currently done
	Distribution System	14 Days	PC	pH, Turbidity, Residual Chlorine, E.Coli and HPC
		Monthly	External Lab	As currently done
		Annually	External Lab	As currently done
Greyton and Boschmanskloof				
Current	Raw Water: Weir	Monthly	External Lab	pH, Conductivity, Turbidity, Colour, Aluminium, Iron, Chloride, Total Alkalinity, Calcium, Calcium Hardness, Manganese

Table C.6.6: Current and proposed water quality parameters to be sampled by the Theewaterskloof Municipality: Routine monitoring of Process Indicators				
Current / Proposed	**Sampling point**	**Frequency of sampling**	**Samples taken by**	**Current Parameters Sampled**
	Raw Water: Boschmanskloof Weir	Monthly	External Lab	pH, Conductivity, Turbidity, Colour, Aluminium, Iron, Chloride, Total Alkalinity, Calcium, Calcium Hardness, Manganese
	Raw Water: Borehole	Monthly	External Lab	pH, Turbidity, Conductivity, Colour, Aluminium, Iron, Manganese, E.Coli, Free Chlorine, HPC, Chloride, Sodium, Total Alkalinity, Calcium, Calcium Hardness
	Raw Water: Weir	Annually	External Lab	Full SANS241-2015 all determinands
	Final Water: Package WTW	Monthly	External Lab	Conductivity, pH, Turbidity, Colour, Aluminium, Iron, Manganese, E.Coli, Free Chlorine, HPC, Total Alkalinity, Calcium, Calcium Hardness, Chloride
		Annually	External Lab	Full SANS241-2015 all determinands
	Distribution System	Monthly	External Lab	Conductivity, pH, Turbidity, Colour, Aluminium, Iron, Manganese, E.Coli, Free Chlorine, HPC, Total Alkalinity, Calcium, Calcium Hardness, Chloride
Proposed Greyton and Boschmans-kloof	Raw Water: Weir	Monthly	External Lab	As currently done
	Raw Water: Boschmanskloof Weir	Monthly	External Lab	As currently done
	Raw Water: Borehole	Monthly	External Lab	As currently done
	Raw Water: Weir	Annually	External Lab	As currently done
	Raw Water: Package WTW	Daily	PC	Conductivity, pH, Turbidity
	Final Water: Package WTW	Daily	PC	Conductivity, pH, Turbidity, Residual Chlorine
		Weekly	PC	E.Coli and HPC
		Monthly	External Lab	As currently done
		Annually	External Lab	As currently done
	Distribution System	14 Days	PC	pH, Turbidity, Residual Chlorine, E.Coli and HPC
		Monthly	External Lab	As currently done
		Annually	External Lab	As currently done
Genadendal				
Current	Raw Water	Monthly	External Lab	pH, Conductivity, Turbidity, Colour, Aluminium, Iron, Chloride, Total Alkalinity, Calcium, Calcium Hardness, Manganese
		Annually	External Lab	Full SANS241-2015 all determinands
	Final Water: WTW	Monthly	External Lab	Conductivity, pH, Turbidity, Colour, Aluminium, Iron, Manganese, E.Coli, Free Chlorine, HPC, Total Alkalinity, Calcium, Calcium Hardness, Chloride
		Annually	External Lab	Full SANS241-2015 all determinands
	Distribution System	Monthly	External Lab	Conductivity, pH, Turbidity, Colour, Aluminium, Iron, Manganese, E.Coli, Free Chlorine, HPC, Total Alkalinity, Calcium, Calcium Hardness, Chloride
Proposed	Raw Water	Daily	PC	Conductivity, pH, Turbidity
		Monthly	External Lab	As currently done
		Annually	External Lab	As currently done
	Final Water: WTW	Daily	PC	pH, Turbidity, Conductivity, Residual Chlorine
		Weekly	PC	E.Coli and HPC
		Monthly	External Lab	As currently done
		Annually	External Lab	As currently done
	Distribution System	14 Days	PC	pH, Turbidity, Residual Chlorine, E.Coli and HPC
		Monthly	External Lab	As currently done
		Annually	External Lab	All SANS241-2015 determinands to be sampled for one point in network
Voorstekraal				
Current	Raw Water: Weir	Monthly	External Lab	pH, Conductivity, Turbidity, Colour, Aluminium, Iron, Chloride, Total Alkalinity, Calcium, Calcium Hardness, Manganese, Sodium

Table C.6.6: Current and proposed water quality parameters to be sampled by the Theewaterskloof Municipality: Routine monitoring of Process Indicators				
Current / Proposed	**Sampling point**	**Frequency of sampling**	**Samples taken by**	**Current Parameters Sampled**
	Raw Water: Borehole	Monthly	External Lab	pH, Turbidity, Conductivity, Colour, Aluminium, Iron, Manganese, E.Coli, Total Coliforms, Free Chlorine, Total Chlorine, Monochloramine, TDS
	Raw Water: Weir	Annually	External Lab	Full SANS241-2015 all determinands
	Final Water: Package WTW	Monthly	External Lab	Conductivity, pH, Turbidity, Colour, Aluminium, Iron, Manganese, E.Coli, Free Chlorine, HPC, Total Alkalinity, Calcium, Calcium Hardness, Chloride
		Annually	External Lab	Full SANS241-2015 all determinands
	Distribution System	Monthly	External Lab	Conductivity, pH, Turbidity, Colour, Aluminium, Iron, Manganese, E.Coli, Free Chlorine, HPC, Total Alkalinity, Calcium, Calcium Hardness, Chloride
Proposed	Raw Water: Weir	Monthly	External Lab	As currently done
	Raw Water: Borehole	Monthly	External Lab	As currently done
	Raw Water: Weir	Annually	External Lab	As currently done
	Raw Water: Package WTW	Daily	PC	Conductivity, pH, Turbidity
	Final Water: WTW	Daily	PC	Conductivity, pH, Turbidity, Residual Chlorine
		Weekly	PC	E.Coli and HPC
		Monthly	External Lab	As currently done
		Annually	External Lab	As currently done
	Distribution System	14 Days	PC	pH, Turbidity, Residual Chlorine, E.Coli and HPC
		Monthly	External Lab	As currently done
		Annually	External Lab	All SANS241-2015 determinands to be sampled for one point in network
Bereaville				
Current	Raw Water: Weir	Monthly	External Lab	pH, Conductivity, Turbidity, Colour, Aluminium, Iron, Chloride, Total Alkalinity, Calcium, Calcium Hardness, Manganese
	Raw Water: Borehole	Monthly	External Lab	pH, Turbidity, Conductivity, Colour, Aluminium, Iron, Manganese, E.Coli, Total Coliforms, Free Chlorine, Total Chlorine, Monochloramine, TDS
	Raw Water: Weir	Annually	External Lab	Full SANS241-2015 all determinands
	Final Water: Package WTW	Monthly	External Lab	Conductivity, pH, Turbidity, Colour, Aluminium, Iron, Manganese, E.Coli, Free Chlorine, HPC, Total Alkalinity, Calcium, Calcium Hardness, Chloride
		Annually	External Lab	Full SANS241-2015 all determinands
	Distribution System	Monthly	External Lab	Conductivity, pH, Turbidity, Colour, Aluminium, Iron, Manganese, E.Coli, Free Chlorine, HPC, Total Alkalinity, Calcium, Calcium Hardness, Chloride
Proposed	Raw Water: Weir	Monthly	External Lab	As currently done
	Raw Water: Borehole	Monthly	External Lab	As currently done
	Raw Water: Weir	Annually	External Lab	As currently done
	Raw Water: Package WTW	Daily	PC	Conductivity, pH, Turbidity
	Final Water: WTW	Daily	PC	Conductivity, pH, Turbidity, Residual Chlorine
		Weekly	PC	E.Coli and HPC
		Monthly	External Lab	As currently done
		Annually	External Lab	As currently done
	Distribution System	14 Days	PC	pH, Turbidity, Residual Chlorine, E.Coli and HPC
		Monthly	External Lab	As currently done
		Annually	External Lab	All SANS241-2015 determinands to be sampled for one point in network
Grabouw				
Current	WTW: Raw Water	Hourly	PC	pH

Table C.6.6: Current and proposed water quality parameters to be sampled by the Theewaterskloof Municipality: Routine monitoring of Process Indicators				
Current / Proposed	**Sampling point**	**Frequency of sampling**	**Samples taken by**	**Current Parameters Sampled**
		Two Hourly	PC	pH, Colour, Turbidity
		Monthly	External Lab	pH, Turbidity, Conductivity, Colour, Aluminium, Iron, Chloride, Total Alkalinity, Calcium, Calcium Hardness
		Annually	External Lab	Full SANS241-2015 all determinands
	WTW: In-settling	Two Hourly	PC	pH, Colour, Turbidity
	WTW: After-settling	Two Hourly	PC	pH, Colour, Turbidity, Sodium, Aluminium
	WTW: Filtered	Two Hourly	PC	pH, Colour, Turbidity
	WTW: Final Water	Hourly	PC	pH
		Two Hourly	PC	pH, Colour, Turbidity, Free Chlorine
		Monthly	External Lab	Conductivity, pH, Turbidity, Colour, Aluminium, Iron, Manganese, E.Coli, Free Chlorine, HPC, Total Alkalinity, Calcium, Calcium Hardness, Chloride
		Quarterly	External Lab	TDS, Manganese, Total Coliforms, Total Chlorine, Total Hardness, Magnesium Hardness, Magnesium, Sodium, Potassium, Zinc, Fluoride, Sulphate, Ammonia, Nitrite, Nitrate, Nitrate & Nitrite,
		Annually	External Lab	Full SANS241-2015 all determinands
	Distribution System	Monthly	External Lab	Conductivity, pH, Turbidity, Colour, Aluminium, Iron, Manganese, E.Coli, Free Chlorine, HPC, Total Alkalinity, Calcium, Calcium Hardness, Chloride
		Annually	External Lab	Full SANS241-2015 all determinands
Proposed	Raw Water	Hourly	PC	As currently done
		Two Hourly	PC	As currently done
		Daily	PC	Conductivity to be sampled
		Monthly	External Lab	As currently done
		Annually	External Lab	As currently done
	WTW: In-settling	Two Hourly	PC	As currently done
	WTW: After-settling	Two Hourly	PC	As currently done
	WTW: Filtered	Two Hourly	PC	As currently done
	Final Water: WTW	Hourly	PC	As currently done
		Two Hourly	PC	As currently done
		Daily	PC	Conductivity to be sampled
		Weekly	PC	E.Coli and HPC
		Monthly	External Lab	As currently done
		Quarterly	External Lab	As currently done
		Annually	External Lab	As currently done
	Distribution System	14 Days	PC	pH, Turbidity, Residual Chlorine, E.Coli and HPC
		Monthly	External Lab	As currently done
		Annually	External Lab	As currently done
Riviersonderend				
Current	Raw Water: Borehole	Monthly	External Lab	pH, Turbidity, Conductivity, Colour, Aluminium, Iron, Manganese, E.Coli, Total Coliforms, Free Chlorine, Total Chlorine, Monochloramine, TDS
	Raw Water Weir	Monthly	External Lab	pH, Turbidity, Conductivity, Colour, Aluminium, Iron, Chloride, Total Alkalinity, Calcium, Calcium Hardness
		Annually	External Lab	Full SANS241-2015 all determinands
	WTW: Final Water	Monthly	External Lab	Conductivity, pH, Turbidity, Colour, Aluminium, Iron, E.Coli, Free Chlorine, HPC, Total Alkalinity, Calcium, Calcium Hardness, Chloride
		Annually	External Lab	Full SANS241-2015 all determinands
	Distribution System	Monthly	External Lab	Conductivity, pH, Turbidity, Colour, Aluminium, Iron, E.Coli, Free Chlorine, HPC, Total Alkalinity, Calcium, Calcium Hardness, Chloride

Table C.6.6: Current and proposed water quality parameters to be sampled by the Theewaterskloof Municipality: Routine monitoring of Process Indicators				
Current / Proposed	**Sampling point**	**Frequency of sampling**	**Samples taken by**	**Current Parameters Sampled**
		Annually	External Lab	Full SANS241-2015 all determinands
Proposed	Raw Water: Borehole	Monthly	External Lab	As currently done
	Raw Water Weir	Monthly	External Lab	As currently done
		Annually	External Lab	As currently done
	WTW: Raw Water	Daily	PC	Conductivity, pH, Turbidity
	WTW: Final Water	Daily	PC	Conductivity, pH, Turbidity, Residual Chlorine
		Weekly	PC	E.Coli and HPC
		Monthly	External Lab	As currently done
		Annually	External Lab	As currently done
	Distribution System	14 Days	PC	pH, Turbidity, Residual Chlorine, E.Coli and HPC
		Monthly	External Lab	As currently done
		Quarterly	External Lab	As currently done
Tesselaarsdal				
Current	Raw Water: Borehole	Monthly	External Lab	pH, Turbidity, Conductivity, Colour, Aluminium, Iron, Manganese, E.Coli, Total Coliforms, Free Chlorine, Total Chlorine, Monochloramine, TDS.
	Raw Water	Monthly	External Lab	pH, Turbidity, Conductivity, Colour, Chloride, Total Alkalinity, Calcium, Calcium Hardness
		Annually	External Lab	Full SANS241-2015 all determinands
	WTW: Final Water	Monthly	External Lab	Conductivity, pH, Turbidity, Colour, E.Coli, Free Chlorine, HPC, Total Alkalinity, Calcium, Calcium Hardness, Chloride
		Annually	External Lab	Full SANS241-2015 all determinands
	Distribution System	Monthly	External Lab	Conductivity, pH, Turbidity, Colour, E.Coli, Free Chlorine, HPC, Total Alkalinity, Calcium, Calcium Hardness, Chloride
		Annually	External Lab	Full SANS241-2015 all determinands
Proposed	Raw Water: Borehole	Monthly	External Lab	As currently done
	Raw Water	Daily	PC	Conductivity, pH, Turbidity
		Monthly	External Lab	As currently done
		Annually	External Lab	As currently done
	WTW: Final Water	Daily	PC	Conductivity, pH, Turbidity, Residual Chlorine
		Weekly	PC	E.Coli and HPC
		Monthly	External Lab	As currently done
		Annually	External Lab	As currently done
	Distribution System	14 Days	PC	pH, Turbidity, Residual Chlorine, E.Coli and HPC
		Monthly	External Lab	As currently done
		Annually	External Lab	As currently done
Villiersdorp				
Current	Raw Water	Daily	PC	pH
	Raw Water: Canal	Monthly	External Lab	pH, Conductivity, Turbidity, Colour, Iron, Total Alkalinity, Calcium, Calcium Hardness
	Raw Water: Weir	Annually	External Lab	Full SANS241-2015 all determinands
	WTW: Final Water	Daily	PC	pH, Turbidity, Colour, Free Chlorine
		Monthly	External Lab	Conductivity, pH, Turbidity, Colour, Iron, E.Coli, Free Chlorine, HPC, Total Alkalinity, Calcium, Calcium Hardness
		Annually	External Lab	Full SANS241-2015 all determinands
	Distribution System	Monthly	External Lab	Conductivity, pH, Turbidity, Colour, Iron, E.Coli, Free Chlorine, HPC, Total Alkalinity, Calcium, Calcium Hardness
		Annually	External Lab	Full SANS241-2015 all determinands
Proposed	Raw Water	Daily	PC	Conductivity, pH, Turbidity
	Raw Water: Canal	Monthly	External Lab	As currently done
	Raw Water: Weir	Annually	External Lab	As currently done

Table C.6.6: Current and proposed water quality parameters to be sampled by the Theewaterskloof Municipality: Routine monitoring of Process Indicators				
Current / Proposed	**Sampling point**	**Frequency of sampling**	**Samples taken by**	**Current Parameters Sampled**
	WTW: Final Water	Daily	PC	As currently done, but Conductivity also to be taken
		Weekly	PC	E.Coli and HPC
		Monthly	External Lab	As currently done
		Annually	External Lab	As currently done
	Distribution System	14 Days	PC	pH, Turbidity, Residual Chlorine, E.Coli and HPC
		Monthly	External Lab	As currently done
		Annually	External Lab	As currently done

Effluent Quality: The logbooks at the various WWTWs, as noted during the site inspections for the WSDP, allow for the following operational sampling parameters to be recorded.

Table C.6.7 Operational sampling programme for the WWTWs			
WWTW	**Position**	**Frequency**	**Determinand**
Bot River	Reactor	Twice Daily	SVI
	Final Effluent	Twice Daily	pH, Free Chlorine
Caledon	Reactor	Twice Daily	pH (Mixed Liquor), SVI
	Final Effluent	Twice Daily	pH (Final Water)
Genadendal	-	-	-
Grabouw	Reactor	Twice Daily	pH (Mixed Liquor), SVI
	Final Effluent	Twice Daily	pH, Free Chlorine
		Bi Weekly	COD, Nitrate, Orthophosphate, Ammonia, DO
Greyton	Reactor	Daily	SVI
	Final Effluent	Daily	Free Chlorine
Riviersonderend	-	-	-
Tesselaarsdal	Reactor	Daily	MLSS
Villiersdorp	Final Effluent	Twice Daily	pH, Electrical Conductivity, Free Chlorine

The table below gives an overview of the monthly parameters tested at the various WWTWs and the place where the samples are taken.

Table C.6.8: Monthly effluent quality parameters monitored for operational and compliance monitoring								
Parameter	**Grabouw, Bot River, Caledon, Genadendal, Greyton, Villiersdorp, Tesselaarsdal**				**Riviersonderend**			
	Raw Sewage	**Aeration Tank**	**Settling Tank**	**Final Effluent**	**Raw Sewage**	**Pond 1**	**Final Effluent**	**FE Pond**
pH (at 25°C)(Field)	X	X	X	X	X	X	X	X
Settleable Solids (ml/l)	X	X	X	-	X	-	-	X
Conductivity (at 25°C)(mS/m)	X	-	X	X	X	-	X	X
E.Coli / Faecal Coliforms (org./100ml)	-	-	-	X	-	-	X	X
Sodium Absorption Ratio	-	-	-	-	-	-	-	X
	mg/l	**mg/l**	**mg/l**	**mg/l**	**mg/l**	**mg/l**	**mg/l**	**mg/l**
Chemical Oxygen Demand	X	-	X	X	X	X	X	X
Chemical Oxygen Demand (Filtered)	-	X	-	X	-	-	X	X
Total Kjeldahl Nitrogen	X	-	-	-	X	-	-	-
Ammonia Nitrogen	X	X	X	X	X	X	X	X
Nitrate Nitrogen	-	X	-	X	-	X	X	X
Nitrite Nitrogen	-	X	-	X	-	X	X	X
Total Suspended Solids	-	-	-	X	-	X	X	X
Total Phosphate (as P)	X	-	-	-	X	-	-	
Ortho Phosphate (as P)	-	-	-	X	-	-	X	X
Oil and Grease	-	-	-	-	-	-	X	X
Free Chlorine	-	-	-	X	-	-	X	X

Table C.6.8: Monthly effluent quality parameters monitored for operational and compliance monitoring								
Parameter	Grabouw, Bot River, Caledon, Genadendal, Greyton, Villiersdorp, Tesselaarsdal				Riviersonderend			
	Raw Sewage	Aeration Tank	Settling Tank	Final Effluent	Raw Sewage	Pond 1	Final Effluent	FE Pond
Total Chlorine	-	-	-	X	-	-	-	X
Dissolved Oxygen	-	X	X	-	-	X	-	-
Calcium (as Ca)	-	-	-	-	-	-	-	X
Magnesium (as Mg)	-	-	-	-	-	-	-	X
Sodium (as Na)	-	-	-	-	-	-	-	X
Total Alkalinity	X	-	X	-	X	-	-	X
Monochloramine	-	-	-	-	-	-	-	X
Fluoride (as F)	-	-	-	-	-	-	-	X

The pH, Conductivity, Faecal Coliforms, COD, COD (Filtered), Ammonia Nitrogen, Nitrate, Nitrogen, Nitrite Nitrogen, Total Suspended Solids, Orthophosphate, Free Chlorine, Total Chlorine and Total Alkalinity are also tested on a monthly basis up-stream and down-stream of the WWTW in Caledon.

The Compliance Monitoring Programme consists of monthly sampling of final effluents at the various WWTWs and analyses of all the main quality criteria, as indicated in Table C.6.8 above. Results of the samples taken are loaded onto DWS's IRIS. Monthly monitoring and inspection reports are also compiled by an external Laboratory for all the WWTWs. The Municipality takes immediate action to rectify problems and / or improve operational aspects as and when may be required. For serious failures an Incident Response Management Protocol is followed to ensure rapid remedying of the problems, which includes notification to the DWS as may be necessary.

The Municipality's existing Operational Sampling Programme is not adequate to ensure optimal operation of the various WWTWs and the following operational sampling points are recommended for the various WWTWs.

Table C.6.9: Recommended operational sampling points for the various WWTWs					
Sampling Point	Type of sampling (Grab / Composite)	Sample bottle volume and type (Glass / Plastic)	Frequency of sampling	Analyses performed on the samples	Monitoring
Activated Sludge Systems					
Raw sewage	Grab	Plastic	Daily	pH, Settleable Solids, EC	Operational
Bioreactor	Grab	Plastic	Daily	Dissolved Oxygen, VSC, pH	Operational
Final effluent	Grab	Plastic	Daily	pH, Free Chlorine	Operational
Oxidation Pond Systems					
Raw sewage	Grab	1L Plastic	Daily	pH, Settling Solids, EC	Operational

Note: VSC = volumetric sludge concentration (30-minute test in 1 litre measuring cylinder)

DO level in the aerobic basin is a simple but important parameter that should be monitored. Monitoring DO can be done with handheld devices which are simple to use and cost effective. Additionally the solids concentration should be checked to ensure that the sludge content is sufficient. Sampling the reactor content for laboratory analysis is best but the SVI test can also be very helpful.

The current Operational Alert Levels should be checked regularly by the municipality in order to ensure that the various unit processes in the plant performs optimally. If these pre-determined Alert Levels are exceeded at any of the control points where samples are taken for operational purposes, then certain actions should be taken to bring the operational parameters back to within the target ranges.

The proposed Operational Alert Levels for the various WWTWs and the corresponding actions that should be taken when these levels are reached or exceeded are included in the table below.

Table C.6.10: Recommended Operational Alert Levels for the various WWTWs		
Operational Samples	**Alert Level**	**Actions to be taken**
Activated Sludge Systems (Recommended)		
Raw Sewage	COD > 1 000 mg/L Ammonia > 100 mg/L as N 5.5 > pH > 9.5 EC > 150 mS/m Settling Solids > 20 mL/L	• Check for possible illegal industrial effluent discharge. • Do more frequent measurements of DO levels, pH and MLSS in the activated sludge reactor.
At outlet of bioreactor	DO < 0.5 mg/L	• Increase aeration capacity or cycles.
	MLSS < 2 000 mg/L	• Reduce discharge of WAS and allow MLSS levels to increase to 4 000 mg/L.
	MLSS > 6 000 mg/L	• Gradually waste more sludge on a daily basis to reduce the MLSS to 4 000 mg/L.
	pH < 7.0	• Add lime to the inlet works to maintain the pH in the reactor at 7.0 or slightly above. • Check denitrification process.
Secondary settling tank	COD > 75 mg/L	• Check for sludge carry over from secondary settling tanks. • Check RAS recycle rates. • Check for bulking sludge. • Check for rising sludge. **Take action to rectify as appropriate**
Oxidation Pond Systems (Recommended)		
Raw Sewage	COD > 1 000 mg/L Ammonia > 100 mg/L as N 5.5 > pH > 9.5 EC > 150 mS/m Settling Solids > 20 mL/L	• Check for possible illegal industrial effluent discharge.
Tertiary Pond	COD > 400 mg/L Ammonia > 100 mg/L as N 6 > pH > 9 EC > 200 mS/m SAR > 5 Faecal Coliforms > 100 000 per 100ml	• Aerate ponds or provide additional ponds for a total retention period of 25 days.

The DWS also followed a risk-based regulatory approach that provides early warning signs of WWTWs that contain a certain measure of risk, and in directing the type of intervention required to manage and mitigate the identified risk and move to a more favourable position of compliance and ultimately, excellence. The current Cumulative Risk Ratios (CRR = A*B+C+D) of the WWTWs in Theewaterskloof Municipality's Management Area, as calculated by the DWS during 2011, 2013, 2022 and 2023, are indicated in the table below.

Table C.6.11: Cumulative Risk Ratio of the various WWTWs (% Deviation = Actual CRR / Max CRR)				
WWTW	**2011**	**2013**	**2022**	**2023**
Grabouw	64.7%	52.9%	54.5%	66.7%
Bot River	64.7%	35.3%	58.8%	35.3%
Villiersdorp	41.2%	52.9%	35.3%	58.8%
Caledon	76.5%	58.8%	58.8%	70.6%
Genadendal	41.2%	23.5%	58.8%	60.0%
Greyton	47.1%	88.2%	58.8%	60.0%
Riviersonderend	58.8%	35.3%	64.7%	73.3%
Tesselaarsdal	-	-	41.2%	58.3%

Note: Low < 50%, Medium 50% - < 70%, High 70% - < 90%, Critical 90% - 100%

Industrial Consumers: Theewaterskloof Municipality can promote WDM activities at the wet industrial consumers in order for them to potentially lower their current water demand by means of improved practices or reuse of waste water. The revenue could potentially decrease as a result of re-use practices. It is suggested that a detailed financial analysis should be conducted as part of the investigation into wastewater re-use.

Theewaterskloof Municipality can encourage the large users to implement suggested re-use practices by means of incentives, informative billing to communicate monthly water consumption and monitoring and communicating actual savings achieved.

Not all industrial consumers that discharge industrial effluent into the Municipality's sewer system is currently monitored with regard to the quantity and quality. The quality and volume of industrial effluent discharged into the sewer system need to be monitored by the Municipality, in order to determine whether the quality comply with the standards and criteria. It is also necessary to consider limits above which volumetric monitoring will be necessary at new industries and existing smaller industries, where expansion is likely to take place. The Municipality needs to ensure that all industrial consumers apply for discharge permits and they must supply and maintain a flow meter measuring the volume of water that is discharged into the sewer system. It is also recommended that the accounts generated by the Municipality include for each cycle a summary of the COD and flow results to enable industries to keep a record and look at ways of improving where possible.

Theewaterskloof Municipality is committed to ensure that no industrial effluent is discharged into the sewer system unless it complies with the required standards and criteria.

TOPIC 7: FINANCIAL

The main challenges experienced during the compilation of the 2025/26 MTREF were summarised as follows in the Theewaterskloof Municipality's 2025/2026 Final Budget of 29 May 2025.

- The increased costs associated with bulk electricity, placing upward pressure on tariff increases to consumers. Continued high tariff increases may soon render municipal services financially unaffordable and impact negatively on revenue collection targets;
- Reprioritisation of capital projects and operating expenditure within the financial affordability limits of the Budget, taking cash position into account;
- Salary increases for municipal staff salary requirement to fill funded vacant, critical and essential positions in accordance with the Salary and Wage Collective Agreement;
- National and local economic difficulties (low economic growth);
- Above inflation increases in essential maintenance costs;
- Old infrastructure which needs to be consistently maintained or replaced; and
- Reduced consumption of water and electricity in response to water restrictions and load shedding.

The following problem areas are key factors to be addressed to ensure that the municipality is financially viable (2025/2026 Final Budget of 29 May 2025).

- Subsidisation of rates funded services from trading services;
- No contribution to a capital replacement reserve fund;
- Productivity and cost cutting measures;
- Ageing infrastructure and inadequate provision for repairs and maintenance;
- Out-dated fiscal model and limited grant funding for the benefit of indigent communities only;
- Institutional capacity and development sustainability;
- Uncontrolled influx of Indigent People;
- Narrow Revenue Base of the municipality;
- Lack of accurate data required for Longer Term Financial Planning; and
- Unfunded / Underfunded Mandates.

Government continues to invest in improving the financial capability of municipalities. National and Provincial Treasuries have agreed to focus their efforts on the following four "game changers" in the period ahead:

- The new Municipal Standard Chart of Accounts, which was implemented from 1 July 2017, contributing to greater transparency and consistency of municipal finances.
- Targeted supply chain management interventions to achieve cost savings and combat fraud.
- Enhanced revenue management, including appropriate tariff-setting, regular billing and effective collection systems.
- Improved asset management, including adherence to 8% of the value of assets being spent on their maintenance.

The following key areas have the highest potential to impact on the long-term financial sustainability of TWK Municipality (2025/2026 IDP):

- A disproportionate growth in the number of low-income earning individuals is experienced and is expected to continue;
- The ability of the municipality to deliver services like shelter/housing, water, sanitation, refuse removal and to establish a sustainable environment for people to live in peace, harmony and dignity is constrained by the growing service delivery demand, ageing infrastructure and adequate bulk service capacity needed;
- Revenue available for development is under strain due to a combination of factors;
- In the face of sluggish and variable National and Provincial economic growth and job creation, identifying and extending Theewaterskloof Municipality's local economic competitive advantage is key;
- It is essential to foster a long-term developmental partnership between Theewaterskloof Municipality, business and specifically the agriculture sub-economic sector. This relationship, which is strained from time to time due to the sector's belief of an unequitable contribution to rates and taxes, is very important for the sustainability of Theewaterskloof;
- Lastly, change brings with it uncertainty, and the introduction of the new organigram is still to deliver on its intended efficiency gains and optimisation and to support the municipality in achieving the principles as reflected in the IDP Review 2018/19.

The Municipality has an approved Long-term Financial Plan in place, with the following objectives.

- To recommend strategies and policies that will maximise the probability of the municipality's financial sustainability into the future. This is achieved by predicting future cash flows and affordable capital expenditure based on the municipality's historic performance and the environment in which it operates.
- A secondary objective of this plan is to quantify the potential capital and borrowing programmes that the municipality can follow to accelerate infrastructure delivery, whilst ensuring that its financial sustainability is maintained into the future.
- The plan provides guidelines, within the context of an uncertain future, of what the municipality can afford. The plan does not prescribe what the municipality should implement.

Expenditure: The matter of financial sustainability remains critical as the municipality receives less funding from grant funded areas from national government. Due to the stagnated national economy the municipality should plan for less income from national government and to escalate its own income through holistic local growth and development. This reality instigated the new focus on institutional, community and local economic growth and development and the establishment of partnerships with stakeholders.

Operational: The future planned expenditure by type for Theewaterskloof Municipality, as included in the 2025/2026 Budget, is indicated in the table below.

Table C.7.1: Expenditure items by type, as included in the 2025/2026 Budget

Expenditure Items	% of total 2023/2024 Expenditure	2023/2024 Audited Outcome	2024/2025 Pre-Audit Outcome	2025/2026 Budget	2026/2027 Budget	2027/2028 Budget
Employee related costs	30.69%	R275 385 000	R283 125 000	R315 821 000	R330 034 000	R338 284 000
Remuneration of Councillors	1.47%	R13 189 000	R14 356 000	R15 017 000	R15 693 000	R16 085 000
Bulk Purchases	11.26%	R101 021 000	R125 718 000	R139 207 000	R145 471 000	R149 108 000
Inventory Consumed	4.50%	R40 327 000	R46 517 000	R41 790 000	R43 670 000	R44 762 000
Debt Impairment	9.90%	R88 788 000	R114 067 000	R116 591 000	R121 838 000	R124 884 000
Depreciation and Amortisation	3.81%	R34 188 000	R35 691 000	R35 541 000	R35 541 000	R35 511 000
Interest	4.65%	R41 699 000	R49 933 000	R47 551 000	R49 690 000	R50 933 000
Contracted Services	15.82%	R141 907 000	R70 119 000	R60 429 000	R63 148 000	R64 727 000
Transfers and Grants	0.22%	R1 952 000	R8 017 000	R12 080 000	R0	R0
Irrecoverable debts written off	0.00%	R0	R0	R0	R0	R0
Operational costs	13.16%	R118 080 000	R88 709 000	R94 466 000	R98 717 000	R101 185 000
Losses on disposal of Assets	4.51%	R40 429 000	R1 564 000	R64 000	R67 000	R69 000
Other Losses	0.01%	R131 000	R5 646 000	R5 546 000	R5 796 000	R5 940 000
Total	100.0%	**R897 096 000**	**R843 462 000**	**R884 103 000**	**R909 664 000**	**R931 488 000**

Source: 2025/2026 Medium Term Revenue and Expenditure Framework for Theewaterskloof Municipality: Table A4 – Budgeted Financial Performance (Revenue and Expenditure)

Maintenance activities have been increasingly focused on reactive maintenance as a result of the progressive deterioration and failure of old infrastructure. Consequently, there has been dilution of preventative maintenance of other infrastructure. Expenditure on repairs and maintenance does not keep track with the increase in asset values as well as the ageing of the infrastructure.

An Integrated Maintenance Plan is necessary that optimises maintenance activities, appropriate to its specific needs and the local environment, and identifies the systems and resources required to support this. A regime of planned preventative maintenance should be established for all infrastructure assets classified as critical and important in the Asset Register. Consideration should be given to the establishment of a maintenance management system to enable Theewaterskloof Municipality to better manage its risks, and more effectively plan and prioritise the wave of renewals that are going to be required over the next 20 years.

It is important to note that the maintenance budget requirements are going to increase substantially over the next twenty years in real terms, in line with the envisaged pace of development, and the upgrading of the treatment works. It is estimated that the budget requirements will double over this period.

The recommendations for Theewaterskloof Municipality, with regard to their Operational Budgets, are as follows:

- Develop an AMP, which will indicate the real replacement values and service lives of the assets and the funds required to provide for adequate operation and maintenance of the infrastructure. Current gaps include unrealistically low depreciation charges, which have to be rectified and ring-fenced into an asset replacement fund, as well as additional budget requirements above inflation for infrastructure development.

- The new depreciation charges will have to form part of the operating budget and subsequent tariffs, linked to a ring-fenced asset replacement fund.

- It is critical for Theewaterskloof Municipality to ensure that sufficient funding is allocated towards an asset replacement fund, in order to ensure adequate rehabilitation and maintenance of the existing infrastructure.

- Water services operational surpluses have to be allocated to essential water services requirements in the future.

- Theewaterskloof Municipality needs to ensure that the Credit Control and Debt Collection By-laws are strictly enforced.

Capital: The future estimated capital expenditure per standard classification are summarised in the table below:

Table C.7.2: Estimated capital expenditure per standard classification of Theewaterskloof Municipality's future capital budget

Capital Expenditure Standard	2023/2024 Audited Outcome	2024/2025 Pre-Audit Outcome	2025/2026 Budget	2026/2027 Budget	2027/2028 Budget
Executive and Council	R0	R0	R0	R0	R0
Finance and administration	R3 618 000	R9 130 000	R6 874 000	R0	R0
Internal audit	R0	R0	R0	R0	R0
Community and Social Services	R2 112 000	R791 000	R0	R0	R0
Sport and recreation	R5 524 000	R2 513 000	R0	R0	R0
Public Safety	R360 000	R14 000	R0	R0	R0
Housing	R39 167 000	R124 942 000	R45 288 000	R108 020 000	R110 200 000
Planning and Development	R1 217 000	R2 000 000	R0	R0	R0
Road Transport	R7 048 000	R13 042 000	R0	R0	R0
Environmental Protection	R0	R0	R0	R0	R0
Energy sources	R17 861 000	R4 637 000	R0	R6 000 000	R6 271 000
Water	R29 024 000	R13 988 000	R12 281 000	R8 224 000	R24 088 000
Waste Water Management	R18 860 000	R9 113 000	R24 387 000	R29 464 000	R11 478 000
Waste Management	R1 376 000	R0	R0	R0	R0
Other	R0	R0	R0	R0	R0
Total Capital Expenditure	**R126 167 000**	**R180 170 000**	**R88 830 000**	**R151 708 000**	**R152 037 000**

Source: 2025/2026 Medium Term Revenue and Expenditure Framework for Theewaterskloof Municipality: Table A5 - Capital Expenditure by Vote, Standard Classification and Funding

National Treasury has recommended that municipalities should allocate at least 40% of their capital budget to the renewal of existing assets, and allocations to repairs and maintenance should be 8% of PPE. The 2025/2026 final capital budget allocation for renewal of existing assets amounts to 48.5% which is above the National treasury requirement. The recommendation on repairs and maintenance are met as the repairs and maintenance spends as a percentage of written down value of assets is 9.9%. The reasons for the compliance to this National Treasury guideline are due to the implementation of mSCOA where the repairs and maintenance is allocated to projects which include all components related to repairs and maintenance. Repairs and maintenance expenditure will also gradually increase to above the guideline levels of 8%. The spending should also be aligned with the municipality's maintenance plans with regard to affordability and other priorities (2025/2026 Final Budget of 29 May 2025).

The Opening Cost of the water and sewerage infrastructure that will need to be replaced over the next five years (RUL <5 yrs) is R52.295 million. The asset renewal needs for the **water infrastructure assets** over the next ten years is R5.995 million per year. The reinvestment required is R25.656 million in the first five years and R34.296 million in the second five-year period. The age of 13.18% of the water infrastructure assets is greater than twenty years. The asset renewal needs for the **sewerage infrastructure assets** over the next ten years is R4.807 million per year. The reinvestment required is R26.638 million in the first five years and R21.427 million in the second five-year period. The age of 7.77% of the sewerage infrastructure assets is greater than twenty years. These values are based on the Opening Cost of the water and sewerage infrastructure currently included in the Asset Register. Table C.4.2 however indicates the required annual budget for the replacement of the old water and sewerage infrastructure and the required annual O&M budget, which is based on the CRC of the water and sewerage infrastructure included in the WSDP.

The extent to which each type of water and sewerage asset portfolio has been consumed are summarised in Tables A.3.7 to A.3.12. The infrastructure components with low percentage figures (% Carrying Value/Opening Cost) need dedicated renewals programmes targeting these assets. If this is not done, there is the risk that the on-going deterioration will escalate to uncontrolled proportions, with considerable impact on consumers, the economy of the area and the service levels that can be provided in Theewaterskloof Municipality.

The recommendations for Theewaterskloof Municipality, with regard to their Capital Funding, are as follows:

- Take the recommended projects, as identified through the Water and Sewer Master Plans and the WSDP, into account during the planning and prioritization process for new infrastructure. Prioritize from the desired list, those items which can be implemented from available funding in the particular financial year.

- Undertake revised master planning at least every three to five years and to use the Master Plans to list the desired infrastructure development requirements and reflect these in the IDP.

- Assign a high priority to the implementation of the approved WDM Strategy in order to postpone additional capital investment for as long as possible, both from the water availability perspective as well as from the treatment of increased effluent volumes. The costs of physical water loss, the capital requirements for new water resources infrastructure, and the constraints of poor water availability on water dependent economic growth means that WC/WDM is a critical management priority for stretching the financial resources of the Municipality. WC/WDM is almost always a more cost-effective solution than the implementation of new infrastructure, and no new infrastructure should be developed until unauthorized water has been reduced to manageable volumes.

- To adopt appropriate technology solutions for the water and sewerage infrastructure challenges. Techniques such as value engineering should also be adopted to ensure that investments in infrastructure and other solutions are cost effective over the full life-cycle and designed to be fit for purpose.

- To ensure adequate funding for the full lifecycle cost of the new water and sewerage infrastructure, which will include funds for the operation and maintenance of the infrastructure and regular refurbishment.

- Balance land-use and development planning (SDFs) in accordance with the availability of water and the capacity of WTWs and WWTWs that are in place or that will be implemented.

- To focus strongly on revenue collection, in order to improve the Municipality's own funding sources, because most of the funds for the current water and sewerage capital projects come from the MIG. The Municipality also needs to actively implement their Credit Control and Debt Collection measures in order to minimize the percentage of non-payment of municipal services.

- To identify all possible sources of external funding over the next three years to assist Theewaterskloof Municipality to address the bulk infrastructure backlogs that exist in the various towns as indicated in the tables under Topic 3.

- Develop IAMPs for all water and sewerage infrastructure, which will indicate the real replacement values, the service life of the assets and the funds required to provide for adequate asset replacement. The renewals burden is set to increase sharply over the next 20 years and it is therefore important for Theewaterskloof Municipality to commit to a substantial and sustained programme of capital renewal works. The current level of expenditure on capital renewal is inadequate and there is a critical need for Council to commit to increase the budget for the maintenance and rehabilitation of the existing infrastructure substantially.

Income: Revenue Management: As part of the financial sustainability strategy, initiatives have been implemented to increase cash inflow such as demand management water and prepaid electricity meters for all. The intention of the strategy is to streamline the revenue value chain by ensuring accurate billing, customer service, and credit control and debt collection. Various other interventions are currently in process such as data cleansing, the restructuring of the revenue function and the task team for revenue management investigating the critical causes of a low collection rate which include systems, processes and data management.

Operational: The future planned revenue by source for Theewaterskloof Municipality, as included in the 2025/2026 MTEF Budget, is as follows:

Table C.7.3: Revenue items by source, as included in the 2025/2026 Budget

Revenue Item	2023/2024 Audited Outcome	2024/2025 Pre-Audit Outcome	2025/2026 Budget	2026/2027 Budget	2027/2028 Budget
Service Charges - Electricity	R131 842 000	R152 783 000	R170 079 000	R177 732 000	R182 176 000
Service Charges - Water	R88 007 000	R96 037 000	R103 720 000	R108 387 000	R111 097 000
Service Charges - Waste Water Management	R43 033 000	R52 506 000	R49 742 000	R51 980 000	R53 280 000
Service Charges – Waste Management	R42 459 000	R44 332 000	R46 549 000	R48 643 000	R49 859 000
Sale of Goods and Rendering of Services	R3 193 000	R14 790 000	R26 616 000	R27 814 000	R28 509 000
Agency Services	R7 938 000	R9 894 000	R8 417 000	R8 796 000	R9 016 000
Interest	R0	R0	R0	R0	R0
Interest earned from Receivables	R23 411 000	R25 985 000	R27 661 000	R28 906 000	R29 628 000
Interest earned from Current and Non-Current Assets	R6 151 000	R3 850 000	R6 169 000	R6 447 000	R6 608 000
Dividends	R0	R0	R0	R0	R0
Rent on Land	R0	R1 000	R0	R0	R0
Rental from Fixed Assets	R2 039 000	R1 716 000	R2 076 000	R2 169 000	R2 224 000
Licences and permits	R2 000	R25 000	R76 000	R79 000	R81 000
Operational Revenue	R19 492 000	R3 603 000	R4 055 000	R4 238 000	R4 344 000
Property Rates	R153 616 000	R161 124 000	R173 070 000	R180 859 000	R185 380 000
Surcharges and Taxes	R1 895 000	R1 897 000	R0	R0	R0
Fines, penalties and forfeits	R20 795 000	R29 870 000	R27 812 000	R27 871 000	R27 906 000
Licences or permits	R0	R0	R0	R0	R0
Transfers and subsidies - Operational	R153 872 000	R169 146 000	R182 290 000	R176 434 000	R184 627 000
Interest	R5 018 000	R4 278 000	R4 554 000	R4 759 000	R4 878 000
Fuel Levy	R0	R0	R0	R0	R0
Operational Revenue	R5 250 000	R12 988 000	R12 003 000	R12 544 000	R12 857 000
Gains on disposal of assets	R0	R45 000	R114 000	R119 000	R122 000
Other Gains	R465 000	R5 546 000	R5 546 000	R5 796 000	R5 940 000
Total	**R708 476 000**	**R790 416 000**	**R850 549 000**	**R873 573 000**	**R898 531 000**

Source: 2025/2026 Medium Term Revenue and Expenditure Framework for Theewaterskloof Municipality: Table A4 – Budgeted Financial Performance (Revenue and Expenditure)

Capital: The Capital Budget of Theewaterskloof for the last five financial years were roughly between R78 million and R145 million per year. Capital funding will have to increase substantially if existing service levels are to be sustained, which has to be the goal. In this regard Theewaterskloof Municipality's own funding, as well as the MIG funding must significantly exceed inflation. Other possible sources of funding and innovative funding mechanisms have to be explored.

It is important for Theewaterskloof Municipality to manage their charges for water and sanitation services and the control of consumer payments effectively, in order to ensure that adequate income is generated to fund their water and sewerage capital projects. The future funding sources of Theewaterskloof Municipality's total capital budget are summarised in the table below.

Table C.7.4: Sources of funding for the future capital budgets of Theewaterskloof Municipality

Capital Funding Source	2023/2024 Audited Outcome	2024/2025 Pre-Audit Outcome	2025/2026 Budget	2026/2027 Budget	2027/2028 Budget
National Government	R38 489 000	R32 346 000	R27 537 000	R34 900 000	R36 380 000
Provincial Government	R39 763 000	R29 506 000	R44 700 000	R108 020 000	R110 200 000
District Municipality	R0	R70 000	R0	R0	R0
Borrowing	R38 095 000	R0	R10 000 000	R0	R0
Internally generated funds	R9 820 000	R118 248 000	R6 593 000	R8 788 000	R5 457 000
Total Capital Funding	**R126 167 000**	**R180 170 000**	**R88 830 000**	**R151 708 000**	**R152 037 000**

Source: 2025/2026 Medium Term Revenue and Expenditure Framework for Theewaterskloof Municipality: Table A5 - Capital Expenditure by Vote, Standard Classification and Funding

The Municipality remains highly dependent on the MIG to fund their future water and sewerage capital budgets. The Municipality will only take up loans to fund their capital projects as a matter of last resort, due to the cost of credit. The Municipality has to strike a balance between the community needs and the affordability of the service, in order to stay financial sustainable.

Tariff and Charges: The state of the economy has an adverse effect on the consumers. As a result, municipalities' revenues and cash flows are expected to remain under pressure. Furthermore, municipalities should carefully consider affordability of tariff increases, especially as it relates to domestic consumers while considering the level of services versus the associated cost. Water tariffs should always be cost reflective and the water tariff structure must therefore ensure that:

- Water tariffs are fully cost-reflective, including the cost of maintenance and renewal of purification plants, water networks and the cost associated with reticulation expansion;
- Water tariffs are structured to protect basic levels of service and ensure the provision of free water to the poorest of the poor (indigent); and
- Water tariffs are designed to encourage efficient and sustainable consumption.

Theewaterskloof Municipality's current five block step residential water tariff structure does not adequately discourage the wasteful or inefficient use of water (Cost of higher blocks are too low, compared to other Municipalities). The sustainable supply of potable water is becoming an ever increasing challenge. This scarce commodity has to be optimally managed. The increase in the price of electricity and chemicals for purification has contributed to the cost of delivering the service.

The table below gives some comments on the specific blocks, with regard to Theewaterskloof Municipality's block step residential water tariff structure, for the various financial years.

Table C.7.5: Comments on the Municipality's block step residential water tariff structure

Block (kl/month)	2021/2022	2022/2023	2023/2024	2024/2025	Comments
0 - 6	R9-57	R10-35	R11-30	R11-91	Free Basic Water
7 - 15	R11-39	R12-35	R13-48	R14-17	Low volume use
16 - 30	R23-65	R25-57	R27-91	R29-30	Typical use volume, including garden irrigation
31 – 40	R29-48	R31-91	R34-87	R36-61	Above average use, including garden irrigation
41 - 45	R39-13	R42-26	R46-09	R48-35	
46 - 70					Wasteful use and/or severe garden irrigation
> 70					Significant waste and/or unnecessary garden irrigation

Theewaterskloof Municipality's residential water tariffs for usage above 30 Kl should be increased further to more effectively promote the efficient use of water and discourage the wastage of water.

The water tariffs of Swartland Municipality, Drakenstein Municipality and Overstrand Municipality for the 2024/2025 financial year and their block stepped residential water tariff structures, that adequately promote the efficient use of water, are indicated in the table below.

Table C.7.6: 2024/2025 Residential water tariff structures of three Municipalities that adequately promote the efficient use of water

Swartland Municipality		Drakenstein Municipality		Overstrand Municipality	
Block (kl/month)	Rand per Kl	Block (kl/month)	Rand per Kl	Block (kl/month)	Rand per Kl
0 - 6	R6-44	0 - 6	R6-80	0 – 6	R7-22
7 - 10	R10-58	7 - 10	R12-07	7 – 18	R14-81
11 - 15	R20-07	11 - 15	R17-32	19 – 45	R31-04
16 – 20	R25-78	16 - 30	R22-50	46 – 60	R62-06
21 – 25	R37-86	31 - 45	R31-41	> 60	R82-76
26 – 35	R56-94	46 - 55	R66-38		
> 35	R106-18	> 55	R99-58		

Wasteful or inefficient use of water is discouraged through increased tariffs. It is suggested that the following tariff structure characteristics should remain in Theewaterskloof Municipality's Structure in order to ensure efficient water use (WDM Strategy):

- Maintain a rising block tariff structure.
- Keep number of blocks in the tariff to a minimum. One block to address free basic water (the first step) and another to address the "cut-off" volume where consumers are discouraged to use water above this monthly volume (highest block) are required. In addition, another three blocks could be used to distinguish between low users, typical use of high water use.
- The volumetric steps should be kept the same for all the areas within Theewaterskloof Municipality's Management Area.
- The cost of water in the maximum step should severely discourage use in this category. The volumetric use for the highest category could be 60 kl/month, above which residential water use could be considered to be wasteful or unnecessary. Garden use requiring in excess of this volume should be reduced in accordance with xeriscape practices.

The MFMA Circular No.78 of 7 December 2015 stipulated the following w.r.t. the water and sanitation tariff increases:

Municipalities should consider the full cost of rendering the water and sanitation services when determining tariffs related to these two services. If the tariffs are low and result in the municipality not recovering their full costs, the municipality should develop a pricing strategy to phase-in the necessary tariff increases in a manner that spreads the impact on consumers over a period of time.

Municipalities are urged to design an Inclining Block Tariff structure that is appropriate to its specific circumstances and ensures an appropriate balance between low income consumers and other domestic, commercial and business customers, and the financial interests of the municipality. While considering this structure, municipalities are advised to evaluate if the IBT system will be beneficial to them depending on consumption patterns in their areas.

In light of the current drought being experienced across large parts of the country, and to mitigate the need for water tariff increases, municipalities must put in place appropriate strategies to limit water losses to acceptable levels. In this regard municipalities must ensure that water used by their own operations is charged to the relevant service, and not simply attributed to water losses.

The recommendations for the water and sewerage tariffs of Theewaterskloof Municipality are as follows:

- Theewaterskloof Municipality's residential water tariffs for usage above 40 Kl should be increased further to more effectively promote the efficient use of water and discourage the wastage of water. A financial analysis of the tariffs first needs to be carried out to determine the most effective tariff adjustments (Blocks and Tariffs).
- Theewaterskloof Municipality can investigate the financial viability of changing the sanitation tariff structure from a fixed monthly amount, which is also not based on the number of toilet pans, to a stepped tariff based on water consumption in the future. Volumetric usage for sanitation services, whereby charges are determined according to water usage, with maximum ceilings and charged accordingly. This will need to include a free sanitation bracket, similar for free water. This will also further deter wasteful water use.
- Theewaterskloof Municipality will continue to re-evaluate the tariffs they charge for their water and sanitation services on an annual basis in order to put the Municipality in a better financial position to ensure that all the O&M expenditure for water and sanitation services are always recovered through their water and sanitation services income, to address the bulk infrastructure backlogs and to ensure the adequate rehabilitation and maintenance of all existing water and sewerage infrastructure within the various towns.

- The large commercial and industrial consumers could lower their current water demand by means of improved practices or re-use of waste water. Theewaterskloof Municipality should note that revenue could potentially decrease as a result of reuse practices.

- Theewaterskloof Municipality needs to continue with the monitoring of the volume and nutrient loading of all industrial effluent discharged by industrial consumers into the sewer system. A formula for the calculation of the extraordinary treatment cost to industrial consumers for the industrial effluent they discharged into Theewaterskloof Municipality's sewer system is in place and part of the existing tariff structure. The performance of WWTWs in general can be severely compromised by certain industrial effluent discharges. It is therefore also important for Theewaterskloof Municipality to recalculate their treatment costs annually, in order to ensure that there is no under or over recovery of costs from industrial consumers. The charges for wastewater discharged by industrial consumers can also be linked to their water usage in the future.

- Regular sampling of the quality of industrial effluent discharged into the sewer system needs to be done and all industrial consumers need to be charged according to the quality of the effluent discharged into the Municipality's sewer system.

- The water tariff structure for commercial consumers consists of three blocks. The rising block tariff structure also promotes water conservation. The possibility of more blocks in the step tariff structure for these consumers should be investigated, in order to promote water conservation even further amongst these consumers.

- The current sanitation charges for commercial consumers are calculated from the number of toilet pans and urinals. Theewaterskloof Municipality can also investigate the financial viability of linking the sanitation charges to the water usage of the commercial consumers in the future, in order to further discourage the wasteful or inefficient use of water.

- The current water tariff codes adequately differentiate between the different type of consumers and their water usage. The Municipality can investigate the possibility to uniquely describe the "Departmental" water usage with a distinction between the different user types, for example parks, office usage, fire-fighting, etc.

TOPIC 8: WATER SERVICES INSTITUTIONAL ARRANGEMENTS AND CUSTOMER SERVICES

Sections 12 and 13 of the Water Services Act (Act No 108 of 1997) place a duty on WSAs to prepare and maintain a WSDP, as part of the process of preparing an IDP. The DWS has developed a new eWSDP website to assist WSAs with the WSDP process and to provide a framework for the capturing of the data. The WSDP of Theewaterskloof Municipality needs to be updated regularly.

The Municipality will also continue to report annually and in a public way on progress in implementing the plan (WSDP Performance- and Water Services Audit Report), as part of Theewaterskloof Municipality's Annual Report, as required in terms of Section 18 of the Water Services Act, 1997 (Act No.108 of 1997), as well as the "Revised Compulsory National Water and Sanitation Services Standards" in terms of Section 9(1) of the Water Services Act, as included in Gazette No.52814 of 6 June 2025.

The Water Safety Plans for the various WTWs and water distribution systems and the W_2RAPs for the WWTWs and sewer drainage networks need to be updated regularly. WTW and WWTW Process Audits also need to be compiled regularly.

The 2019/2020 Water and Sewer Master Plans of Theewaterskloof Municipality summarise the projects (Master Plan Items) necessary in order to cope with the increased future demands and developments within the Theewaterskloof Municipality's systems. The Water and Sewer Master Plans need to be updated regularly (At least once every five years).

A Work Place Skills Plan is in place, which lists the training to be provided during the new financial year. The training of Theewaterskloof Municipality's personnel involved in the management of water and sanitation services are the most important factors that determine the ability of Theewaterskloof Municipality to deliver safe and reliable water and to treat the effluent at the WWTWs to an acceptable standard. Training of all staff involved in water supply and sanitation services on matters related to treatment processes and quality

monitoring and control is essential because their actions (or failure to act) will have a major impact on the well-being of the communities and the environment.

It is important for Theewaterskloof Municipality to classify all WTWs, WWTWs and Process Controllers along the lines of the new Regulation 3630 requirements by establishing a programme for certification of works, operators, technicians and managers. The process will include reviewing the skills needed and aligning resources to these needs as well as reviewing total staff numbers necessary to meet all the objectives in the National Water Act.

The table below provides an overview of the current Process Controllers at the WTWs and WWTWs and whether additional Process Controllers are required in order to comply with Regulation 3630.

Table C.8.1: Required number of Process Controllers at the WTWs and WWTWs	
WTWs	
Bot River	The minimum requirement for a Class D WTW is one Class II PC per shift, plus one on standby. For the Bot Rivier WTW, with one shift, there should therefore be two PCs with minimum Class II classifications. The current Class I PC needs to receive the required training to be registered as a Class II PC or one additional Class II PC needs to be appointed in order to comply.
Caledon	The minimum requirement for a Class C WTW is one Class III PC per shift, plus one on standby. For the Caledon WTW, with one shift, there should therefore be two PCs with minimum Class III classifications. The current number of PCs at the plant is adequate.
Genadendal	The minimum requirement for a Class D WTW is one Class II PC per shift, plus one on standby. For the Genadendal WTW, with one shift, there should therefore be two PCs with minimum Class II classifications. The current number of PCs at the WTW is adequate.
Voorstekraal	The minimum requirement for a Class C WTW is one Class III PC per shift, plus one on standby. For the Voorstekraal WTW, with one shift, there should therefore be two PCs with minimum Class III classifications. The current number of PCs at the plant is adequate.
Bereaville	The minimum requirement for a Class C WTW is one Class III PC per shift, plus one on standby. For the Bereaville WTW, with one shift, there should therefore be two PCs with minimum Class III classifications. The current number of PCs at the plant is adequate.
Grabouw	The minimum requirement for a Class B WTW is one Class IV PC per shift, plus one on standby. For the Grabouw WTW, with three shifts, there should therefore be four PCs with minimum Class IV classifications. The current number of PCs at the plant is adequate.
Greyton	The minimum requirement for a Class C WTW is one Class III PC per shift, plus one on standby. For the Greyton WTW, with one shift, there should therefore be two PCs with minimum Class III classifications. The current two Class II PCs need to receive the required training to be registered as Class III PCs or two additional Class III PCs needs to be appointed in order to comply.
Riviersonderend	The minimum requirement for a Class C WTW is one Class III PC per shift, plus one on standby. For the Riviersonderend WTW, with one shift, there should therefore be two PCs with minimum Class III classifications. The current two Class II PCs need to receive the required training to be registered as Class III PCs or two additional Class III PCs needs to be appointed in order to comply.
Tesselaarsdal	The minimum requirement for a Class D WTW is one Class II PC per shift, plus one on standby. For the Tesselaarsdal WTW, with one shift, there should therefore be two PCs with minimum Class II classifications. The current number of Process Controllers at the plant is not adequate.
Villiersdorp	The minimum requirement for a Class C WTW is one Class III Process Controller per shift, plus one on standby. For the Villiersdorp WTW, with one shift, there should therefore be two PCs with minimum Class III classifications. The current Class II PC needs to receive the required training to be registered as a Class III PC or one additional Class III PC needs to be appointed in order to comply.
WWTWs	
Bot River	The minimum requirement for a Class C WWTW is one Class III PC per shift, plus one on standby. For the Bot River WWTW, with one shift, there should therefore be two PCs with minimum Class III classifications. The current two Class II PCs need to receive the required training to be registered as Class III PCs or one additional Class III PC needs to be appointed in order to comply.
Caledon	The minimum requirement for a Class C WWTW is one Class III PC per shift, plus one on standby. For the Caledon WWTW, with one shift, there should therefore be two PCs with minimum Class III classifications. The current one Class II PC needs to receive the required training to be registered as a Class III PC and one additional Class III PC needs to be appointed in order to comply.
Genadendal	The minimum requirement for a Class D WWTW is one Class II PC per shift, plus one on standby. For the Genadendal WWTW, with one shift, there should therefore be two PCs with minimum Class II classifications. Municipality needs to appoint one additional Class II Process Controller for the WWTW in order to comply.
Grabouw	The minimum requirement for a Class C WWTW is one Class III PC per shift, plus one on standby. For the Grabouw WWTW, with three shifts, there should therefore be four PCs with minimum Class III classifications. Current number and Class of Process Controllers are adequate for the plant.
Greyton	The minimum requirement for a Class D WWTW is one Class II PC per shift, plus one on standby. For the Greyton WWTW, with one shift, there should therefore be two PCs with minimum Class II classifications. Municipality needs to appoint one additional Class II PC for the WWTW in order to comply.

Table C.8.1: Required number of Process Controllers at the WTWs and WWTWs	
WTWs	
Riviersonderend	The minimum requirement for a Class E WWTW is one Class I PC per shift, plus one on standby. For the Riviersonderend WWTW, with one shift, there should therefore be two PCs with minimum Class I classifications. The current two Learner PCs need to receive the required training to be registered as a Class I PCs or two Class I PCs need to be appointed in order to comply.
Tesselaarsdal	The minimum requirement for a Class E WWTW is one Class I Process Controller per shift, plus one on standby. For the Tesselaarsdal WWTW, with one shift, there should therefore be two PCs with minimum Class I classifications. Current number and Class of Process Controllers are not adequate for the plant.
Villiersdorp	The minimum requirement for a Class C WWTW is one Class III PC per shift, plus one on standby. For the Villiersdorp WWTW, with one shift, there should therefore be two PCs with minimum Class III classifications. Current number and Class of Process Controllers are not adequate for the plant. Two Class II PCs need to be appointed in order to comply.

All critical water vacant positions as indicated on the approved Organogram needs to be filled as soon as possible. Theewaterskloof Municipality needs to review the skills needed at each of the WTWs and WWTWs according to the classification of the plants and the number of shifts at each of the plants and need to align resources to these needs as well as reviewing total staff numbers necessary to meet all the objectives in the National Water Act.

The Occupational Health and Safety Act contain provisions directing employers to maintain a safe workplace and to minimize the exposure of employees and the public to workplace hazards. It is therefore important for Theewaterskloof Municipality to compile a Legal Compliance Audit of their WTWs and WWTWs, which will provide the management of Theewaterskloof Municipality with the necessary information to establish whether the Municipality is in compliance with the legislation or not. It is further recommended that Theewaterskloof Municipality arrange for chlorine audits to be done at all their disinfection facilities, in order to identify any potential shortcomings.

Theewaterskloof Municipality has a comprehensive Performance Management System in place. The performance indicators as included in the SDBIP are regularly reviewed in order to promote a culture of performance management among its political structures, political office bearers and councillors and in its administration and administer its affairs in an economical, effective, efficient and accountable manner.

Potential exist for the improvement on the mechanisms that are in place in order to ensure compliance with the Municipality's Water Supply and Sanitation Services By-law.

Access to safe drinking water is essential to health and is human right. Safe drinking water that complies with the SANS:241 Drinking Water specifications do not pose a significant risk to health over a lifetime of consumption, including different sensitivities that may occur between life stages. Theewaterskloof Municipality is therefore committed to ensure that their water quality always complies with national safety standards.

Theewaterskloof Municipality is committed to maintain the existing high level of customer service in their urban areas and to record all the necessary information for the WSDP on an annual basis. The present Customer Services and Complaints System allow for the recording and management of all water and sanitation related complaints. The Municipality is committed to ensure that all water and sanitation related complaints are recorded and that the complaints are addressed within the required time period. The Customer Services Charter should also be updated regularly.

SECTION D: WATER SERVICES OBJECTIVES AND STRATEGIES

The water services strategies presented below were derived from the 2023/2024, 2024/2025 and 2025/2026 SDBIPs and the water services situational analysis as summarized in Section C: Water Services Existing Needs Perspective and presents the 5-year Water Services strategies as established in the WSA's WSDP.

Table D.1: Strategies, Objectives and Key Performance Indicators for Theewaterskloof Municipality								
Nr	**Objective / Strategy**	**Key Performance Indicator**	**Baseline 2023/2024**	**FY2024/25**	**FY2025/26**	**FY2026/27**	**FY2027/28**	**FY2028/29**
Topic 1: Settlement Demographics and Public Amenities								
	Implement by other Department							
Topic 2: Service Levels Profile								
TL11	Basic services for all	Provide 6kl free basic water per month to all indigent households during the financial year	Target 6 100 Actual 6 295	6 200	6 250	Target still to be set	Target still to be set	Target still to be set
TL14	Basic services for all	Provide free basic sanitation to indigent households in terms of the Equitable Share requirements during the financial year	Target 6 250 Actual 6 295	6 250	6 250	Target still to be set	Target still to be set	Target still to be set
TL15	Basic services for all	Number of residential properties that receive piped water that is connected to the municipal water infrastructure network and billed for the services during 2025/26 financial year.		15 980	15 980	Target still to be set	Target still to be set	Target still to be set
TL18	Basic services for all	Number of residential properties connected to the municipal waste water sanitation / sewer network for sewerage services and billed for services during the 2025/26 financial year.		15 620	15 680	Target still to be set	Target still to be set	Target still to be set
New	Ensure all households on the farms are provided with at least basic water services and complying with basic water service requirements as included in Gazette 52814 of 6 June 2025.	Support all applications received for basic water services on the farms (Subject to availability of financial resources and sustainability of type of service).	-	-	-	50% of applications received are supported (Subject to availability of funding and sustainability of type of service)	75% of applications received are supported (Subject to availability of funding and sustainability of type of service)	100% of applications received are supported (Subject to availability of funding and sustainability of type of service)
New	Ensure all households on the farms are provided with at least basic sanitation services and complying with basic sanitation service requirements as included in Gazette 52814 of 6 June 2025.	Support all applications received for basic sanitation services on the farms (Subject to availability of financial resources and sustainability of type of service).	-	-	-	50% of applications received are supported (Subject to availability of funding and sustainability of type of service)	75% of applications received are supported (Subject to availability of funding and sustainability of type of service)	100% of applications received are supported (Subject to availability of funding and sustainability of type of service)
New	*Provision of water to informal households based on the standard of 1 water point to 25 households.*	*Number of communal taps installed in relation to the number of informal households.*	-	-	-	*Additional 50 communal taps installed (Provide at least 1 water point to every 25 households in informal areas)*	*Additional 50 communal taps installed (Provide at least 1 water point to every 25 households in informal areas)*	*Additional 50 communal taps installed (Provide at least 1 water point to every 25 households in informal areas)*
New	*Provision of sanitation service to informal households based on the standard of 1 toilet to 10 households.*	*Number of toilet structures provided in relation to the number of informal households.*	-	-	-	*Additional 100 communal toilets installed (Provide at least 1 toilet to every 10 households in informal areas)*	*Additional 150 communal toilets installed (Provide at least 1 toilet to every 10 households in informal areas)*	*Additional 200 communal toilets installed (Provide at least 1 toilet to every 10 households in informal areas)*
Topic 3: Water Services Asset Management								
New	*Ensure adequate storage capacity*	*Ensure adequate storage capacity for all towns (At least 48hrs AADD).*	-	-	-	*All areas with an overall storage capacity above 48hrs AADD.*	*All areas with an overall storage capacity above 48hrs AADD.*	*All areas with an overall storage capacity above 48hrs AADD.*

Table D.1: Strategies, Objectives and Key Performance Indicators for Theewaterskloof Municipality								
Nr	**Objective / Strategy**	**Key Performance Indicator**	**Baseline 2023/2024**	**FY2024/25**	**FY2025/26**	**FY2026/27**	**FY2027/28**	**FY2028/29**
New	*Implement projects included in the Water Master Plan*	*Ensure adequate water pump station and water reticulation capacity.*	-	-	-	*Upgrade existing water pump stations and provide new pump stations as identified in the Water Master Plan. Upgrade water reticulation networks as proposed in the Water Master Plan.*	*Upgrade existing water pump stations and provide new pump stations as identified in the Water Master Plan. Upgrade water reticulation networks as proposed in the Water Master Plan.*	*Upgrade existing water pump stations and provide new pump stations as identified in the Water Master Plan. Upgrade water reticulation networks as proposed in the Water Master Plan.*
New	*Implement projects included in the Sewer Master Plan*	*Ensure adequate sewer pump station and sewer drainage network capacity.*	-	-	-	*Upgrade existing sewer pump stations and provide new pump stations as identified in the Sewer Master Plan. Upgrade sewer drainage networks as proposed in the Sewer Master Plan.*	*Upgrade existing sewer pump stations and provide new pump stations as identified in the Sewer Master Plan. Upgrade sewer drainage networks as proposed in the Sewer Master Plan.*	*Upgrade existing sewer pump stations and provide new pump stations as identified in the Sewer Master Plan. Upgrade sewer drainage networks as proposed in the Sewer Master Plan.*
Topic 4: Water Services Operation and Maintenance								
TL28	Basic services for all	65% of effluent samples comply with permit values {(% compliance of all WWTW's achieved / the number of WWTW's tested)}	Target 65% Actual 58.18%	65%	65%	70%	75%	80%
TL27	Basic services for all	Achieve an average of 90% water sample compliance with SANS 241 micro biological indicators Water Treatment Works {(% achievement all WTW's/WTW's tested) by 30 June	Target 90% Actual 92.2%	90%	90%	90%	90%	90%
New	*Implement recommendations from detail WTW Technical Process Audits.*	*% Of recommendations, as included in the WTW Process Audits, implemented.*	-	-	-	*50% of recommendations implemented*	*70% of recommendations implemented*	*90% of recommendations implemented*
New	*Implement recommendations from detail WWTW Technical Process Audits.*	*% Of recommendations, as included in the WWTW Process Audits, implemented.*	-	-	-	*50% of recommendations implemented*	*70% of recommendations implemented*	*90% of recommendations implemented*
New	*Implement recommendations as included in the Improvement / Upgrade Plan of the Water Safety Plan*	*% Of recommendations, as included in the Improvement / Upgrade Plan of the Water Safety Plan, implemented.*	-	-	-	*50% of recommendations implemented*	*70% of recommendations implemented*	*90% of recommendations implemented*
New	*Implement recommendations as included in the Improvement / Upgrade Plan of the W_2RAPs.*	*% Of recommendations, as included in the Improvement / Upgrade Plan of the W_2RAPs, implemented.*	-	-	-	*50% of recommendations implemented*	*70% of recommendations implemented*	*90% of recommendations implemented*
New	*Water Quality sampling programme complies with requirements.*	*Water Quality Sampling Programme complies with the minimum SANS241:2015 monitoring frequency for process indicators.*	-	-	-	*80%*	*90%*	*100%*
New	*Ensure adequate budget for the O&M of the existing water and sewerage infrastructure*	*Ensure a budget of at least 1.5% of the total value of the water and sewerage assets is*	-	-	-	*A budget of 1.5% or more of the value of the water and sewerage assets is*	*A budget of 1.5% or more of the value of the water and sewerage*	*A budget of 1.5% or more of the value of the water and sewerage*

Table D.1: Strategies, Objectives and Key Performance Indicators for Theewaterskloof Municipality								
Nr	**Objective / Strategy**	**Key Performance Indicator**	**Baseline 2023/2024**	**FY2024/25**	**FY2025/26**	**FY2026/27**	**FY2027/28**	**FY2028/29**
		allocated towards the annual O&M of the systems.				*allocated towards the O&M of the systems.*	*assets is allocated towards the O&M of the systems.*	*assets is allocated towards the O&M of the systems.*
New	*Ensure adequate budget for the replacement of old water and sewerage infrastructure*	*Ensure a budget of at least 2% of the total value of the water and sewerage assets is allocated towards the replacement of existing infrastructure per annum.*	-	-	-	*A budget of 2% or more of the value of the water and sewerage assets is allocated towards the replacement of existing infrastructure.*	*A budget of 2% or more of the value of the water and sewerage assets is allocated towards the replacement of existing infrastructure.*	*A budget of 2% or more of the value of the water and sewerage assets is allocated towards the replacement of existing infrastructure.*
New	*Reporting on water quality and wastewater quality compliance percentages*	*Annual reporting on the percentage of water quality and wastewater quality compliance.*	-	-	-	*At least annual publication of water quality and wastewater quality compliance percentages.*	*At least annual publication of water quality and wastewater quality compliance percentages.*	*At least annual publication of water quality and wastewater quality compliance percentages.*
Topic 5: Conservation and Demand Management: Water Resource Management								
TL29	Basic services for all	Limit unaccounted water to less than 20% as at 30 June {(Number of Kiloliters Water Purchased or Purified - Number of Kiloliters Water Sold (incl free basic water) / Number of Kiloliters Water Purchased or Purified _ x 100}	Target 25% Actual 21.60%	22%	22%	20%	20%	20%
	Basic services for all	Submit quarterly reports to Management on the water losses and water loss reduction initiatives implemented by town offices as per project plan	-	Target 4; Actual 4	4	4	4	4
Topic 5: Conservation and Demand Management: Water Balance								
		Install and replace 1 000 pre-paid/smart water meters by 30 June	Target 1000 Actual 1 303	1 500	-	-	-	-
TL19	Maintenance, replacements and upgrades of municipal infrastructure.	Spend 95% of project budget on the replacement of water meters project by 60 June	-	95%	95%	-	-	-
New	*Detail IWA Water Balances for all the systems and monthly WTW flows for all the treatment plants.*	*Ensure all bulk water is metered at source, at WTW (incoming and outgoing) and at bulk storage reservoirs and the meters are read and recorded on at least a monthly basis.*	-	-	-	*80% of all sources metered and bulk water meters read and recorded at least monthly.*	*90% of all sources metered and bulk water meters read and recorded at least monthly.*	*100% of all sources metered and bulk water meters read and recorded at least monthly.*
New	*Monthly WWTW flows for all the treatment plants.*	*Ensure all incoming and outgoing flows at WWTWs are metered, as well as final effluent re-used for irrigation purposes and that meters are read and recorded on at least a monthly basis.*	-	-	-	*80% of all flows at WWTWs metered and meters read and recorded at least monthly.*	*90% of all flows at WWTWs metered and meters read and recorded at least monthly.*	*100% of all flows at WWTWs metered and meters read and recorded at least monthly.*
Topic 6: Water Resources								
New	*Implementation of Groundwater Management Programme*	*Ensure groundwater management programme for boreholes are implemented and raw water quality is monitored at least annually.*	-	-	-	*Implement Groundwater Management Programme*	*Implement Groundwater Management Programme and monitor*	*Implement Groundwater Management Programme and monitor*

Table D.1: Strategies, Objectives and Key Performance Indicators for Theewaterskloof Municipality								
Nr	**Objective / Strategy**	**Key Performance Indicator**	**Baseline 2023/2024**	**FY2024/25**	**FY2025/26**	**FY2026/27**	**FY2027/28**	**FY2028/29**
						and monitor raw water quality at least annually.	*raw water quality at least annually.*	*raw water quality at least annually.*
New	*All water sources are authorised.*	*% of Abstraction from sources registered and authorised by the DWS.*	-	-	-	*80% Compliance*	*90% Compliance*	*100% Compliance*
New	*Ensure adequate yield and allocations from water resources to meet the projected future water requirements.*	*Ensure yields and allocations are adequate to meet the projected five year water requirements for all systems.*	-	-	-	*100% Adequate supply to meet water requirements for all systems*	*100% Adequate supply to meet water requirements for all systems*	*100% Adequate supply to meet water requirements for all systems*
New	*Monitoring of industrial consumers.*	*% Monitoring of effluent discharged by industrial consumers (Quantity and Quality) and charged according to the quality of effluent discharged by them.*	-	-	-	*50% Of all Industrial Consumers monitored w.r.t. quality and quantity of effluent discharged by them*	*65% Of all Industrial Consumers monitored w.r.t. quality and quantity of effluent discharged by them*	*80% Of all Industrial Consumers monitored w.r.t. quality and quantity of effluent discharged by them*
Topic 7: Financial								
	Basic Service Delivery	Spend 95% of the project budget approved for the upgrade of the Villiersdorp Water Treatment Works by 30 June	Target 95% Actual 77.28%	-	-	-	-	-
	Basic Service Delivery	Spend 95% of the project budget approved for the upgrade of the Botrivier WWTW by 30 June 2024	Target 95% Actual 43.51%	-	-	-	-	-
	Basic Service Delivery	Spend 95% of the Capital Budget allocated for the Bulk Raw Water Pipe Replacement of Genadendal Berglyn Phase 1 by 30 June 2024	Target 95% Actual 77.67%	-	-	-	-	-
	Basic Service Delivery	Spend 95% of the capital budget allocated for the upgrade of Construction of New Bulk Water Pipeline in Grabouw: Phase 5.2 by 31 December 2023	Target 95% Actual 100.0%	-	-	-	-	-
	Basic Service Delivery	Spend 95% of the capital budget allocated for the upgrade of Caledon bulk sewerage Pipeline by 30 June 2024	Target 95% Actual 89.0%	-	-	-	-	-
	Basic Service Delivery	Spend 95% of the capital budget allocated for the Water Pipe Replacement Grabouw by 30 June 2024	Target 95% Actual 74.53%	-	-	-	-	-
	Basic Service Delivery	Spend 95% of the capital budget allocated for the Raw water pipe replacement - Basil Newmark Pipeline Phase 3 by 30 June 2024	Target 95% Actual 33.01%	-	-	-	-	-
	Day to Day Service Delivery	Spend 95% of the capital budget for the directorate spent by 30 June	-	Target 95%; Actual 59%	-	-	-	-
TL31	Maintenance, replacements and upgrades of municipal infrastructure.	Spend 95% of budget for the Botriver Treatment Works (Phase 2) by 30 June 2025	-	Target 95%; Actual 76%	95%	-	-	-
	Basic Service Delivery	Spend 95% of the capital budget for the Tesselaarsdal Water Pipeline (Phase 2) by 30 June 2025	-	Target 95%; Actual 100%	-	-	-	-

Table D.1: Strategies, Objectives and Key Performance Indicators for Theewaterskloof Municipality								
Nr	**Objective / Strategy**	**Key Performance Indicator**	**Baseline 2023/2024**	**FY2024/25**	**FY2025/26**	**FY2026/27**	**FY2027/28**	**FY2028/29**
	Basic Service Delivery	Spend 95% of the Capital Budget allocated for the Bulk Raw Water Pipe Replacement of Genadendal Berglyn Phase 2 by 30 June 2025	-	Target 95%; Actual 84%	-	-	-	-
	Basic Service Delivery	Spend 95% of the Capital Budget allocated for water pipe replacement in Ebenhaeser, Hofmeyer, Ryke, Gaffley, Plum and Sam Streets at Grabouw (Phase 2) by 30 June 2025	-	Target 95% Actual 0%	-	-	-	-
TL32	Maintenance, replacements and upgrades of municipal infrastructure.	Complete Phase 1 of the upgrade and expansion of the Villiersdorp Water Treat Works (WTW) by 30 June 2025 and Phase 2 by 30 June 2026	-	Target 1 Actual 0	1	-	-	-
TL33	Maintenance, replacements and upgrades of municipal infrastructure.	Spend 95% of the capital budget allocated for the upgrade of the Grabouw Gypsy Queen bulk sewer and water provision by 30 June 2025 and complete project by 30 June 2026	-	Target 95% Actual 55%	1	-	-	-
	Basic Service Delivery	Spend 95% of the Municipal Infrastructure Grant by 30 June 2025	-	Target 95% Actual 83%	95%	95%	95%	95%
Topic 8: Institutional Arrangements and Customer Care								
	Day to Day Service Delivery	Submit at least 1 funding source application for bulk infrastructure by 31 December	-	Target 1; Actual 1	-	-	-	-
	Day to Day Service Delivery	Review the Bulk Contribution Policy and submit to Council by 31 May	-	Target 1; Actual 0	-	-	-	-
	Day to Day Service Delivery	Review the Water and Sewerage By-Law and submit to Council by 31 May	-	Target 1; Actual 0	-	-	-	-
New	Ensure adequate Process Controllers at the WTWs according to Regulation 3630	% Compliance w.r.t the number of existing Process Controllers at the WTWs and the required number of Process Controllers	-	-	-	70 % Of WTW plants meeting the requirements, w.r.t. the number of Process Controllers per shift.	80 % Of WTW plants meeting the requirements, w.r.t. the number of Process Controllers per shift.	90 % Of WTW plants meeting the requirements, w.r.t. the number of Process Controllers per shift.
New	Ensure adequate Process Controllers at the WWTWs according to Regulation 3630	% Compliance w.r.t the number of existing Process Controllers at the WWTWs and the required number of Process Controllers	-	-	-	70 % Of WWTW plants meeting the requirements, w.r.t. the number of Process Controllers per shift.	80 % Of WWTW plants meeting the requirements, w.r.t. the number of Process Controllers per shift.	90 % Of WWTW plants meeting the requirements, w.r.t. the number of Process Controllers per shift.

SECTION E: WATER SERVICES MTEF PROJECTS

The approved 2025/2026 Water Services Medium-Term Expenditure Framework (MTEF) projects are presented below and outline the water services projects which might be funded for implementation within the next three financial years. Table E.2a provides the projects identified for implementation in FY2025/26, Table E.2b provides the projects identified for implementation in FY2026/27 and Table E2c provides the projects identified for implementation in FY2027/28.

It should be highlighted that the projects included herein, represents only projects for which funding might be secured, and therefore does not comprise the comprehensive water services project requirements of Theewaterskloof Municipality.

The summary of the MTEF water services projects are indicated in the table below.

Table E.1: Summary of MTEF Projects

Project Main Category	FY2025/26		FY2026/27		FY2027/28		MTEF Total	
	Nr	Value (R'000)	Nr	Value (R'000)	Nr	Value (R'000)	Nr	Value (R'000)
Water Projects	2	R12 281	1	R8 224	5	R24 088	**6**	**R44 593**
Sanitation Projects	2	R24 387	2	R29 464	4	R11 478	**5**	**R65 329**
Combined Water & Sanitation Projects	**4**	**R36 668**	**3**	**R37 688**	**9**	**R35 566**	**11**	**R109 922**

Table E.2a: Water Services MTEF Projects - FY2025/26 (1st year MTEF period)

Nr	Project Reference Number (Dept)	Project Name	Description	Project Driver	Main Category "W" or "S"	Sub Category	Component type	Project Budget / Funding Sources									MTEF Project Source
								Prev spent FY2024/25	FY2025/26 Budget	Own	MIG	RBIG	ACIP	DR	MWIG	Loan	Total Cost	
1. Infrastructure Projects								**R0**	**R31 668**								**R31 668**	
1.1		Upgrade of the Bot River WWTW	Increase capacity of WWTW	Ensure adequate treatment capacity	Sanitation	Bulk	WWTW		**R13 594**		R13 594						**R13 594**	WSDP and WWTW Process Audit
1.2		Grabouw outfall sewers	Upgrading of Grabouw Gypsy Queen Bulk Sewer and Water Provis	Higher level of sanitation services	Sanitation	Bulk	Bulk pipeline		**R10 793**		R10 793						**R10 793**	Sewer Master Plan
1.3		Upgrade Villiersdorp WTW	Upgrade of Villiersdorp Water Treat Works	Ensure adequate treatment capacity	Water	Bulk	WTW		**R7 281**	R4 131	R3 150						**R7 281**	WSDP and WTW Process Audit
									R0								**R0**	
2. Source Development Projects								**R0**	**R0**								**R0**	
									R0								**R0**	
3. Demand Management projects								**R0**	**R5 000**								**R5 000**	
3.1		Smart meters replacements	Replace faulty meters with smart water meters.	WC/WDM and reduce NRW	Water	Internal	WC/WDM		**R5 000**							R5 000	**R5 000**	WC/WDM Strategy and WSDP
									R0								**R0**	
4. O&M Commitments								**R0**	**R0**								**R0**	
Operations																		
									R0								**R0**	
Maintenance																		
									R0								**R0**	
5. Institutional								**R0**	**R0**								**R0**	
									R0								**R0**	
6. Water Services Programmes								**R0**	**R0**								**R0**	
Awareness Programs																		
									R0								**R0**	
WASH Programs																		
									R0								**R0**	
		Total						**R0**	**R36 668**								**R36 668**	

Table E.2b: Water Services MTEF Projects - FY2026/27 (2nd year MTEF period)

Nr	Project Reference Number (Dept)	Project Name	Description	Project Driver	Main Category "W" or "S"	Sub Category	Component type	Project Budget / Funding Sources									MTEF Project Source
								Prev spent FY2025/26	FY2026/27 Budget	Own	MIG	RBIG	ACIP	DR	MWIG	Loan	Total Cost	
1. Infrastructure Projects								**R0**	**R37 688**								**R37 688**	
1.1		Upgrade of the Riviersonderend WWTW	Increase capacity of WWTW	Ensure adequate treatment capacity	Sanitation	Bulk	WWTW		**R7 811**		R7 811						**R7 811**	WSDP and WWTW Process Audit
1.2		Upgrade of the Bot River WWTW	Increase capacity of WWTW	Ensure adequate treatment capacity	Sanitation	Bulk	WWTW		**R21 653**	R7 109	R14 544						**R21 653**	WSDP and WWTW Process Audit
1.3		Upgrade Villiersdorp WTW	Upgrade of Villiersdorp Water Treat Works	Ensure adequate treatment capacity	Water	Bulk	WTW		**R8 224**	R896	R7 328						**R8 224**	WSDP and WTW Process Audit
									R0								**R0**	
2. Source Development Projects								**R0**	**R0**								**R0**	
									R0								**R0**	
3. Demand Management projects								**R0**	**R0**								**R0**	
3.1									**R0**								**R0**	
4. O&M Commitments								**R0**	**R0**								**R0**	
Operations																		
									R0								**R0**	
Maintenance																		
									R0								**R0**	
5. Institutional								**R0**	**R0**								**R0**	
									R0								**R0**	
6. Water Services Programmes								**R0**	**R0**								**R0**	
Awareness Programs																		
									R0								**R0**	
WASH Programs																		
									R0								**R0**	
		Total						**R0**	**R37 688**								**R37 688**	

Table E.2c: Water Services MTEF Projects - FY2027/28 (3rd year MTEF period)

Nr	Project Reference Number (Dept)	Project Name	Description	Project Driver	Main Category "W" or "S"	Sub Category	Component type	Project Budget / Funding Sources										MTEF Project Source
								Prev spent FY2026/27	FY2027/28 Budget	Own	MIG	RBIG	ACIP	DR	MWIG	Loan	Total Cost	
1. Infrastructure Projects								**R0**	**R35 566**								**R35 566**	
1.1		Upgrade of the Riviersonderend WWTW	Increase capacity of WWTW	Ensure adequate treatment capacity	Sanitation	Bulk	WWTW		**R5 670**	R2 593	R3 077						**R5 670**	WSDP and WWTW Process Audit
1.2		Upgrade of the Grabouw WWTW	Grabouw WWTW upgrade	Ensure adequate treatment capacity	Sanitation	Bulk	WWTW		**R2 199**		R2 199						**R2 199**	WSDP and WWTW Process Audit
1.3		Upgrade of the Caledon WWTW	Caledon WWTW upgrade	Ensure adequate treatment capacity	Sanitation	Bulk	WWTW		**R1 000**		R1 000						**R1 000**	WSDP and WWTW Process Audit
1.4		Upgrade of the Greyton WWTW	Increase capacity of WWTW	Ensure adequate treatment capacity	Sanitation	Bulk	WWTW		**R2 609**		R2 609						**R2 609**	WSDP and WWTW Process Audit
1.5		New Reservoir: Grabouw	Grabouw WEST bulk supply upgrades Steenbras upper: NEW 6.5Ml	Ensure adequate storage capacity	Water	Bulk	Reservoir		**R15 714**		R15 714						**R15 714**	WSDP and Water Master Plan
1.6		Upgrade Riviersonderend WTW	Upgrade of Riviersonderend Ultra Filtration Plant	Ensure adequate treatment capacity	Water	Bulk	WTW		**R2 743**		R2 743						**R2 743**	WSDP and WTW Process Audit
1.7		Upgrade Villiersdorp WTW	Upgrade of Villiersdorp Water Treat Works	Ensure adequate treatment capacity	Water	Bulk	WTW		**R2 046**	R2 046							**R2 046**	WSDP and WTW Process Audit
1.8		Upgrade Genadendal WTW	Upgrading of the Ultra Filtration Plant in Genadendal	Ensure adequate treatment capacity	Water	Bulk	WTW		**R2 609**		R2 609						**R2 609**	WSDP and WTW Process Audit
1.9		New Reservoir: Villiersdorp	Villiersdorp Destiny Farm Reservoir	Ensure adequate storage capacity	Water	Bulk	Reservoir		**R977**		R977						**R977**	WSDP and Water Master Plan
									R0								**R0**	
2. Source Development Projects								**R0**	**R0**								**R0**	
									R0								**R0**	
3. Demand Management projects								**R0**	**R0**								**R0**	
									R0								**R0**	
4. O&M Commitments								**R0**	**R0**								**R0**	
Operations																		
									R0								**R0**	
Maintenance																		
									R0								**R0**	
5. Institutional								**R0**	**R0**								**R0**	
									R0								**R0**	
6. Water Services Programmes								**R0**	**R0**								**R0**	
Awareness Programs																		
									R0								**R0**	
WASH Programs																		
									R0								**R0**	
		Total						**R0**	**R35 566**								**R35 566**	

SECTION F: WSDP PROJECTS

Theewaterskloof Municipality's approved 2025/2026 Capital Budget list the following major water and sewerage infrastructure projects (Value above R1 million over the three years), which are planned for the short term (Next three years).

- Upgrading of Grabouw Gypsy Queen Bulk Sewer and Water Provision.
- Upgrading of Grabouw-, Caledon-, Riviersonderend-, Greyton- and Bot River WWTW.
- Installation of Smart water meters.
- New 6.5 Ml Upper Steenbras reservoir, Grabouw West bulk supply upgrades.
- New Destiny Farm reservoir.
- Continue with the upgrading of the Villiersdorp WTW.
- Upgrade Riviersonderend- and Genadendal WTW.

The NWRS 2 list the following steps to raise the water profile in development planning:

- Water must be placed at the center of integrated planning and decision-making, with a specific aim to respond to and support the achievement of national development and sector goals.
- Current budgets need to adequately provide for water, which might mean they have to be doubled to cater for the present needs.
- Current financial values need to appreciate water as a scarce resource and should thus reflect the real value of water. This requires a new value system across all sectors and stakeholders.
- Water efficiency and curbing water losses should be high on the agenda of each individual and institution in the country.
- Water management must be formally embedded in the sector businesses with associated accountability.

The DWS will insist in the future that all water infrastructure which they fund is value engineered against the life-cycle cost with a specific emphasis on energy costs. Evidence will be required that the technical design is appropriate for the nature of the resource and that operation and maintenance of the assets is reasonably within the capability of the responsible institution. New water resources infrastructure will also not be developed or authorized unless effective WC/WDM interventions have been put in place in the affected area.

The identification of projects necessary to ensure the provision of adequate levels of water and sanitation services is based primarily on the findings of the Water and Sewer Master Plans. Master Planning is typically based on a forward planning horizon of 20 years, but is usually updated every three to five years, taking into account improved water demand estimates and subsequent infrastructure developments which may have taken place. The recommended projects from the 2019 Master Plans were incorporated into the WSDP.

The Master Plans represent the ideal infrastructure development required to meet projected water demands over the next few years, while realistic capital investment in infrastructure projects is determined by budget availability. As a result, prioritization of projects is necessary to identify what can be done within the available and projected budget constraints. The prioritization of projects is done through the IDP and annual budget planning process.

Recommended infrastructure projects for implementation in the future by Theewaterskloof Municipality will be based on the following plans and processes:

- Water and Sewer Master Plans and Water and Waste Water Treatment Works Master Plans/studies;
- Infrastructure replacement needs (Asset Register);
- Ad-hoc technical investigations;
- Budget proposals; and
- Asset Management Plans.

The current needs projects are estimated at R272 million of which 40 % are funded, as included in the MTEF project list. It should however be emphasised that additional funding will be required to address the full achievement of the water services strategies as outlined in Section D, but that the extent of such additional funding can only be determined, once initial investigations and activities have been concluded.

WSDP EXECUTIVE SUMMARY 2022-2027

Table F.1: WSDP FY2025/26: LIST OF CONCEPTUAL PROJECTS

Nr	Situation Assessment (Problem Definition)	Solution description as defined by topic situation assessment (Strategy)	Conceptual project	Is there an existing project addressing this problem?	Existing Projects Information			Does this current listed project address the problem totally?	Approved by Council, in project database and part of 5 year IDP cycle projects?	Project listed in 3yr MTEF - cycle?
					Project Number (Dept)	Project Title	Project Cost R'000			
CURRENT NEEDS										
Topic 1: Settlements and Demographics										
	Done by other Department									
Topic 2: Service Levels										
2.1	Some households on the farms without basic water services	Provide basic water services to the households on farms without services.	WSDP	No	TWK2526001	Install basic water services to the households on the farms without basic services	R4 440	Yes	No	No
2.2	Some households on the farms without basic sanitation services	Provide basic sanitation services to the households on the farms without services.	WSDP	No	TWK2526002	Install basic sanitation services to the households on the farms without basic services	R13 200	Yes	No	No
2.3	Some informal areas without adequate communal water services.	Provide communal services to all households in informal areas without adequate communal water services at a ratio of 25 households per 1 communal tap.	WSDP	No	TWK2526003	Install communal water facilities in informal areas without basic water services.	R10 380	Yes	Partially	Partially
2.4	Some informal areas without adequate communal sanitation services.	Provide communal services to all households in informal areas without adequate communal services at a ratio of 10 households per 1 communal toilet.	WSDP	No	TWK2526004	Install communal sanitation facilities in informal areas without basic sanitation services.	R39 325	Yes	Partially	Partially
2.5	The existing service levels of the primary schools in the rural areas are not known	Confirm the service levels of the primary schools in the rural areas.	WSDP	No	TWK2526005	Service Level Survey of primary schools in the rural areas	R100	Yes	No	No
Topic 3: Water Services Asset Management (Infrastructure)										
3.1	Capacities of existing bulk water and sewer pipelines are inadequate.	Ensure adequate bulk water and sewer pipeline capacity, in order to increase assurance of water supply and to provent any possible sewage spillages.	MTREF Project	Yes	TWK2526006	Upgrading of Grabouw Gypsy Queen Bulk Sewer and Water Provision	R10 793	Yes	Yes	Yes
3.2	Capacity of existing WWTW is inadequate to meet future wastewater treatment requirements	Ensure adequate wastewater treatment capacity and final effluent compliance.	MTREF Project	Yes	TWK2526007	Grabouw WWTW upgrade	R2 199	No	Yes	Yes
3.3	Capacity of existing WWTW is inadequate to meet future wastewater treatment requirements	Ensure adequate wastewater treatment capacity and final effluent compliance.	MTREF Project	Yes	TWK2526008	Caledon WWTW upgrade	R1 000	No	Yes	Yes
3.4	Capacity of existing WWTW is inadequate to meet future wastewater treatment requirements	Ensure adequate wastewater treatment capacity and final effluent compliance.	MTREF Project	Yes	TWK2526009	Riviersonderend WWTW upgrade Phase 1	R13 481	Yes	Yes	Yes
3.5	Capacity of existing WWTW is inadequate to meet future wastewater treatment requirements	Ensure adequate wastewater treatment capacity and final effluent compliance.	MTREF Project	Yes	TWK2526010	Greyton WWTW upgrade	R2 609	Yes	Yes	Yes
3.6	Capacity of existing WWTW is inadequate to meet future wastewater treatment requirements	Ensure adequate wastewater treatment capacity and final effluent compliance.	MTREF Project	Yes	TWK2526011	Bot River WWTW upgrade	R35 247	Yes	Yes	Yes
3.7	Existing reservoir storage capacity is not adequate.	Ensure 48hrs AADD storage capacity for all towns.	MTREF Project	Yes	TWK2526012	Grabouw WEST bulk supply upgrades Steenbras upper: New 6.5 Ml reservoir	R15 714	Yes	Yes	Yes
3.8	Existing reservoir storage capacity is not adequate.	Ensure 48hrs AADD storage capacity for all towns.	MTREF Project	Yes	TWK2526013	Villiersdorp Destiny Farm Reservoir	R977	Yes	Yes	Yes
3.9	Capacity of WTW is not adequate	Ensure adequate future water treatment capacity and water quality compliance.	MTREF Project	Yes	TWK2526014	Upgrade of Villiersdorp WTW	R17 551	Yes	Yes	Yes
3.10	Capacity of WTW is not adequate	Ensure adequate future water treatment capacity and water quality compliance.	MTREF Project	Yes	TWK2526015	Upgrade of Riviersonderend Ultra Filtration Plant	R2 743	Yes	Yes	Yes
3.11	Capacity of WTW is not adequate	Ensure adequate future water treatment capacity and water quality compliance.	MTREF Project	Yes	TWK2526016	Upgrading of the Ultra Filtration Plant in Genadendal	R2 609	Yes	Yes	Yes
Topic 4: Water Services Operation and Maintenance										
4.1	Water Safety Plan not regularly updated.	Water Quality Risk Management - Regular updating of Water Safety Plans	WSDP	Yes	TWK2526017	Regular updating of the Water Safety Plans	R250	Yes	Yes	Yes
4.2	W_2RAP not regularly updated.	Wastewater Risk Management - Regular updating of W_2RAPs	WSDP	Yes	TWK2526018	Regular updating of the W_2RAPs	R250	Yes	Yes	Yes
4.3	WTW and WWTW Process Audits not regularly done.	Compile regular WTW and WWTW Process Audits (Every three years)	WSDP	Yes	TWK2526019	WTW and WWTW Process Audits	R350	Yes	Yes	Yes
4.4	Asset Management Plan is not in place.	Ensure sufficient budget allocation toward refurbishment of existing water and sewerage infrastructure.	WSDP	No	TWK2526020	Compile an Asset Management Plan	R850	Yes	No	No
4.5	All of the required O&M Schedules and checklists are not in place for all the water and sewerage infrastructure.	Ensure required O&M Schedules and Checklists are in place for all water and sewerage infrastructure components.	WSDP	No	TWK2526021	Compile required O&M Schedules for all water and sewerage infrastructure	R250	Yes	No	No
4.6	Some of the components of the Riviersonderend WTW need to be refurbished	Refurbishment / replacement of some of the Riviersonderend WTW's components	WSDP	No	TWK2526022	Refurbishment of the Riviersonderend WTW	R1 500	Yes	No	No
4.7	Some of the components of the Grabouw WTW need to be refurbished	Refurbishment / replacement of some of the Grabouw WTW's components	WSDP	No	TWK2526023	Refurbishment of the Grabouw WTW	R7 500	Yes	No	No
4.8	Security fencing at some of the reservoirs is inadequate	Improved security fencing at some of the reservoirs	WSDP	No	TWK2526024	New security fencing at some of the reservoirs	R3 900	Yes	No	No
4.9	Security measures at some of the water pump stations are inadequate	Improved security measures at some of the water pump stations	WSDP	No	TWK2526025	Improved security measures at some of the water pump stations	R726	Yes	No	No
4.10	Security fencing at some of the WTWs is inadequate	Improved security fencing at some of the WTWs	WSDP	No	TWK2526026	Improved securing fencing around some of the WTWs	R5 265	Yes	No	No
4.11	Security fencing at some of the sewer pump stations is inadequate	Improved security fencing at some of the sewer pump stations	WSDP	No	TWK2526027	Improved security fencing at some of the sewer pump stations	R1 350	Yes	No	No
4.12	Security fencing at some of the WWTWs is inadequate	Improved security fencing at some of the WWTWs	WSDP	No	TWK2526028	Improved security fencing at some of the WWTWs	R5 000	Yes	No	No
4.13	Various components of the WWTWs need to be refurbished	Refurbishment / replacement of some of the WWTW's components	WSDP	No	TWK2526029	Refurbishment required at some of the WWTWs	R20 000	Yes	Partially	Partially
Topic 5: Conservation and Demand Management (Topic 5.1 Water Resources)										
5.1	WC/WDM measures need to be implemented to further reduce NRW and Water	Implementation of WC/WDM Strategy measures	WSDP	No	TWK2526030	Implement propopsed WC/WDM Strategy measures as included in WSDP (1-3 yrs)	R16 938	Yes	Partly	Partly
5.2	WC/WDM measures need to be implemented to further reduce NRW and Water	Implementation of WC/WDM Strategy measures	WSDP	No	TWK2526031	Implement propopsed WC/WDM Strategy measures as included in WSDP (4-7 yrs)	R17 438	Yes	Partly	Partly
5.3	WC/WDM measures need to be implemented to further reduce NRW and Water	Implementation of WC/WDM Strategy measures	WSDP	No	TWK2526032	Implement propopsed WC/WDM Strategy measures as included in WSDP (8-10 yrs)	R11 388	Yes	Partly	Partly
Topic 5: Conservation and Demand Management (Topic 5.2 Water Balance)										
5.4	Older meters are less accurate and need to be replace, also faulty water meters.	Ensure all water usage is accurately metered, reduced NRW and Water Losses	MTREF Project	Yes	TWK2526033	Smart Meter Replacements	R5 000	Partially	Yes	Yes
Topic 6: Water Resources										
6.1	Groundwater monitoring programme not yet fully implemented	Implement a groundwater monitoring programme for all production boreholes.	WSDP	No	TWK2526034	Implement groundwater monitoring programme	R500	Yes	Yes	Yes
6.2	Not all industrial consumers are monitored with regard to the quality of effluent discharged into the Mun.'s sewer system.	Identify all wet industrial consumers and monitor the quality of industrial effluent discharged into the Mun.'s sewer system	WSDP	Yes	TWK2526035	Industrial effluent monitoring	R500	Yes	Yes	Yes
6.3	Existing water quality operational sampling programme not yet fully comply with SANS241:2015 requirements.	Ensure water quality operational sampling programme comply with SANS241:2015 requirements.	WSDP	Yes	TWK2526036	Increase water quality operational sampling programme	R200	Yes	Yes	Yes
6.4	Existing operational sampling programme at WWTWs not yet adequate to ensure proper process control.	Increase operational sampling programme at WWTW to ensure proper process control.	WSDP	Yes	TWK2526037	Increase effluent operational sampling at WWTWs	R200	Yes	Yes	Yes
6.5	The existing lawful use for all towns not yet known.	Confirm the existing lawful use and registration volumes for all towns.	WSDP	Yes	TWK2526038	Confirm existing lawful use and registration volumes for all towns.	R250	Yes	Yes	Yes
Topic 7: Financial										
	Done by other Department									
Topic 8: Institutional Arrangements and Customer Care										
	Done internally through O&M Budget									
TOTAL: CURRENT NEEDS							**R271 973**			
	Funded						**R109 922**			
	% Funded						**40%**			

Table F.1: WSDP FY2025/26: LIST OF CONCEPTUAL PROJECTS

Nr	Situation Assessment (Problem Definition)	Solution description as defined by topic situation assessment (Strategy)	Conceptual project	Is there an existing project addressing this problem?	Existing Projects Information			Does this current listed project address the problem totally?	Approved by Council, in project database and part of 5 year IDP cycle projects?	Project listed in 3yr MTEF - cycle?
					Project Number (Dept)	Project Title	Project Cost R'000			
FUTURE NEEDS										
Infrastructure										
F.1	Inadequate capacity of existing bulk water pipelines to meet future requirements.	Ensure adequate bulk water pipeline capacity to meet future requirements.	Water Master Plan	No	TWK2526039	Future bulk water pipelines required for Bot River	R3 264	Yes	No	No
F.2			Water Master Plan	No	TWK2526040	Future bulk water pipelines required for Caledon	R14 776	Yes	No	No
F.3			Water Master Plan	No	TWK2526041	Future bulk water pipelines required for Grabouw	R22 053	Yes	No	No
F.4			Water Master Plan	No	TWK2526042	Future bulk water pipelines required for Greyton	R674	Yes	No	No
F.5			Water Master Plan	No	TWK2526043	Future bulk water pipelines required for Villiersdorp	R4 828	Yes	No	No
F.6	Inadequate capacity of existing water pump stations to meet future requirements.	Ensure adequate water pump capacity to meet future requirements.	Water Master Plan	No	TWK2526044	Future water pump stations required for Bot River	R11 515	Yes	No	No
F.7			Water Master Plan	No	TWK2526045	Future water pump stations required for Caledon	R3 981	Yes	No	No
F.8			Water Master Plan	No	TWK2526046	Future water pump stations required for Grabouw	R14 260	Yes	No	No
F.9			Water Master Plan	No	TWK2526047	Future water pump stations required for Villiersdorp	R5 414	Yes	No	No
F.10	Existing reservoir storage capacity is inadequate to meet future requirements.	Ensure adequate reservoir storage capacity to meet future requirements.	Water Master Plan	No	TWK2526048	Future reservoirs required for Bot River	R45 478	Yes	No	No
F.11			Water Master Plan	No	TWK2526049	Future reservoirs required for Caledon	R66 543	Yes	No	No
F.12			Water Master Plan	No	TWK2526050	Future reservoirs required for Greater Genadendal	R17 312	Yes	No	No
F.13			Water Master Plan	No	TWK2526051	Future reservoirs required for Grabouw	R45 216	Yes	No	No
F.14			Water Master Plan	No	TWK2526052	Future reservoirs required for Greyton	R11 534	Yes	No	No
F.15			Water Master Plan	No	TWK2526053	Future reservoirs required for Riviersonderend	R10 605	Yes	No	No
F.16			Water Master Plan	No	TWK2526054	Future reservoirs required for Tesselaarsdal	R4 260	Yes	No	No
F.17			Water Master Plan	No	TWK2526055	Future reservoirs required for Villiersdorp	R40 340	Yes	No	No
F.18	Inadequate capacity of existing water reticulation networks to meet future requirements.	Ensure adequate internal water reticulation capacity.	Water Master Plan	No	TWK2526056	Upgrade existing water reticulation network for Bot River	R46 347	Yes	No	No
F.19			Water Master Plan	No	TWK2526057	Upgrade existing water reticulation network for Caledon	R45 237	Yes	No	No
F.20			Water Master Plan	No	TWK2526058	Upgrade existing water reticulation network for Greater Genadendal	R20 568	Yes	No	No
F.21			Water Master Plan	No	TWK2526059	Upgrade existing water reticulation network for Grabouw	R68 699	Yes	No	No
F.22			Water Master Plan	No	TWK2526060	Upgrade existing water reticulation network for Greyton	R5 931	Yes	No	No
F.23			Water Master Plan	No	TWK2526061	Upgrade existing water reticulation network for Riviersonderend	R10 601	Yes	No	No
F.24			Water Master Plan	No	TWK2526062	Upgrade existing water reticulation network for Tesselaarsdal	R2 090	Yes	No	No
F.25			Water Master Plan	No	TWK2526063	Upgrade existing water reticulation network for Villiersdorp	R25 177	Yes	No	No
F.26	Capacity of existing sewer pump stations is inadequate to meet future requirements	Ensure adequate sewer pump station capacity.	Sewer Master Plan	No	TWK2526064	Future sewer pump stations required for Bot River	R1 952	Yes	No	No
F.27			Sewer Master Plan	No	TWK2526065	Future sewer pump stations required for Caledon	R726	Yes	No	No
F.28			Sewer Master Plan	No	TWK2526066	Future sewer pump stations required for Greater Genadendal	R1 871	Yes	No	No
F.29			Sewer Master Plan	No	TWK2526067	Future sewer pump stations required for Grabouw	R4 592	Yes	No	No
F.30			Sewer Master Plan	No	TWK2526068	Future sewer pump stations required for Riviersonderend	R3 065	Yes	No	No
F.31			Sewer Master Plan	No	TWK2526069	Future sewer pump stations required for Villiersdorp	R889	Yes	No	No
F.32	Inadequate capacity of bulk sewer pipelines and sewer drainage network capacity to meet future requirements.	Ensure adequate bulk sewer pipeline and internal sewer drainage capacity.	Sewer Master Plan	No	TWK2526070	Future bulk sewer pipeline and sewer drainage network required for Bot River	R55 461	Yes	No	No
F.33			Sewer Master Plan	No	TWK2526071	Future bulk sewer pipeline and sewer drainage network required for Caledon	R63 181	Yes	No	No
F.34			Sewer Master Plan	No	TWK2526072	Future bulk sewer pipeline and sewer drainage network required for Greater Genadendal	R36 102	Yes	No	No
F.35			Sewer Master Plan	No	TWK2526073	Future bulk sewer pipeline and sewer drainage network required for Grabouw	R78 105	Yes	No	No
F.36			Sewer Master Plan	No	TWK2526074	Future bulk sewer pipeline and sewer drainage network required for Greyton	R42 922	Yes	No	No
F.37			Sewer Master Plan	No	TWK2526075	Future bulk sewer pipeline and sewer drainage network required for Riviersonderend	R9 477	Yes	No	No
F.38			Sewer Master Plan	No	TWK2526076	Future bulk sewer pipeline and sewer drainage network required for Tesselaarsdal	R11 578	Yes	No	No
F.39			Sewer Master Plan	No	TWK2526077	Future bulk sewer pipeline and sewer drainage network required for Villiersdorp	R36 339	Yes	No	No
F.40	Inadequate capacity of existing WTW and water quality failures.	Upgrade WTW to meet future requirements and ensure water quality compliance.	WSDP	No	TWK2526078	Upgrade Bot River WTW, additional 0.500 Ml/d treatment capacity (Total 2.100 Ml/d).	R12 500	Yes	No	No
F.41			WSDP	No	TWK2526079	Upgrade Genadendal WTW, additional 0.950 Ml/d (Total 1.250 Ml/d)	R23 750	Yes	No	No
F.42			WSDP	No	TWK2526080	Upgrade Voorstekraal WTW, additional 0.050 Ml/d (Total 0.400 Ml/d)	R1 250	Yes	No	No
F.43			WSDP	No	TWK2526081	Upgrade Grabouw WTW, additional 3.000 Ml/d (Total 18.000 Ml/d)	R75 000	Yes	No	No
F.44			WSDP	No	TWK2526082	Upgrade Greyton WTW, additional 1.0 Ml/d treatment capacity (Total 1.674 Ml/d)	R25 000	Yes	No	No
F.45	Inadequate capacity of existing WWTW and effluent quality failures.	Upgrade WWTW to meet future requirements and ensure water quality compliance.	WSDP	No	TWK2526083	Bot River Upgrade of WWTW, additional 0.5 Ml/d	R15 000	Yes	No	No
F.46			WSDP	No	TWK2526084	Caledon Upgrade of WWTW (First Phase), additional 1.7 Ml/d	R51 000	Yes	No	No
F.47			WSDP	No	TWK2526085	Caledon Upgrade of WWTW (Second Phase), additional 1.0 Ml/d	R30 000	Yes	No	No
F.48			WSDP	No	TWK2526086	Genadendal Upgrade of WWTW, additional 0.2 Ml/d	R6 000	Yes	No	No
F.49			WSDP	No	TWK2526087	Grabouw Upgrade of WWTW (First Phase), additional 4.0 Ml/d	R120 000	Yes	No	No
F.50			WSDP	No	TWK2526088	Grabouw Upgrade of WWTW (Second Phase), additional 5.5 Ml/d	R165 000	Yes	No	No
F.51			WSDP	No	TWK2526089	Greyton Upgrade of WWTW, additional 0.3 Ml/d	R9 000	Yes	No	No
F.52			WSDP	No	TWK2526090	Riviersonderend Upgrade of WWTW (Second Phase), additional 0.5 Ml/d	R15 000	Yes	No	No
F.53			WSDP	No	TWK2526091	Villiersdorp Upgrade of WWTW (First Phase), additional 1.0 Ml/d	R30 000	Yes	No	No
F.54			WSDP	No	TWK2526092	Villiersdorp Upgrade of WWTW (Second Phase), additional 1.5 Ml/d	R45 000	Yes	No	No
Resources										
F.55	Supply from current boreholes is inadequate to meet future water requirments	Development of an additional two production boreholes	WSDP	No	TWK2526093	Augmentation of groundwater sources for Bot River	R3 000	Yes	No	No
F.56	Only one production borehole	Development of one additional production borehole	WSDP	No	TWK2526094	Additional borehole for Tesselaarsdal	R1 500	Yes	No	No
F.57	Supply from surface water sources is inadequate to meet future water requirements	Ensure adequate supply from sources to meet future water requirements	WSDP	No	TWK2526095	Augmentation of groundwater sources for Villiersdorp	R5 000	Yes	No	No
F.58	Supply from Riviersonderend is inadequate to meet future raw water requirements	Ensure adequate supply from sources to meet future water requirements	WSDP	No	TWK2526096	Refurbishment of bulk raw water supply pipeline for Riviersonderend (Olifantsbos)	R7 500	Yes	No	No
TOTAL: FUTURE NEEDS							**R1 533 463**			