



CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD



Long-term water conservation and water demand management strategy

From water scarcity to water security. Making Cape Town a water-efficient city.
(2025)

Making progress possible. Together.

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List of acronyms

AADD	annual average daily demand	O&M	operation and maintenance
AMI	advanced metering infrastructure	PPP	public-private partnership
AR	augmented reality	PRV	pressure reducing valve
DMA	district metered areas	SALGA	South African Local Government Association
DWS	Department of Water and Sanitation	SAP PPM	SAP project portfolio management
E&AM	Engineering and Asset Management	SDBIP	Service Delivery and Budget Implementation Plan
ILI	infrastructure leakage index	SIV	system input volume
JASWIC	Joint Acceptance Scheme for Water Installation Components	ToR	terms of reference
Kℓ/day	kilolitres per day	VR	virtual reality
Kℓ/month	kilolitres per month	W&S	Water and Sanitation
KPI	key performance indicator	WC	Water Conservation
LOS	level of service	WC/WDM	Water Conservation and Water Demand Management
l/c/d	litres per capita per day	WCWSS	Western Cape Water Supply System
l/s	litres per second	WDM	Water Demand Management
m³/s	cubic metres per second	WDM,R&P	Water Demand Management, Regulation and Planning Branch
MIS	management information system	WSA	water services authority
Mℓ/day	megalitres per day	WSDP	Water Services Development Plan
Mm³/a	million cubic metres per annum	WSI	water services institution
NDP	National Development plan	WTW	water treatment works
NRW	non-revenue water	WWTW	wastewater treatment works
NWA	National Water Act, 1998 (Act 36 of 1998)		
NWRS3	National Water Resource Strategy 3		

Definitions

Advanced metering infrastructure (AMI)

Means a system of smart meters and associated infrastructure that uses computer networks to collect, analyse and transmit data in near real-time.

Apparent losses or commercial losses

Means all unauthorised consumption (theft or illegal use) as well as all technical and administrative inaccuracies associated with customer metering and billing.

Authorised consumption

Means the volume of metered and unmetered water used by registered customers, the City and others who are implicitly or explicitly authorised to do so by the City for residential, commercial and industrial purposes.

Billed authorised consumption

Means the revenue water and is calculated as the volume of authorised metered and unmetered consumption that is billed by the City and paid for by the customer.

City

Means the City of Cape Town, a municipality established by the City of Cape Town Establishment Notice No. 479 of 22 September 2000, issued in terms of the Local Government: Municipal Structures Act, 1998 (Act 117 of 1998), or any structure or employee of the City acting in terms of delegated authority.

Climate change

Means a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere, and that is, in addition to natural climate variability, observed over comparable time periods.

Climate variability

Means variation in the mean state and other statistics (such as standard deviation, the occurrence of extremes, etc.) of the climate on all spatial and temporal scales beyond that of individual weather events.

Demand-side management

Means any measure or initiative that will result in the reduction in expected water usage or water demand.

Free basic water

The volume of authorised consumption, which is billed at a zero rate and represents free basic water.

Inefficient use of water

Means water used for a specific purpose over and above the accepted and available best practices and benchmarks, or water used for a purpose where very little benefit is derived from it.

Infrastructure leakage index (ILI)

The infrastructure leakage index is a performance indicator used to measure the extent of leakage in a particular system.

Integrated water resource planning

Means analysing the change in supply, demand and operation of water supply systems and evaluating a variety of supply-side and demand-side management measures to reconcile the available supply and demand.

International Water Association (IWA) water balance

The International Water Association water balance is a framework used to quantify water supply components and analyse water losses in water distribution systems. It involves calculating system input volume (the total water supplied) and then breaking it down into revenue water (billed authorised consumption) and non-revenue water (NRW). NRW is further categorised into real losses (leakages), apparent losses (meter errors, theft), and unbilled authorised consumption (firefighting).

Long-run marginal cost

Means the average incremental cost of system expansion, taking into account the next large scheme or schemes to be built to meet the current and future demand.

Minimum night flow

The minimum night flow is the lowest flow entering a water supply area during a 24-hour period, which usually occurs between 00:00 and 04:00 when the consumption in the network is at its lowest (as most people are asleep).

Non-revenue water

The volume of water supplied by the City for which the City receives no income. It is calculated as the difference between the volume of water supplied into the system and the billed authorised consumption.

Real losses

Means physical water losses made up of leakage (from mains, services connections up to the point of consumption and reservoirs) and overflows (mainly from reservoirs).

Reticulation management

Means any function relating to the management, maintenance and operation of any system of structures, pipes, valves, pumps, meters or other associated equipment, including all mains, connection pipes and water installations that are used or intended to be used in connection with the supply of water.

Retrofitting

Means the modification, adaptation or replacement of an existing device, fitting or appliance.

Service connections

Means a leading pipe from the mains to the customer meter.

Supply-side management

Means any measure or initiative that will increase the capacity of a water resource or water supply system to supply water.

System input volume (SIV)

The potable volume input to the water supply system from the City's and National W&S sources, as measured

at the water treatment works (WTW) outlet as well as any water imported from other sources.

Unavoidable annual real losses (UARL)

This represents the minimum level of real losses for a specific system that can be reached under the most efficient operating conditions.

Unbilled authorised consumption

The volume of authorised metered and unmetered consumption that is not billed or paid for.

Water conservation

Means the minimisation of loss or waste, care and protection of water resources and the efficient and effective use of water.

Water demand management

Means the adoption and implementation of a strategy by a water institution or consumer to influence the water demand and usage of water to meet any of the following objectives: economic efficiency, social development, social equity, environmental protection, sustainability of water supply and services, and political acceptability.

Water institutions

Means both water management institutions and water services institutions as defined in the National Water Act, 1998 (Act 36 of 1998) and the Water Services Act, 1997 (Act 108 of 1997), respectively.

Water losses

Means the difference between the measured volume of water supplied and the total volume of water measured to authorised consumers whose connection may be metered, unmetered, billed or unbilled.

Water wastage

Means water lost through leaks or water usage, which does not result in any direct benefit to a consumer or user.



Executive summary

Introduction

The availability of water resources, along with adequate bulk water and wastewater infrastructure to meet the City of Cape Town's (City's) growing water demand, is a limiting factor in the City's social upliftment and economic prosperity. Nevertheless, the City has made tremendous progress in addressing this constraint. The City's 2007 Water Conservation and Water Demand Management (WC/WDM) Strategy highlighted that as early as 1995, the City committed to a 10% saving on the historical demand growth of 4% per annum. An Integrated Water Resource Planning study carried out in 2001 also indicated that various WC/WDM initiatives are the most feasible means of extending resources to meet the growing water demand for the City. Several WC/WDM projects were implemented and some of the projects, such as the Khayelitsha and Mitchells Plain pressure management project, were very successful and received wide recognition. This revised WC/WDM Strategy seeks to overcome institutional challenges, build on experience gained and adapt the City's approach to align with current socio-political, environmental and urban management imperatives.

The purpose of this updated WC/WDM Strategy is to highlight and ensure the long-term balance between available water resources and water demand, to achieve equity and redistribution of our water resources, to ensure water security for the future, to ensure enough water for our national economic growth, and to ensure water use efficiency. This WC/WDM Strategy will be key to the successful implementation of the Water Strategy (2019).

This strategy is the City's overarching strategy for Water Conservation and Water Demand Management. Several substrategies and plans are derived from this strategy, including:

- The Treated Effluent Strategy and Masterplan for non-potable reuse in City of Cape Town (2021);
- The Meter Replacement Programme; and
- The Infrastructure Asset Management Plan: Pipe Replacement Programme.

This document consists of four sections:

Section A: Provides background to the strategy and describes the City's current WC/WDM situation.

Section B: Evaluates the benefits of WC/WDM and outlines the scope of the strategy.

Section C: Describes the framework of action to be implemented, divided into three components:

- Goals;
- Implementation objectives and action plan; and
- Enabling objectives and action plan to facilitate and ensure implementation.

Section D: Outlines the approach to monitoring and evaluation.

Need for WC/WDM

Effective WC/WDM is a long-term solution to:

- a. Ensure that the City achieves the long-term water resource strategy goals by reconciling the water supply and water demand;
- b. Protect our water resources and environment by limiting the water abstracted from rivers, reducing the pollution discharged through the wastewater system and reducing the pollution from contaminating the water supply;

- c. Ensure the financial viability of the City's water services by:
 - Reducing the direct operating costs through a reduction in non-revenue water (NRW);
 - Increasing income from consumers through more equitable and affordable tariffs;
 - Increasing income by billing existing and potential paying customers for actual consumption; and
 - Deferring unnecessary implementation of capital water infrastructure by reducing water losses.
- d. Assist in alleviating the challenges of excessive inflows into the wastewater system. The wastewater treatment system in the City is under severe stress due to lack of capacity. There are a number of treatment plants where hydraulic loading is the key constraint and WC/WDM can play a significant role in alleviating problems and reducing costs.
- g. Unpredictable and unmanageable increase in consumption components such as domestic, non-domestic, informal settlement and unbilled/informal usage due to population growth.

Opportunity of reducing wastage and increasing efficiency

Through WC/WDM and during periods of drought, the City managed to limit water demand growth to 0,13% per annum over a period of more than 20 years, despite the population growing by 78% in the same period.

From the demand analysis and consultations, the implementation of this WC/WDM Strategy could achieve the following by 2034/35:

1. Reduce total water demand by up to **90 Mℓ/day** through a combination of interventions:
 - 1.1. Reduce physical water losses by up to **68,5 Mℓ day**;
 - 1.2. Reduce inefficiencies by up to **5,5 Mℓ/day**; and
 - 1.3. Through expansion of the treated effluent supply schemes, contribute to potable water demand reduction by approximately **16 Mℓ/day** (treated effluent-direct potable offset), and supply an additional 50 Mℓ/day effluent reuse and other alternative water sources for non-potable reuse.
2. Reduce commercial water losses to increase revenue water by up to **16 Mℓ/day**.
3. Reduce and maintain the average consumption at **150 l/c/d**.
4. Prevent exacerbated, unavoidable physical water losses and the natural rate of rise in leakage beyond the current estimate of **40 Mℓ day (4%) of the SIV**.

The City cannot achieve its WC/WDM objectives through capital investment alone. It is essential that interventions are complemented by measures that build public understanding of water-saving practices, raise awareness of the importance of conservation, and ensure effective enforcement of relevant City by-laws. These measures are integral to realising the goals outlined in this strategy.

Consequences of not implementing WC/WDM in the City

The consequences of not implementing the entire WC/WDM strategy can be significant and will depend on the extent of implementation. Some of the important consequences are as follows:

- a. The NRW percentage and volume will continue to increase;
- b. The City's lost income due to NRW will continue to increase;
- c. The aim of achieving sustainable and affordable service delivery could be threatened;
- d. The amount of water loss will continue to increase;
- e. Water distribution infrastructure may fail prematurely resulting in an increase in NRW and unplanned capital and operating budget requirements;
- f. Unavoidable leaks from the distribution system will increase beyond the current 40 Mℓ/day estimate (4% of the supplied volume);

Framework of action

The City has made significant progress in improving water use efficiency and reducing demand. The guiding principle behind the City's updated goals is to minimise water losses, optimise the efficiency of water use, and manage overall water demand – despite ongoing population and economic growth in Cape Town.

The updated Water Conservation and Water Demand Management (WC/WDM) Strategy will allow the City to strengthen existing initiatives and introduce new measures aligned with its evolving needs.

Goals A, B and E relate to the implementation objectives that will result in the direct reduction of water demand. Fifteen implementation objectives have been developed under these goals.

These objectives are illustrated in the table below.

- **Goal A:** The City must by 2034/35 reduce and maintain the NRW by volume to below 20% of water supplied, from 27,1% (2023/24).
- **Goal B:** The City must by 2034/35 reduce and maintain water consumption to below 150 l/c/d of total potable water supplied, from 157 l/c/d (2023/24).
- **Goal E:** The City must by 2034/35 reduce and maintain the projected potable water demand to an average growth rate of between 1% and 1,5% p.a. (assuming a population growth rate between 1,6% and 2% p.a.)

Table 1: Implementation of water demand reduction objectives

Policy	Objective number	Description
Goal A Nrw < 20%	A1	Reduce and maintain low levels of water losses through the reticulation system
	A2	Reduce and maintain low levels of non-revenue demand by consumers
	A3	Adopt and implement proactive operation and maintenance (O&M) measures
	A4	Reduce and maintain low levels of billing and metering losses
	A5	SIV verification
Goal B l/c/d < 150	B1	Promote the efficient use of water to consumers and customers
	B2	Regulate and enforce the prevention of wastage of water
	B3	Ensure the efficient use of water in new connections and developments
	B4	Maintain equitable tariffs and informative billing
	B5	Assist and capacitate consumers to be water efficient, including the introduction of leak repair and retrofitting projects
	B6	Reduce and maintain low levels of inefficient water use by Council
Goal E Average growth between 1% and 1,5%	E1	Maximise the use of treated effluent
	E2	Promote alternative water resources and technologies for non-potable purposes
	E3	Conservation of existing water resources
	E4	Ensure the quality of treated effluent is of suitable standards

The enabling action plan consists of two goals and seven objectives as illustrated in the table below. Goal C relates to ensuring adequate information and Goal D relates to ensuring adequate resources and capacity to implement WC/WDM.

- **Goal C:** The City must ensure and maintain ongoing, effective management systems and water use efficiency measures.
- **Goal D:** The City must maintain WC/WDM as one of the key water service delivery strategies, and must give priority to its implementation and ensure an ongoing, adequate enabling environment.

Table 2: Enabling WC/WDM objectives

Policy	Objective number	Description
Goal C	C1	Appropriate district management areas and monitor district metered areas (DMA) water balances
	C2	Ensure adequate information and policies to support decision making
	C3	Monitor the impact of WC/WDM measures and key performance indicators (KPIs)
Goal D	D1	Ensure adequate financial resources
	D2	Ensure adequate human resources and processes

WC/WDM budget

The City requires R14,7 billion in WC/WDM initiatives over the next 10 years to enhance water use efficiency and achieve the objectives set in this strategy.

The proposed budget allocation for WC/WDM over the next 10 years, starting in the 2025/26 financial year, is as follows:

Table 3: Overall budget for WC/WDM (R million)

Financial year	WC/WDM CAPEX budget required	WC/WDM OPEX budget required	Total WC/WDM budget required	WC/WDM CAPEX budget planned (SAP PPM)	WC/WDM budget shortfall
2025/26	932,17	131,27	1 063,45	748,67	314,78
2026/27	1 198,12	264,24	1 462,35	1 017,30	445,05
2027/28	1 193,39	286,81	1 480,19	905,76	574,44
2028/29	1 162,35	292,39	1 454,74	790,59	664,15
2029/30	1 052,14	308,62	1 360,76	768,29	592,47
2030/31	1 093,46	342,72	1 436,17	731,18	704,99
2031/32	1 125,79	360,20	1 486,00	661,30	824,70
2032/33	1 203,46	378,45	1 581,91	698,00	883,91
2033/34	1 264,25	406,15	1 670,41	730,30	940,11
2034/35	1 309,44	440,21	1 749,65	922,95	826,70
Total	11 534,57	3 211,05	14 745,63	7 974,33	6 771,30

The columns indicate the capital and operating budget required to implement the interventions outlined in this document.

WC/WDM is not a new programme in the City (see subsection 3.3). The ongoing interventions have been assigned budget aligned with the current resource limitations ('WC/WDM CAPEX budget plan (SAPPM)'). Approximately R8 billion has been planned for capital projects for the WC/WDM programme over the next 10 years. However, this revised strategy will require additional capital and operating budget allocations to achieve and maintain its stated objectives. The 'WC/WDM budget shortfall' column indicates the annual shortfall (the difference between column 3 and column 4). The City must allocate an additional R6,7 billion to WC/WDM interventions over the next 10 years to ensure that the objectives and targets set in this strategy are achieved.

The potential savings are proportional to the budget required to implement new interventions and maintain the existing water distribution network. It is expected that only 55% of the savings will be achieved if the 45% budget shortfall cannot be funded. Interventions will be prioritised, as described in this document, and it is expected that the pipe replacement (R4,5 billion) and consumer meter (AMI) (R4 billion) programmes would be most affected by the budget shortfall.

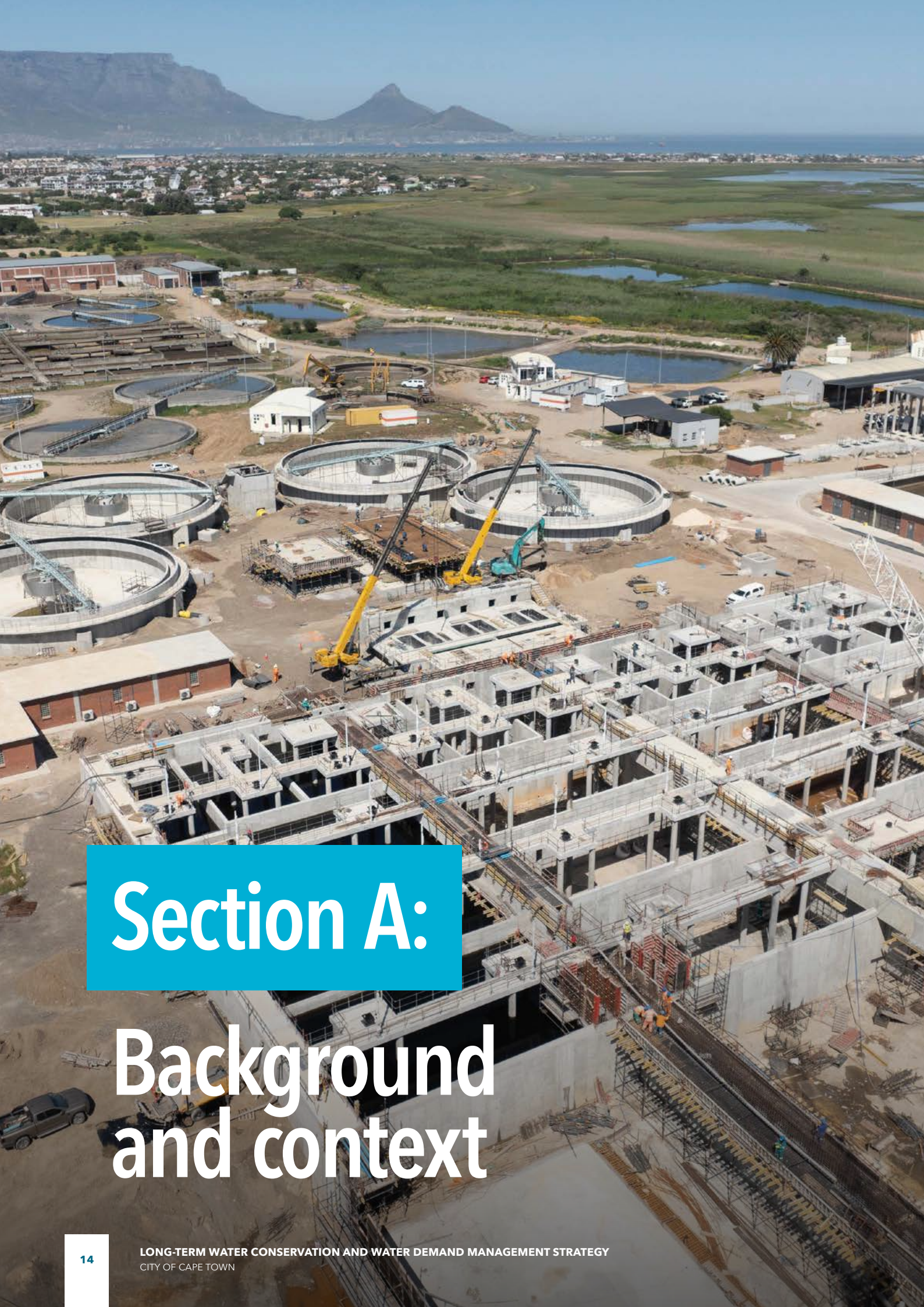
Conclusion

To prevent the increase in NRW and to ensure water use efficiency, the City has no choice but to prioritise and implement this WC/WDM Strategy. The available budget will have a direct impact on the extent to which the City can achieve the goals set out in this strategy.

Recommendations

The following are some of the key recommendations of the WC/WDM Strategy:

- The City must commit to fund, implement and maintain WC/WDM as a key strategy to ensure water security and financial sustainability.
- Attention should be given to address all the proposed WC/WDM-related programmes and projects described in this strategy.
- The proposed budget should be allocated to WC/WDM programmes over the next 10 years.
- WC/WDM activities should be integrated and monitored over the next 10 years to reduce NRW, account for all components on the City's water balance and maintain total water demand at acceptable levels.
- WC/WDM must form part of bulk supply planning to ensure resilience through drought.
- Use this strategy to motivate for capital and operating budget over the next 10 years.
- This strategy should be regularly reviewed to incorporate the latest available information and to reprioritise the implementation of various programmes.
- Periodic studies on water consumption patterns should be done to update key behavioural and other information for data driven decision making.
- Attention should be given to the human resource requirements to enable the successful implementation of this strategy.
- Ongoing wastewater treatment works upgrades must continue to improve effluent quality for effective implementation of the treated effluent masterplan for non-potable reuse.



Section A:

Background and context

1. Introduction

The City of Cape Town (City) is facing long-term water shortages, as well as severe capacity constraints on wastewater collection and treatment facilities, with concomitant increased levels of inland and coastal water pollution. In response, the City has adopted an integrated approach to water management, in line with the approach advocated by the National Water Resource Strategy (NWRS3), which seeks a balance between Water Conservation and Water Demand Management (WC/WDM) initiatives and conventional supply augmentation.

The concept and philosophy of water demand management have increased in prominence within the City since the mid-1990s, with two significant and severe water scarcity or drought events having taken place in the past 20 years.

Growth, development and the overall wellbeing of the City depends on its ability to manage this fragile resource, which has led to the adoption of a new theme in the updating of this strategy: **“From water scarcity to water security – making Cape Town a water-efficient City”**.

Since the implementation of the Water Strategy (2019), various capital investments to increase water supply have been initiated through the City’s New Water Programme. Nevertheless, the WC/WDM Strategy remains crucial to ensure that the City’s water resources are used wisely. As such, this strategy update focuses

on interventions that optimise water use efficiency and alternatives to offset the use of drinking water for non-potable purposes (e.g. treated effluent for non-potable use, spring water). This strategy contributes to ensuring that the current and new water sources are preserved in the long term. The strategy also seeks to instil a long-term ethic and culture of water use efficiency amongst all consumers of the City’s water, and to institutionalise WC/WDM within the Water and Sanitation Directorate. All end consumers who receive water services from the City should eventually be influenced by this strategy, including commercial, industrial and domestic consumers.

This strategy update covers a 10-year period (2025-2035) and provides guidance, direction and targets for WC/WDM in the City. This document replaces the City’s Water Demand Management Policy (2001), and Long-term WC/WDM Strategy (2007).

This strategy document consists of four sections:

Section A: Provides background to the strategy and describes the City’s current WC/WDM situation.

Section B: Evaluates the benefits of WC/WDM and outlines the scope of the strategy.

Section C: Describes the framework of action to be implemented.

Section D: Outlines the approach to monitoring and evaluation.

2. Strategic alignment

2.1. National legislation and strategies

This WC/WDM Strategy supports the key principles of equity, optimal use and sustainable use embodied in legislation and complies with the relevant provisions of national legislation and policy. The following is a list of all the relevant national legislation and policies regarding WC/WDM.

2.1.1. Constitution of the Republic of South Africa, 1996

The Constitution's Bill of Rights states every citizen's right to water security.

- **Section 27** addresses healthcare, food, water and social security. Specifically:
 1. 27(1)(b) Everyone has the right to have access to sufficient food and water; and
 2. The state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of each of these rights.

2.1.2. National Water Act, 1998 (Act 36 of 1998)

The National Water Act adopts water conservation as a key concept.

- **Section 8** makes water conservation one of the requirements of a catchment management strategy for the protection, use, development, conservation, management and control of water resources within its water management area.
- **Section 29** makes water conservation one of the conditions associated with authorisation of licences.
- **Section 56** specifies that the cost of water conservation can be included in the pricing strategy.
- **Schedule 3 Item 6** specifies that the catchment management agency may, in the case of a water shortage or potential water shortage, require users to undertake water conservation measures.

2.1.3. Water Services Act, 1997 (Act 108 of 1997)

The following sections in the Water Services Act relate directly to WC/WDM:

- **Section 2(j)** states that one of the main objectives of the Act is: "the promotion of effective water resource management and conservation".
- **Section 4(2)** requires that one of the conditions set by the water services provider must provide for measures to promote water conservation and demand management.
- **Section 11** specifies the duty of water service authorities to provide access to water services to all consumers subject to the duty to conserve water resources.
- **Section 13** specifies the contents of a draft water services development plan, which must include details of existing and proposed water conservation measures.

2.1.4. Water and Sanitation Services Standards

The revised Compulsory National Water and Sanitation Services Standards in terms of section 9 (1) of the Water Services Act, 1997 (Act 108 of 1997) were gazetted in 52814 of 6 June 2025, No 6292, for implementation. The revised norms and standards include the efficient and sustainable use of water, including WCWDM, and the nature, operation, sustainability, operational efficiency, and economic viability of water services.

2.1.5. National Development Plan (NDP)

The NDP recognises water as a strategic resource essential for social and economic development in South Africa, a water-scarce country. Recognising the growing risks of water scarcity, the NDP emphasises the need for effective WC/WDM to ensure affordable and reliable access to safe water and sanitation for all by 2030. The NDP underscores that sustainable economic growth requires prioritising water conservation across all sectors, particularly in water-dependent industries such as mining, agriculture and manufacturing. It proposes

a dedicated national WC/WDM programme with clear targets for municipalities, industry and agriculture.

2.1.6. National Water Resource Strategy 3 (NWR3)

The NWR3 was developed by the Department of Water and Sanitation (DWS) as a strategic framework that outlines a road map for managing the country’s water resources. The department’s major focus of the NWR3 is equitable and sustainable access and use of water by all South Africans while sustaining our water resource.

To achieve a balance between social equity, economic efficiency and environmental sustainability, the National Water Conservation and Water Demand Management Strategy was developed using the following three fundamental principles:

- Water institutions should endeavour to supply water in an efficient and effective manner by minimising water losses and promoting WC/WDM to their consumers.
- Consumers should endeavour to use water efficiently and minimise waste.
- WC/WDM is an integral part of the water resource planning processes and the implementation of WC/WDM measures could provide a more

cost-effective or appropriate solution to the reconciliation of the growing water demand on existing water resources or infrastructure.

2.1.7. Western Cape Water Supply System Reconciliation Strategy

The Western Cape Water Supply System (WCWSS) is the primary source of Cape Town’s water supply. The WCWSS Reconciliation Strategy, completed in 2008, and now updated on an ongoing basis (latest October 2024), is the current strategic water resource planning initiative being conducted jointly by the national DWS, the City and other stakeholders in the region. The objective of the WCWSS Reconciliation Strategy is to reconcile water demand with available supply, whilst taking into consideration climate change, population growth and infrastructure limitations.

WC/WDM is highlighted as a key initiative in the implementation of the WCWSS Reconciliation Strategy.

2.1.8. National and Water Services Sector WC/WDM strategies (2023)

The National and Water Services Sector WC/WDM strategies have the following main goals:

The National and Water Services Sector WC/WDM strategies main goals

Water conservation and water demand management has been effectively implemented across all water sector value chains thereby ensuring improved water use efficiency and ensuring the sustainable use of water resources into the future.			
GOAL 1: Improved leadership, institutions, and regulation Objective 1: To develop the institutional framework for WC/WDM Objective 2: To strengthen and develop improved legal and regulatory instruments	GOAL 2: Strengthened co-operative governance and strategic alignment Objective 3: To formalise inter-governmental frameworks to support integrated approaches and partnerships	GOAL 3: Enhanced operationalisation, implementation, and performance Objective 4: To engage and support the strategic development and improvement of sector infrastructure Objective 5: To support innovation and the use of technology through technical and financial backing Objective 6: To improve and sustain financial support for WC/WDM Objective 7: To enhance WC/WDM monitoring, reporting, and evaluation frameworks	GOAL 4: Mobilising the sector through strengthened capacity building, training, and awareness Objective 8: To strengthen the capacity of sector institutions to support implementation of WC/WDM Objective 9: To develop best practice guidelines and tools for the sectors Objective 10: To improve national awareness of the importance of WC/WDM

2.1.9. 'No Drop' Programme

The DWS developed the 'No Drop' Programme to draw attention to and encourage progress in water use efficiency and water loss (or NRW) management in the South African municipal sector.

A water services authority (WSA) is assessed according to the following criteria:

- **Strategy, planning and implementation:** The WSA must demonstrate a thorough understanding of its current situation regarding water use relative to its available resources and water use licences. It must present a workable Council-approved WC/WDM Strategy indicating how the WSA aims to achieve its own targets.
- **Asset management:** Water distribution infrastructure is to be managed in a manner that will ensure that WDM targets are met.
- **Technical skills:** The WSA must employ personnel sufficiently qualified to drive and to add impetus to its WC/WDM initiatives.
- **Credibility:** WC/WDM initiatives are developed based on data received from its network monitoring systems. Consumers also demand that the billing system employed results in billing that is consistently accurate.
- **Compliance and performance:** WC/WDM compliance and performance are measured against several best practice targets.
- **Local regulation:** Municipalities must apply themselves in their local authority roles as far as WC/WDM is concerned. It is expected that municipalities will use their authority to good effect to ensure that WDM receives sufficient attention by all who fall under the jurisdiction of the municipality.
- **Customer care:** The WSA will engage with its customers in a constructive manner to ensure that WDM targets are reached and sustained.

2.2. City strategies

2.2.1. Integrated Development Plan (IDP), 2022-2027

This WC/WDM Strategy is aligned with the following objectives in the City's IDP:

- **Objective 2:** Improved access to quality and reliable basic services. Reducing leaks in the network will improve the reliability of water services across the City. This strategy will also introduce customer-centric programmes to improve the customer experience.
- **Objective 4:** Well-managed and modernised infrastructure to support economic growth (4.3.A – Network management). This strategy supports the City's goal to repair and replace water infrastructure regularly and improve response times in repairing burst pipes. Effective network management will continue, using pressure management and leak detection to reduce water losses.
- **Objective 14:** A resilient city. A resilient city can withstand droughts and will mitigate risk by reducing dependence on surface potable water. The refined approach to water conservation, metering, pipe replacement and treated effluent expansion will support the city's resilience.

2.2.2. City of Cape Town Water Strategy (2019)

The City has five water commitments that are outlined in the Water Strategy (2019):

1. **Safe access to water and sanitation.** The City will work hard to provide and facilitate safe access to water and sanitation for all residents in terms of well-defined minimum standards.
2. **Wise use.** The City will promote the wise use of water by all water users.

3. **Sufficient, reliable water from diverse sources.**

The City will develop new diverse supplies of water that could include groundwater, water reuse and desalinated water cost effectively and timeously to increase resilience and substantially reduce the likelihood of severe water restrictions in future.

4. **Shared benefits from regional water resources.**

The City will work with key stakeholders and partners, including other urban and agriculture water users, and other spheres of government, to make the most of the opportunities to optimise the economic, social and ecological benefits of regional water resources, and to reduce the risks.

5. **A water-sensitive city.** The City will actively facilitate the transition of Cape Town over time into a water-sensitive city with diverse water resources, diversified infrastructure and one that makes optimal use of stormwater and urban waterways for the purposes of flood control, aquifer recharge, water reuse and recreation, and is based on sound ecological principles.

2.2.3. City of Cape Town Climate Change Strategy (2021) and Action Plan

The City's Climate Change Strategy commits to two key goals related to water resources:

- **Goal 3:** Reduce demand for water to protect water resources and ensure sustainability of supply.
- **Goal 4:** Work to augment and increase water supplies to achieve 99,5% assurance of supply.

The Climate Change Action Plan sets out specific actions to achieve these goals:

- **Action 3.1:** Continued implementation of the City's water conservation programme focused on demand-side management.
- **Action 4.1:** Augment Cape Town's water supply to ensure the long-term sustainability of supply.
- **Action 4.2:** Remove invasive alien plant species in water supply catchment areas and aquifer recharge areas, and in natural areas across the city.

2.2.4. City of Cape Town draft Long-term Plan (2025)

Informed by past shocks such as the 2015-2019 drought, Cape Town's draft Long-term Plan for 2050 emphasises the need for a WC/WDM Strategy as a core contributor to a resilient city. The plan addresses the dual challenge of supplying additional water to a growing population while simultaneously saving water through demand management interventions. To achieve this, it sets ambitious targets aligned with the City's Water Strategy. These goals are supported by key initiatives such as the 'Water for the future' initiative, which focuses on lifecycle asset management and the roll-out of smart water meters for better consumption monitoring. This is complemented by integrating nature-based solutions such as wetland restoration for aquifer recharge, comprehensive stormwater master planning, and intergovernmental collaboration to augment regional surface water supplies.

3. Context

3.1. Population growth and water demand

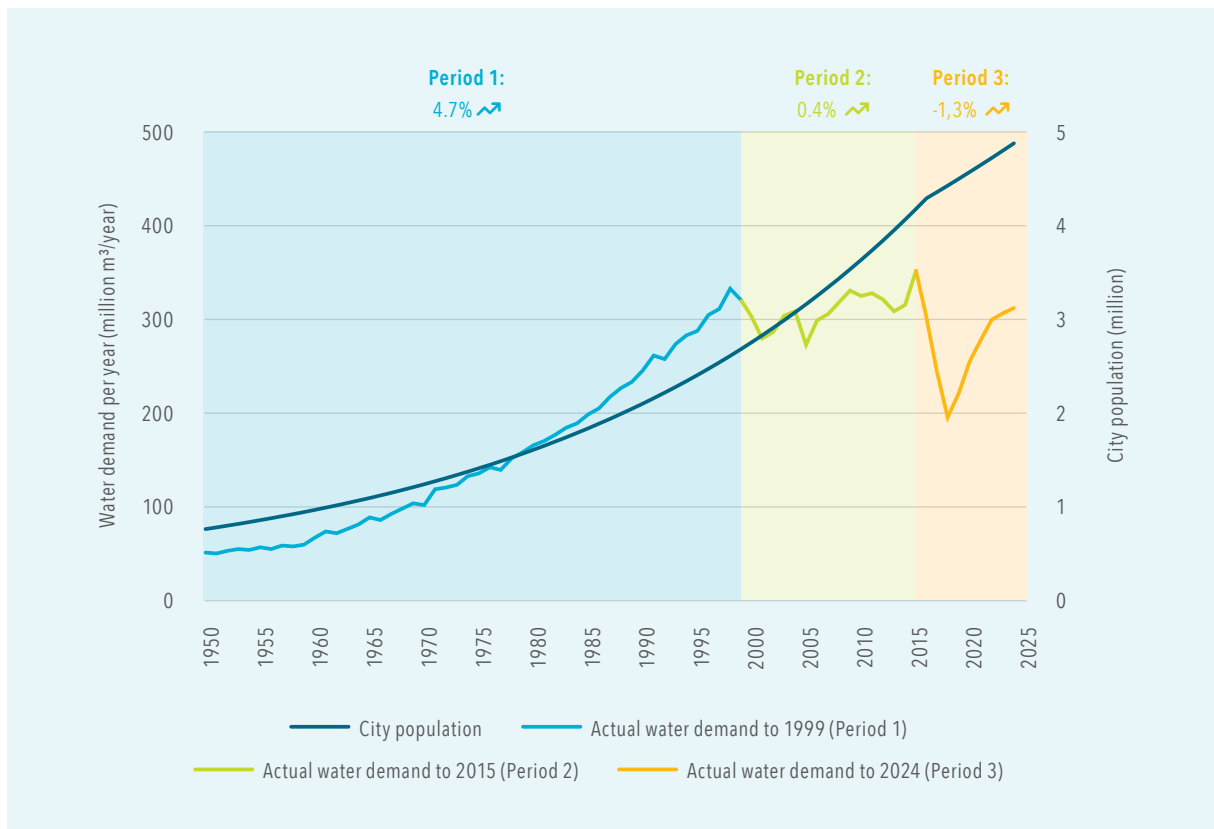
Like other metropolitan areas in South Africa, the City is experiencing rapid population growth and urbanisation. The City's population grew from approximately 2,9 million in 2001 to 4,9 million by 2024. At the same time, household size has decreased from an average of 3,7 members in 2001 to 3,3 in 2022, resulting in an increase in the number of households (City of Cape Town, 2022) and related demand for housing and services. Many new households reside in informal settlements or backyard dwellings, reflecting a growing demand for low-income housing and required associated water infrastructure. In 2022, approximately 19% of households were living in informal or backyard dwellings, highlighting the socio-economic challenges accompanying rapid urbanisation.

This population growth is fuelling urban sprawl and intensifying competition for the region's limited water resources. As a result, expanding Cape Town's water supply sources is crucial to being able to cater to the growing water needs of the population.

3.1.1. Current water demand

Cape Town's water use is on the rise following the severe drought in 2017/18. Although coming from a very low base, daily water demand has doubled since June 2018, reaching 1 000 million litres per day during the 2024 peak week. Since 1999, the City has achieved significant water savings through WC/WDM, with almost zero growth rate in water demand, whilst the population grew by 78% from 2,7 million to 4,9 million people.

Figure 1: City's historical water demand and population growth



3.2. Water supply situation

Cape Town is supplied by 14 dams with a collective capacity of approximately 900 000 Mℓ (900 000 000 000 litres). Most of this capacity is provided by six large dams: Theewaterskloof, Voëlvlei, Berg River, Wemmershoek, and the Steenbras Upper and Lower Dams. The remaining dams are much smaller and only contribute 0,4% to total capacity. The three largest dams are owned or managed by the DWS.

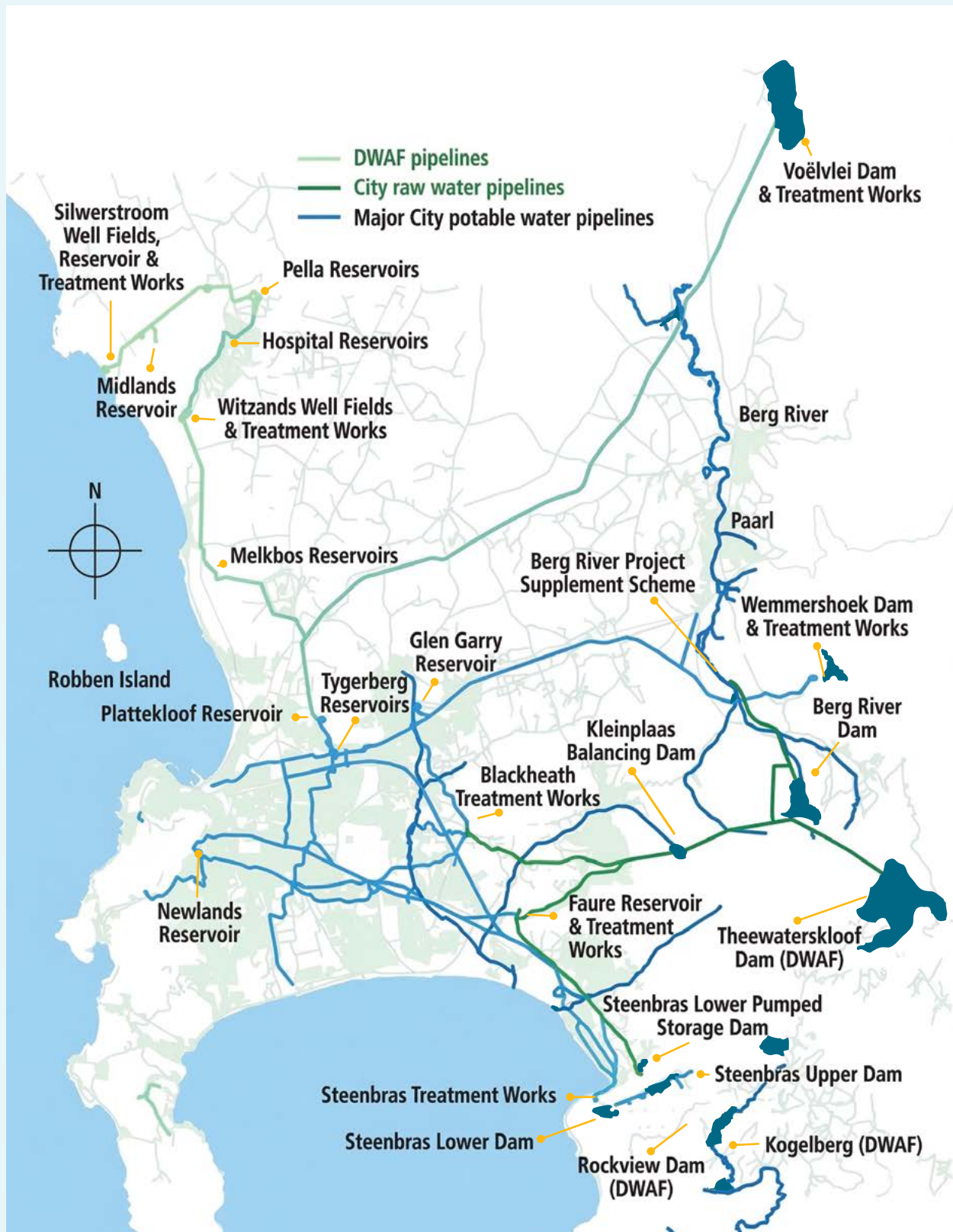
Cape Town has 12 water treatment works (WTW), ranging in treatment capacity from 3 Mℓ per day at Constantia Nek to 500 Mℓ per day at the state-of-the-art Faure treatment works. Collectively, these plants provide a treatment capacity of approximately 1 600 Mℓ per day. Treated water is distributed to nearly 730 000 consumer connections through a network of 85 pump stations, 26 large reservoirs, 103 smaller reservoirs and about 11 500 km of pipeline.

3.3. The City's WC/WDM progress to date

The following is a summary of the progress of the City's WC/WDM activities until 2024, undertaken since the approval of the first Water Conservation Policy (2001):

- a. Maintained the NRW level below the national average.
- b. Established the NRW steering committee in the Water and Sanitation Directorate.
- c. Established periodic monitoring and reporting. The Business Information Management section within the WDM, R&P Branch consolidates all WC/WDM inputs for reporting purposes.
- d. Developed and approved the City's Water and Sanitation Services Policy (2023).
- e. Developed a meter management policy.
- f. Developed a Decision Support System for effective bulk water distribution data to drive decision making.
- g. Revised the water and sanitation tariff policy to align with water restriction levels.
- h. Established DMAs for 70% of the water reticulation network, and pressure or flow monitoring.
- i. Initiated the development a Zonal Water Balance reporting dashboard, for 'bottom-up' reporting.
- j. Established Pressure Management and Advanced Pressure Managed zones, with $\pm$ 380 pressure reducing valves (PRV) installed.
- k. Implemented pipe replacement projects at an average replacement of 50 km per year.
- l. Implemented meter replacement at approximately 10 000 metres per year.
- m. Implemented bulk meter replacement projects to improve accuracy of the SIV of the City.
- n. Initiated the Advanced Metering Infrastructure (AMI) programme.
- o. Established a leak detection team, and procured leak detection equipment.
- p. Implemented an active leak detection and repair programme of 50% of the reticulation network per year, saving an estimated 3,5 Mℓ/day of water.
- q. Implemented sustainable domestic leak repairs focusing on more than 12 000 indigent homes, including skills transfer to communities: R2,7 million with estimated reduction in consumption of 3 Mℓ/day. Retrofitting of water efficient showerheads issued and installed by Eskom. The estimated reduction in water supplied is 1,3 Mℓ/day.
- r. WC communication, awareness and educational programmes implemented at around R3 million per year.
- s. New development and upgrade of the treated effluent infrastructure distribution systems, consisting of six reuse pump stations, two high-density polyethylene-lined reservoirs, approximately 255 km of network and average annual reuse of 50 Mℓ/day.
- t. Successful implementation of the drought response programme consisting of water restrictions, aggressive pressure reductions, effective WC awareness and education, amongst others (2015-2017).
- u. Established the water restrictions steering committee.

Figure 2: City's water supply: network of dams, reservoirs and bulk pipelines



Note: DWAF was the Department of Water and Forestry, which has since been replaced by the DWS.

- v. Updated water by-law to include water demand management measures.
- w. Established roles and responsibility agreements and service level agreements between WC/WDM implementing branches within the Water and Sanitation Directorate.

3.4. Climate change

Cape Town and its surrounds have a highly variable climate, with frequent droughts and floods experienced as part of the natural climate cycle. While climate change is expected to bring an increased drying trend to the Western Cape, it is also likely to lead to an intensification of extreme weather events, including extreme heat, heavy rainfall, floods and wind intensification.

Climate change is anticipated to cause a range of negative impacts on the region's water resources, including:

- a. Changing rainfall patterns;
- b. An increase in the intensity and frequency of extreme storms and associated floods;
- c. An increase in the intensity and frequency of drought events;
- d. Increases in evaporation, changes in soil moisture and runoff, impacting water availability; and
- e. Changing water quality conditions and associated impacts for both aquatic ecosystems and recreational usage.



4. City Water and Sanitation Directorate

4.1. Vision

By 2040, Cape Town will be a water-sensitive city that optimises and integrates the management of water resources to improve resilience, competitiveness and liveability for the prosperity of its people.

4.2. Mission

To provide safe, sustainable and affordable water and sanitation services through the efficient optimisation of resources and utmost respect for the environment.

4.3. Core business

The core business of the Water and Sanitation Directorate is to provide access equitably and efficiently to water and sanitation services to all residents of the City in a sustainable, safe, reliable, environmentally friendly and financially viable way, observing the dictates of good governance principles.

These services comprise activities associated with catchment management, groundwater abstraction, water purification and distribution as well as the collection and treatment of sewage, and effluent disposal and recycling.

The current organisational structure of the Water and Sanitation Directorate is illustrated below.

Figure 3: Organogram of the City's Water and Sanitation Directorate



4.3.1. Functional areas

The primary functions necessary for the provision of water and sanitation services include:

- Strategy, policy and guideline formulation.
- Water resource planning and management.
- Design, construction, and upgrading of infrastructure.
- Operation and maintenance of reticulation and collection networks and systems.
- Facilitation and management of urban development.
- Relationship management and education.
- Quality control and compliance monitoring.
- Water demand management and conservation.
- Management information systems (MIS).
- Information management and master planning.

Associated functions, such as billing and elements of customer care, are undertaken corporately by Financial Services in terms of a service level agreement.

4.4. Business focus areas

The Water and Sanitation Directorate adopted the framework for effective water and wastewater utility management developed by the American Water Works Association as a balanced scorecard for its business management. The framework covers all aspects of the water and sanitation business necessary to position the W&S Directorate to contribute effectively and efficiently to the achievement of the City vision. The following are the ten attributes that have been adopted:

- a. **Product quality:** The ability of the directorate to meet the potable water quality standards licence conditions, the DWS's general wastewater effluent standards, environmental management requirements and ecological needs.
- b. **Customer satisfaction:** The ability of the directorate to deliver basic services to all residents in the City, provide sanitation and water in informal settlements, set targeted and improved levels of service, provide an affordable service, and meet a service charter standard level of service. The W&S Directorate seeks to provide services to

backyarder dwellers on a direct basis in agreement with the landowners (e.g. Directorate of Human Settlements) and to private household owners.

- c. **Employee and leadership development:** The directorate finds it challenging to develop and retain its employees and ensure high levels of motivation among employees. This challenge demands that the directorate must ensure adequate staffing levels, skills retention, succession planning and individual development of employees so that their progression into management or a specialist function is supported adequately.
- d. **Operational optimisation:** This forces the directorate to review its business processes to ensure timely, on-going, cost-effective, reliable and sustainable service provision in all its operations. The W&S Directorate is challenged to minimise resource utilisation and losses, and to take advantage of technological advancement to improve its efficiency in providing water and sanitation services.
- e. **Financial viability:** The focus is for the directorate to improve its collection ratios and ensure that the tariffs, charges or any levies are fully cost-recovering in nature. In addition, there is a need to reduce high debt levels and improve the willingness to pay by its consumers. The investment into infrastructure must also be well timed, synchronised with mutual projects and appropriate funding explored to ensure a good return on investment. The cost of capital must be minimised and the challenge is how to achieve this given the consolidated nature of the investment decisions in the City. The W&S Directorate must also ensure effective utilisation and timely maintenance of its assets to sustain revenue growth levels that are in keeping with the consumer base growth.
- f. **Infrastructure stability:** This requires the directorate to understand when to create and dispose of an asset, the condition of its assets, its lifecycle costs, and the associated costs to be incurred in unlocking asset value in order to sustain the business. The W&S Directorate must ensure the timely maintenance, repair, rehabilitation, replacement and upgrading of

existing infrastructure. The lifecycle costs of the assets must be well understood and asset management plans developed. The directorate is currently developing asset management plans to be integrated into the SAP system modules, and this process is a huge challenge that requires time and resources to complete.

- g. **Operational resilience:** This requires the W&S Directorate to ensure adequate risk management for its water and wastewater business. The directorate has developed the Wastewater Risk Abatement Plan and the Water Safety Plan, and the DWS's requirements for these plans are becoming increasingly stringent. The establishment of operational tolerance levels that ensure adequate management of the legal, regulatory, financial, environmental, safety, and national disaster risks are still to be finalised. Servitude encroachment is a risk to the directorate as it affects the operational resilience of its service provision value chain.
- h. **Community sustainability:** This ensures infrastructure investment-led job creation for communities in the City. It will assist in improving the disposable income of households and enhance their ability to pay for water and sanitation services.

The directorate must ensure that its operations, services output and by-products, such as sludge and wastewater effluent, do not harm the environment and compromise community health. Infrastructure and operations must be managed to ensure the efficient utilisation of water resources and energy, and promote economic vitality with a minimum impact on the environment. Efforts should therefore be made to ensure that investments are green and that climate change impact is managed.

- i. **Water resource and demand management:** This focuses on the ability of the W&S Directorate to ensure security of water supply. The directorate plans to increase supply by up to 300 Mℓ/day through the New Water Programme in line with the Water Strategy (2019).
- j. **Stakeholder management:** This requires the directorate to identify the representatives of various stakeholders and ensure adequate engagement on issues that affect them. Satisfying differing views between interest groups throughout the City can prove a challenge for the W&S Directorate in its quest to provide the targeted improved level of service.





Section B:

Motivation and analysis

5. WC/WDM analysis

5.1. Overview

This section analyses the current water balance volumes and determines the opportunity for non-revenue water reductions through WC/WDM interventions. The potential economic benefits of WC/WDM are also calculated for specified interventions. The projected savings are based on assumptions, and progress towards achieving the targets will be monitored using MIS and field data.

5.2. Baseline water balance

The baseline water balance that has been adopted for the WC/WDM Strategy is the approved City water balance for the 2022/23 and 2023/24 financial years (Table 4 and Table 5). To ensure a realistic baseline, the two financial years' average volumes were used as the baseline on which the intervention impact estimates were projected.

Since 2020, the City has used an integrated approach to improve the quality of volume data represented on the water balance by breaking down and reporting on components of the water balance at a level of feasible measurement in line with the City system. A critical and necessary intervention that is under way is a comprehensive verification and improvement of the City system input volume measurements, as improved confidence in the SIV directly impacts the extent of planning and implementation.

A summary of the key figures from the water balance tables are highlighted in Table 6.

5.2.1. Non-revenue water

The City's NRW reduction target was set to 15% of supplied water in the 2007 and 2017 WC/WDM strategies. However, the City was unable to achieve and maintain the target. With the current NRW level at 27,1% (on average), it is necessary for the City to set a realistic target that balances the economic benefits of reducing NRW with the costs to achieve this target. The reduction will be achieved through a combination of WC/WDM interventions that include the supply of alternative water sources for non-potable use as a direct offset from the potable demand.

In 2017, during the drought period, NRW dropped below 20%, which is attributable to aggressive WC/WDM measures implemented during this period. However, as the City's water demand increased post-drought, the NRW level increased. The latest City NRW level is below the national average of 47% (DWS, 2023) and City SDBIP targets of 31%, but remains higher than the internationally accepted benchmark of 20%. The City's reduced NRW in FY2023/24 was due to the increased billed consumption percentage during this period.

Table 4: City of Cape Town water balance (12 months ending June 2023)

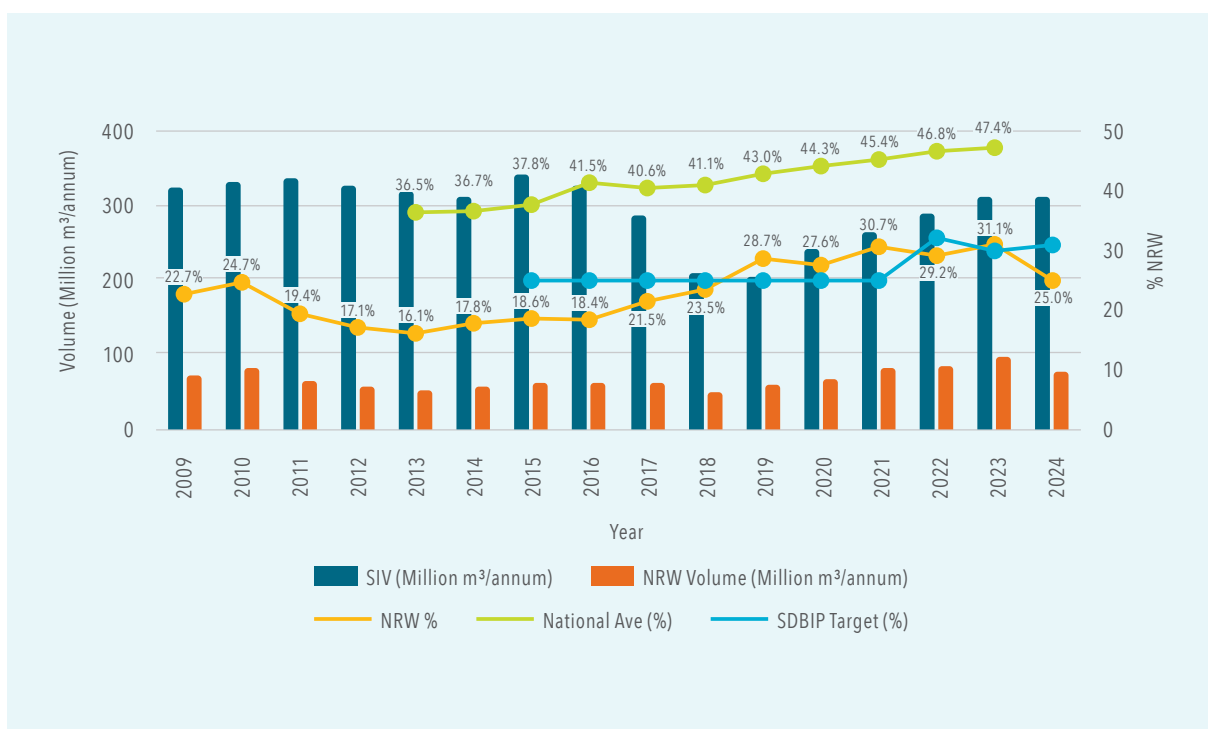
Note: All percentages are expressed as a percentage of SIV.

City of Cape Town component		IWA component			Revenue W
		Exported	Billed metered	Billed unmetered	
System Input Volume SIV 312 826 977 100,00%	Billed 218 659 877 69,90%	29 196 000	176 224 163	13 239 714	218 659 877 69,9%
	Unbilled 2 127 049 0,70%				
	Authorised 220 786 925 70,60%				
	External billings	29 196 000			
	Internal billings	176 224 163			
	Formal unmetered FBS (<=15 kℓ/m)	5 204 520			
	Informal Settlements FBS (<=6 kℓ/m)	8 035 194			
	n/a	0		0	
	Formal unmetered (est >15 kℓ/m)	1 734 840			
	Informal settlements (>6 kℓ/m) n/a	0			
NRW 94 167 100 30,1%	Bulk mains flushing	201 400			
	Retic mains flushing	133 294			
	Bulk reservoir cleaning	57 515			
	Retic reservoir cleaning (currently unavailable)	0			
	Firefighting (currently unavailable)	0			
	Unauthorised (% calc)	2 990 443			
	Metering losses (% calc)	11 068 326			
	Data losses (% calc)	0			
	Reported bulk res leaks, overflows and evaporation	15 000			
	Retic reservoir leaks and overflows (unavailable)	0			
Current annual real losses CARL 77 981 282 24,90%	Reported bulk pipe bursts	19 570			
	Reported retic pipe bursts	1 055 508			
	Located bulk leaks	33 770			
	Reported leaks Retic	1 920 968			
	Water balance remainder (assumed real losses)	74 936 466			
	Unavoidable real losses (UARL)	18 324 443			
	Potentially avoidable real losses	59 656 839			
	Unbilled unmetered	2 127 049			
	Unauthorised	2 990 443			
	Meter and data losses	11 068 326			

Table 6: Pertinent figures from water balance of FY2022/23 and FY2023/24

Components	2022/23 (Mℓ/day)	2023/24 (Mℓ/day)	Average over two years (Mℓ/day)
Average daily SIV (system input volume)	857,06	859,33	858,19
Average authorised billed consumption	599,07	652,71	625,89
Average NRW volume	257,99	206,62	232,31
Average NRW %	30,1%	24%	27,1%
Average authorised unbilled consumption	5,83	6,30	6,07
Average apparent water losses (commercial losses)	38,52	39,21	38,86
Average physical water losses (real losses)-{CARL}	213,65	161,10	187,37
Litres/capita/day (consumption)			158

Figure 4: City non-revenue water



For the City to achieve its NRW target of 20% by 2034/35, a combination of interventions will be implemented. The City has established a zonal water balance initiative intended to improve the water balance through a 'bottom-up' approach. In the zonal water balance the branches responsible for WC/WDM will implement some of the interventions at a zonal level and results will improve the Citywide apportioning estimates and targets.

5.2.2. Unbilled unmetered

The City will introduce interventions to improve visibility into the actual consumption volumes of the estimated 40 000 unmetered households and will then identify site-specific WC/WDM measures to reduce the consumption level to acceptable free basic monthly allocations. The City will introduce internal mechanisms towards improving the measurement of volumes apportioned to other unbilled unmetered components, such as flushing or scouring and firefighting.

Through the WC education and awareness programmes listed in section C (objectives), the City will identify site-specific feasible projects that will promote use efficiency for billed customers. The successful roll-out of advanced metering infrastructure (AMI) will assist consumers with their daily water consumption patterns, which may benefit the City by contributing to total demand reduction through wise use after the meter connections.

5.2.3. Water losses

5.2.3.1. Commercial/apparent losses

Commercial losses account for 38,8 Mℓ/day on the water balance. The City has little to no data errors due to the use of an advanced application for collecting meter readings. Approximately 88% of meters are read monthly. However, the current approach to the meter replacement priority is strictly reactive in that only meters that seized are being replaced. While it is assumed that the average lifespan of a meter is 12 years for budgeting purposes, it must be noted that 20% of the existing meters are more than 20 years old and directly contribute to over- or under-read metering. Improvement is required to ensure that meter experts drive the process of determining meter sizing,

calibration and verification, and validate the meter recordings. It is necessary to carry out research to determine the most optimal replacement age for various meters in the City and develop a metering policy for all meters. Metering losses due to aged meters will need to be reduced by 40% of the current volume of 11 Mm³/a by 2034/35.

Water theft ('unauthorised consumption') will need to be reduced by 50% of the current volume of 3 Mm³/a by 2034/35. It remains crucial for the City to monitor the volume to identify and resolve water theft timeously. Studies will be carried out to improve the apportioning of unauthorised consumption by using realistic City field data.

The City plans to commence the implementation of AMI roll-out from 2026/27, using a 15-year phased approach. This programme is intended to increase revenue collection, raise customer water conservation awareness and contribute to the reduction of water losses due to aged and defective meters.

Upon successful implementation of interventions, it is estimated the savings of up to 16 Mℓ/day could be achieved by 2034/35.

5.2.3.2. Physical water losses

Average physical water losses account for 68 Mm³/a or 22% of the SIV. Although the City has successfully implemented programmes to reduce and maintain affordable levels of leakage, the leakage level has not stabilised due to aging infrastructure and the average distribution system pressures. Water infrastructure asset management remains the most crucial intervention for reducing and maintaining low levels of physical water losses.

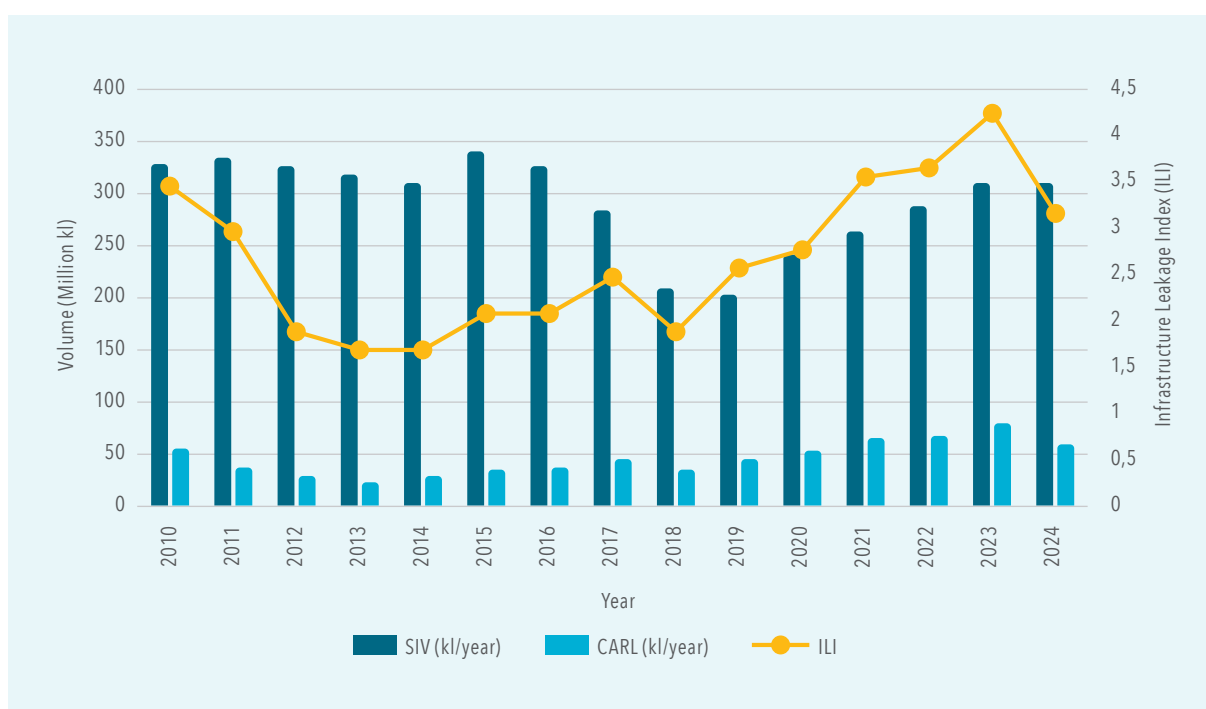
The City will implement a combination of key projects and interventions to reduce physical losses:

- a. Enhance pipeline replacement programme, from the current 0,4% p.a. up to 1,5% of the network per annum by 2034/35.
- b. The replacement of the 'service connections only' programme.
- c. The establishment of dedicated plumbing teams for leak repairs.

- d. Optimise pressure management by ensuring that the 70% of the network that is currently pressure managed remains discrete and that zones are maintained and monitored. The City will sectorise the remainder of the water reticulation system to achieve 100% zone coverage by 2034/35.
- e. Increase capacity for effective zone management.
- f. Enhance the active leak detection and repair programme through physical patrols, surveys and specialised leak detection equipment. The City will increase efforts to locate non-visible leaks and repair them within the timeframe stipulated in the service charter.
- g. Routine inspections and maintenance of critical water distribution infrastructure, such as reservoirs, fire hydrants, isolation valves and control valves. The City will enhance the management of these assets.

The City plans to enhance asset management practices and improve the current leakage control methods. As shown in Figure 5, the City's infrastructure leakage index (ILI) level averages 3,5 times the minimum accepted levels in the last five years, and the abovementioned interventions are intended to reduce the ILI to 2,5.

Figure 5: City infrastructure leakage index (ILI) trend

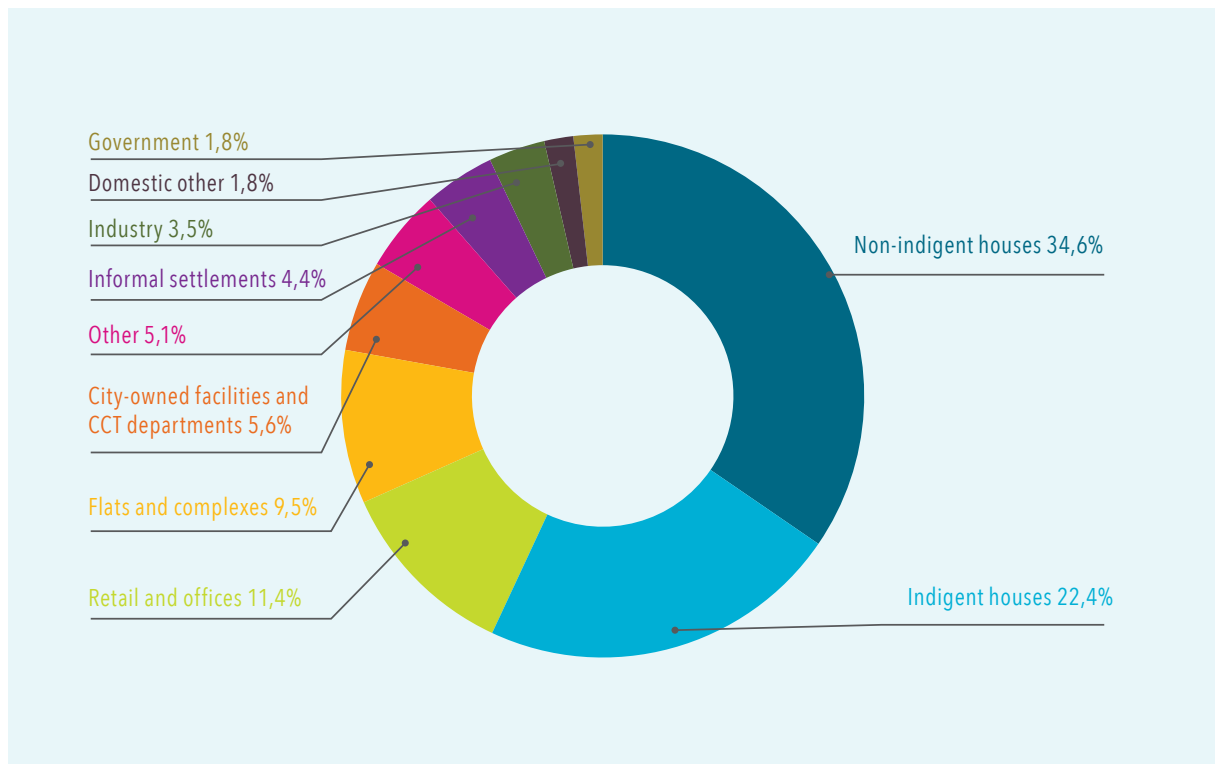


5.3. Authorised consumption analysis

The following demand analysis is based on 2022/23 consumption when residential demand accounted for 68,3%¹ of the overall demand, excluding informal settlements that accounted for a further 4,4%. The overall water use has gradually increased post-drought,

while the Covid-19 pandemic resulted in a sudden additional increase in water use to enable residents to conform to the safety measures associated with hygiene and working from home.

Figure 6: Potable water consumption by use category (FY2022/23)



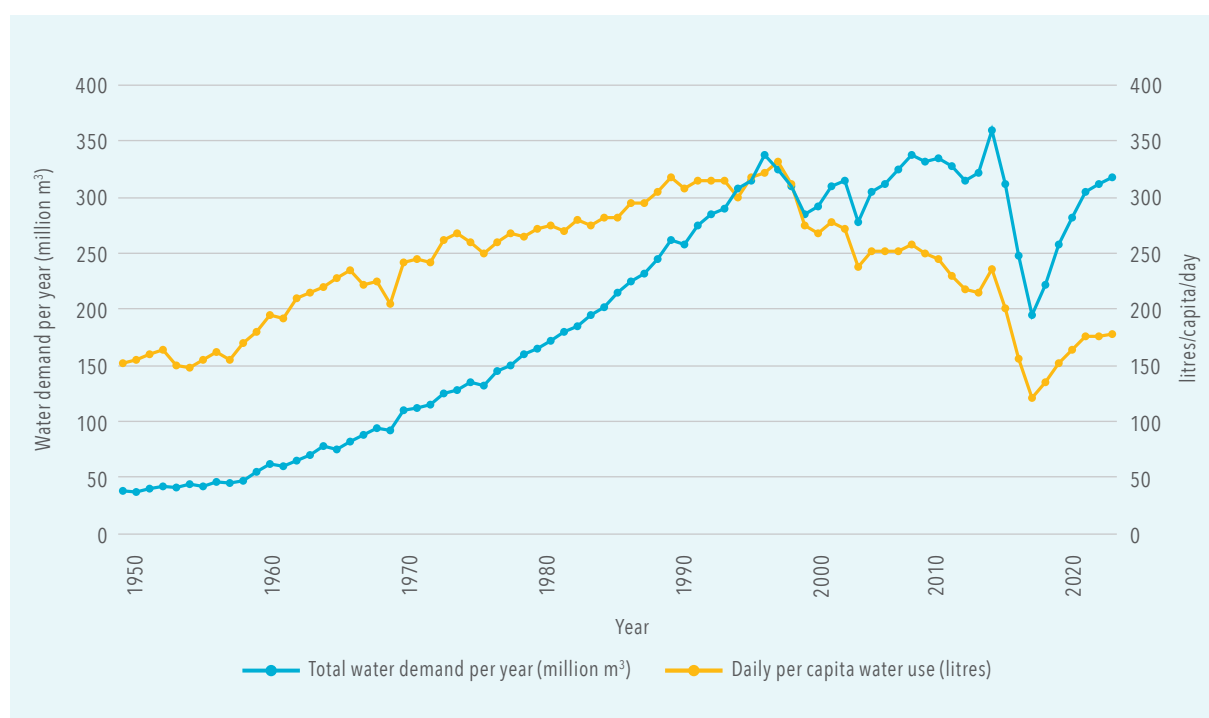
It is estimated that the average South African uses about 218 litres per capita per day (l/c/d) (No drop benchmark report, 2023). The average City water use is 157 l/c/d as shown in Figure 7 for consumers with full water supply services. Although it is within the international average of 120-180 l/c/d, there is an opportunity to further reduce the City's consumption by 5% to less than 150 l/c/d.

5.4. External bulk customers

The City will engage with the neighbouring municipalities that it supplies with bulk water supply to ensure alignment of their WC/WDM plans and operations. This is in line with the operational rules of the WCWSS, the City of Cape Town's water use licences, and the National Water Resource Strategy (Version 3), all of which require that water be used as efficiently as possible to ensure the sustainability of our shared water

¹ This can be disaggregated into indigent houses (22,4%), non-indigent households (34,6%), flats and complexes (9,5%) and other domestic users (1,8%).

Figure 7: City demand per capita water use



resources. These engagements will aim to ensure that similar targets of 150 litres per capita per day are met. This collective effort is crucial for maintaining adequate water supplies, especially during periods of scarcity. By actively participating in water-saving initiatives, all customers contribute to the long-term health of our environment and the wellbeing of our community.

5.5. Inefficient use of water

It is estimated that a significant proportion of water is used inefficiently. Inefficient water use is the amount of water that can be saved by implementing water efficient technology and practices, and by altering the consumption behaviour towards industry benchmarks and best available practices.

The City will establish site- and consumer-specific measurement criteria to measure and monitor the impact of the combination of interventions listed in Section C.

The following sections outline the estimated water use inefficiencies per sector.

5.5.1. Residential

Informal settlements and indigent households

The challenges of effective management of water supply in low-income areas are significantly different from water supply in middle- and higher-income residential areas. Informal settlements and indigent households account for 4,4% and 22,4% respectively of the City's consumption. Very high levels of inefficient water usage are experienced due to water wastage, illegal connections, unmetered consumption, and internal plumbing leaks. Minimum night flows (recorded on bulk zone/district meters) of 70% of the average demand have been recorded in several of these areas. The City aims to reduce the minimum night flow to below 50% of average demand.

The City's approach to WC/WDM interventions will entail the following:

- Prioritise WC/WDM interventions based on consumption per area.
- Develop and implement a standard operating procedure to manage consumption at indigent households that exceed the free allocation.

- c. Enhance the internal household leak repairs proactive programme and set aside adequate budget for this.
- d. Implement various water conservation education projects.
- e. Initiate basic training of local plumbers on leak repairs.
- f. Installation of flow limiters for debt management.
- g. Water By-law enforcement, including illegal connections.
- h. Advanced pressure reduction.

Non-indigent households

The water use efficiency of non-indigent households can be improved through consumer behaviour change projects that recommend that residents retrofit their plumbing fittings, use water-efficient appliances, replace grassed areas with alternative ground covers, use water-efficient plants for gardening, use pool covers, and use alternative water sources such as boreholes and rainwater harvesting.

5.5.2. Commercial/ businesses

The City will focus on the assessment of typical large water users, including schools, universities, colleges, medical facilities, clinics, hospitals, estates, government institutions, salons, restaurants, butcheries, bakeries, hospitality facilities and wet industries comprising brick factories, breweries, textiles and millings.

It is estimated that approximately 65% of the water used by commercial consumers is used for human needs, 25% for commercial processes and 10% for gardening. Water used for human needs is mostly used in toilets, urinals, hand basins, showers and kitchens. The opportunities for reducing water consumption in office buildings, commercial spaces or shopping malls are significant, and case studies throughout South Africa have illustrated the potential to reduce consumption in these locations by up to 80%. In practice, such savings have been achieved particularly in premises that have 'tip tray' urinals that waste up to 60 Kℓ/month for each unit. Due to the varying nature of commercial water consumers and usage, the combined

potential drop in consumption from water leaks and inefficient water usage is estimated at 18%.

5.5.3. Industry

As with commercial consumers, a portion of the water used by industrial consumers is used for domestic purposes (i.e. toilets, gardens) and can therefore be reduced without affecting industrial production. The opportunities for reducing industrial water consumption can also be enhanced by giving individual attention to the few large consumers who represent a significant portion of the total demand.

Potable water for industrial water usage can be further reduced by up to 50% by using treated effluent for non-potable use where feasible. Excluding the opportunity of using treated effluent, the total water wastage is estimated at 9% and the inefficient water usage is estimated at 11% of the total industrial water usage.

5.5.4. Municipal (City of Cape Town)

Municipal water is water used by various City departments and includes watering parks, dust suppression of roads, hydrant testing, flushing or scouring and cleaning of pavements, which accounts for 5,5% of the consumption. Although there has been an improvement over the years in these practices, interventions relating to City building retrofitting and maintenance of water-efficient technologies will be enhanced and monitored periodically.

Potable water for municipal water usage will be further reduced by using treated effluent for non-potable purposes. The treated effluent master plan for non-potable purposes identifies City-owned buildings and other facilities that are feasible for non-potable reuse connections.

5.5.5. Top consumers

An analysis of the large consumers is an important requirement for identifying WC/WDM potential. Key interventions will be to optimise the revenue collection from the top consumers by ensuring that all water supplied is accurately measured, and that their concerns regarding usage and accounts are addressed timeously. Other supporting measures include knowledge sharing

on water conservation techniques, information sharing on by-law compliance, and the star rating awards for efficient water usage.

Potable water savings can be achieved by promoting the use of alternative water, such as recycled, borehole/wellpoint water and treated effluent reuse for non-potable purposes.

5.5.6. New consumers

Opportunities for reducing water demand of new consumers include selecting appropriate levels of service for different communities, efficient plumbing fittings, efficient reticulation design practices and metering.

Reduction of new demand by new consumers can be achieved through the following activities:

- a. Providing guidelines for developers;
- b. Improved reticulation design, pressure management and plumbing standards;
- c. Strict construction supervision and monitoring practices to ensure materials and construction methods comply with national standards;
- d. Application for metered connections prior to commencement of construction and transferring them to the new owners;
- e. Effective billing systems;
- f. Communication and education campaigns;
- g. Enforcing relevant regulations and by-laws; and
- h. A high level of operation and maintenance, with rapid response to bursts and leaks.

5.6. WC/WDM demand projections

Between 1950 and 1998, water demand in the City grew at a rate of 4% per year. From 1999 to 2024, demand reduced significantly (negative growth) because of WC/WDM measures implemented by the City from as early as 2000. Between 2015 and 2017, there was a major drought that resulted in a further reduction in demand, mainly due to aggressive drought

response measures. Since 2022 until the time of writing (2025), water demand volumes have continued to increase steadily and it is evident that the increased summer consumption needs to be monitored closely. These trends highlight that the City's ongoing WC/WDM efforts remain essential and must be sustained, strengthened and expanded to safeguard water security and improve long-term outcomes.

The demand scenarios are also informed by the population and economic growth projections used in the City's draft Long-term Plan 2050 (2025), showing that the population growth rate will range between 1,0% and 2,2% and the economic growth forecast ranges from 2,6% to 4,9%.

In each of the scenarios below, the identified WC/WDM interventions and potential savings are the same. However, the resultant water demand growth is directly impacted by water demand, which is in turn linked to population growth and economic growth. Drawing from the City's Land Use Model 2040, the City's anticipated water demand by 2040 is $\pm 1\,220$ Mℓ/day. With current water demand at 859 Mℓ/day, this equates to a projected growth of 41% over a 16-year period.

To inform the water demand projections, the following scenarios were developed to account for different population growth scenarios:

- **Scenario 1 ('Do nothing'):** The City does not implement an active WC/WDM programme and population growth is assumed at 2,2% p.a.
 - The resultant water demand growth rate reverts to 4% p.a. over the next 10 years. The SIV will increase to $\pm 4\%$ p.a. average growth, NRW and consumption will increase to 44% and 193 l/c/d by 2034/35.
- **Scenario 2 ('Low population growth with WC/WDM'):** The City implements all WC/WDM interventions (existing and additional) and population growth is assumed at 1,6% p.a.
 - The resultant water demand growth rate is 2% p.a. over the next 10 years. The SIV can be reduced to $\pm 1\%$ p.a. average growth, NRW can be reduced to 20%, and consumption can fall to 149 l/c/d by 2034/35.

- **Scenario 3 ('Medium population growth with WC/WDM'):** The City implements all WC/WDM interventions (existing and additional), and population growth is assumed at 2% p.a.
 - The resultant water demand growth rate is 2,5% p.a. over the next 10 years. The SIV can be reduced to $\pm 1,5\%$ p.a. average growth, NRW can be reduced to 20%, and consumption can fall to 150 l/c/d by 2034/35.
- **Scenario 4 ('High population growth with WC/WDM'):** The City implements all WC/WDM interventions (existing and additional) and population growth is assumed at 2,2% p.a.
 - The resultant water demand growth rate is 3% p.a. over the next 10 years. The SIV can be

reduced to $\pm 2\%$ p.a. average growth, NRW can be reduced to 20%, and consumption can fall to 154 l/c/d by 2034/35.

The scenarios analysed for options to achieve the most realistic water savings after 10 years are shown in Table 7. Demand-side measures alone could contribute up to 90 Mℓ/day through efficiency improvements, apparent losses reduction and leak reduction, while supply-side interventions, such as using treated effluent for non-potable purposes, could offset an additional 16 Mℓ/day over the next 10 years. For the City to reduce NRW, it is crucial that **all new water connections are metered and billed immediately** to prevent unmetered authorised consumption from increasing further.

Table 7: 2034/35 demand scenarios

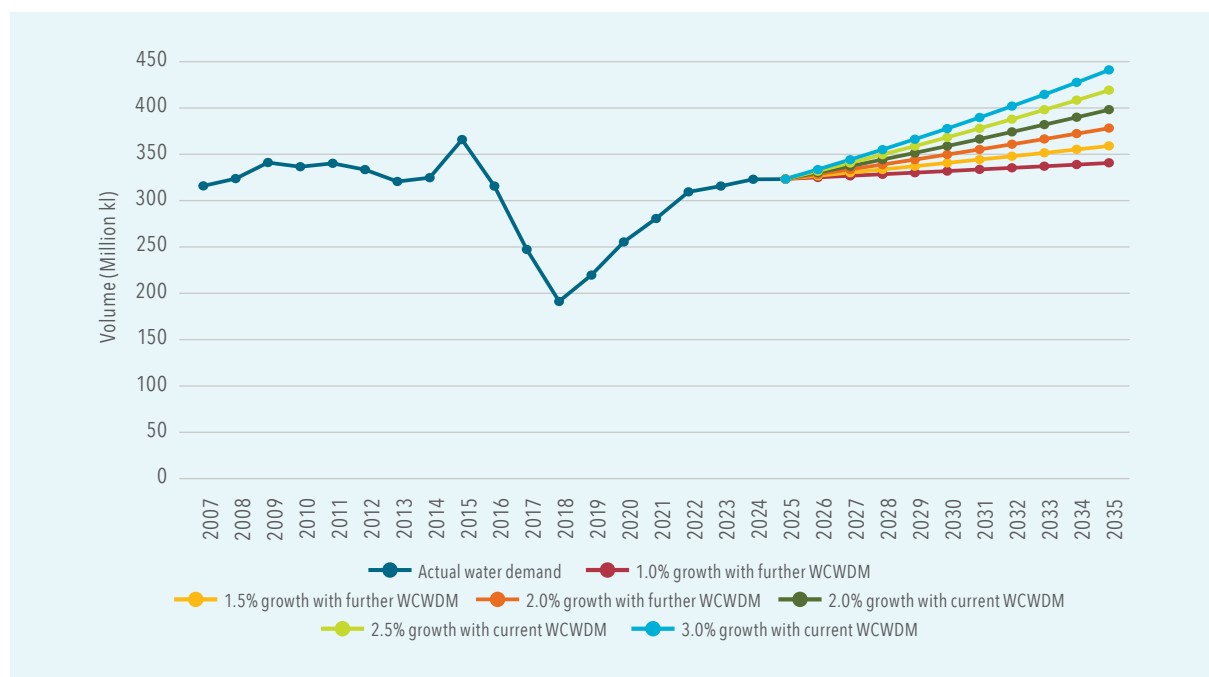
			Goals A, B and E		
Scenario	Base year	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	2023/24*	2034/35			
Assumptions					
Population growth p.a. (%) ²		2,2%	1,6%	2,0%	2,2%
Population	4 919 019	6 116 873	5 765 216	5 996 257	6 116 873
WC/WDM interventions		Reactive only	Current and additional		
Outcomes					
SIV current WC/WDM (m³/a)	313 240 764	463 672 850	381 838 743	400 974 660	418 930 310
Impact of additional interventions (m³/a)	0	14 456 801	32 862 503	32 862 503	32 862 503
SIV with WC/WDM	313 240 764	478 129 651	348 976 240	368 112 157	386 067 807
Billed consumption current WC/WDM (m³/a)	228 449 257	273 549 150	273 549 150	288 915 817	303 615 588
Impact of additional interventions (m³/a) – apparent losses	0	5 976 427	5 976 427	5 976 427	5 976 427
BC with WC/WDM	228 449 257	267 572 723	279 525 577	294 892 245	309 592 016
NRW (m³/a)	84 791 507	210 556 928	69 450 663	73 219 912	76 475 792
NRW (%)	27%	44%	20%	20%	20%
Volume exported to bulk external customers, including neighbouring municipalities (m³/a)	32 005 385	47 375 788	39 014 385	40 969 598	42 804 217
l/c/d	157	193	149	150	154

* **Note:** The base year is calculated as the average water balance of the 2022/23 and 2023/24 financial years.

2 Population growth figures aligned to the draft City of Cape Town Long-term Plan 2050.

Figure 8 shows the anticipated water demand growth where current (on-going) WC/WDM interventions are maintained and where additional interventions are implemented as outlined in this strategy.

Figure 8: Current and additional WC/WDM impact



For each scenario, a pair of graphs is included. The first graph for each scenario shows the 10-year impact on the SIV and billed consumption with and without additional WC/WDM interventions but maintaining current WC/WDM interventions. The second graph for each scenario indicates the annual anticipated

impact from the holistic implementation of WC/WDM interventions on NRW and water demand. The most probable scenario of $\pm 1.5\%$ water demand growth (scenario 3) for achieving goals A, B and E is shown in Figure 11 and Figure 12.

Figure 9: Impact on SIV and billed consumption at $\pm 1\%$ growth with additional WC/WDM (scenario 2)

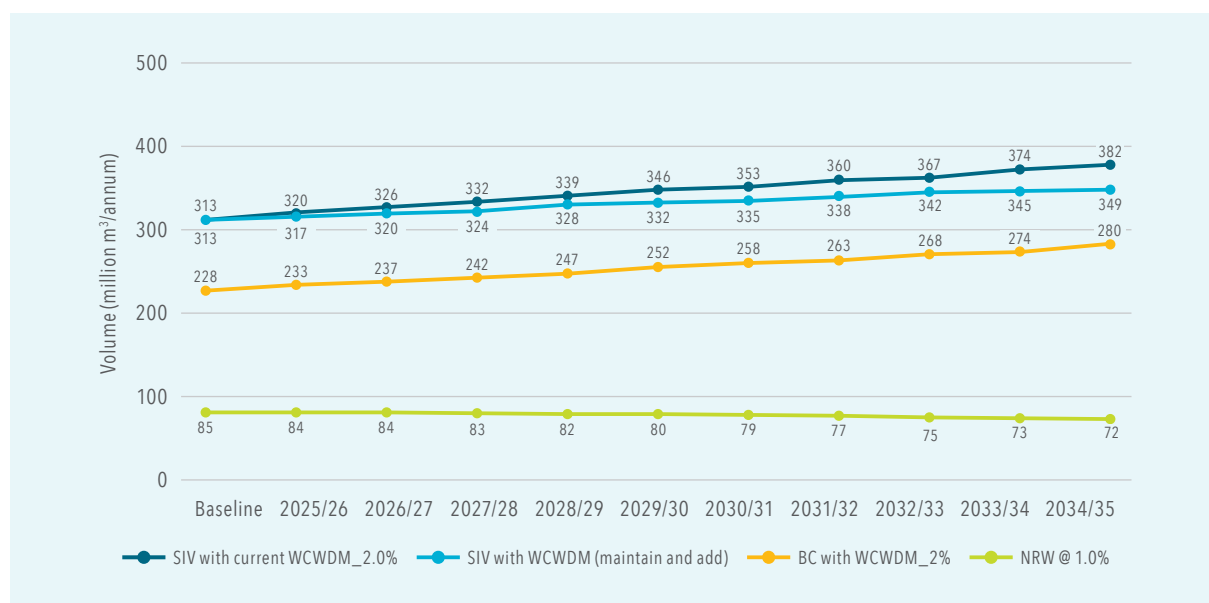


Figure 10: Reduction of NRW and I/c/d over 10 years at $\pm 1\%$ growth with additional WC/WDM (scenario 2)

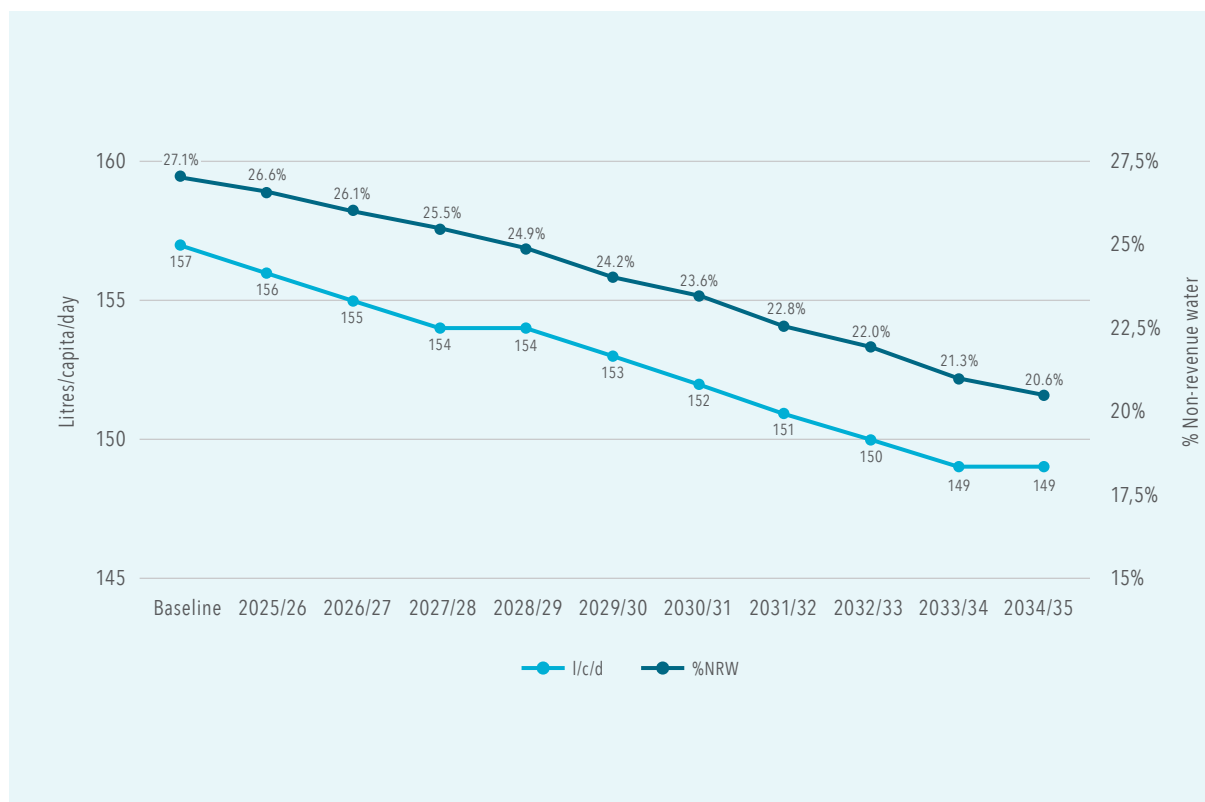


Figure 11: Impact on SIV and billed consumption at $\pm 1.5\%$ growth with additional WC/WDM (scenario 3)

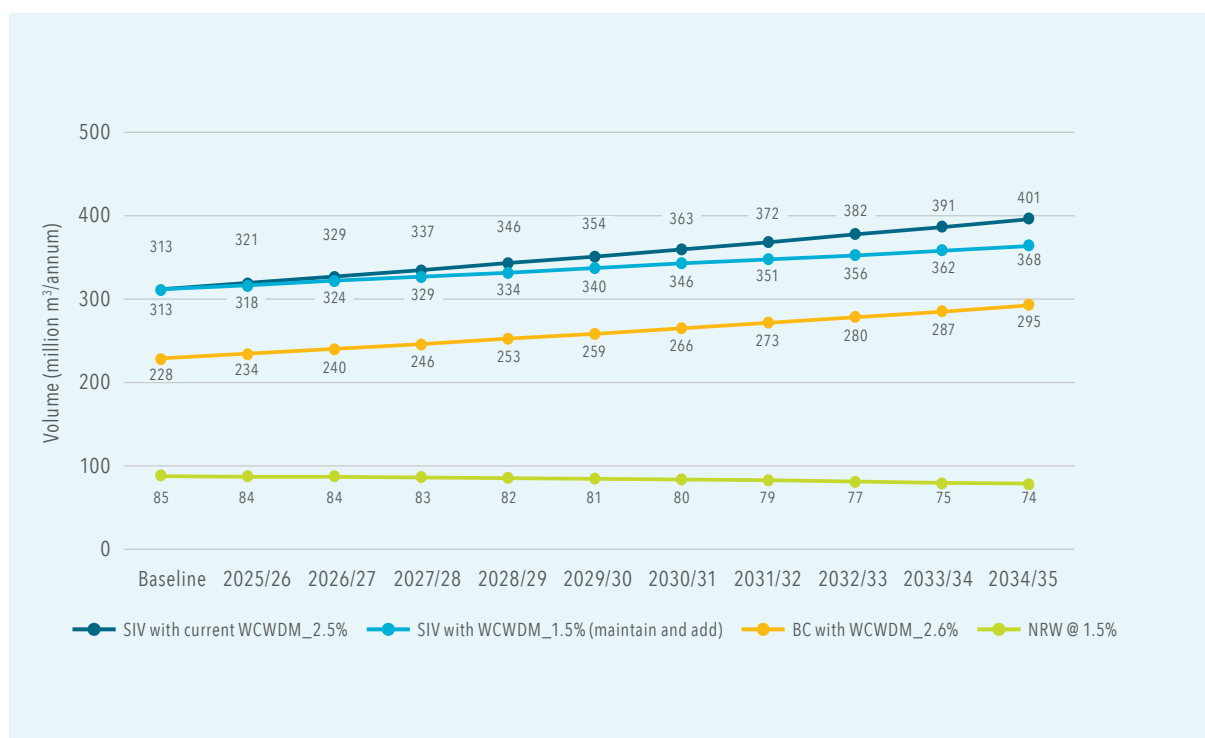


Figure 12: Reduction of NRW and I/c/d over 10 years at $\pm 1,5\%$ growth with additional WC/WDM (scenario 3)

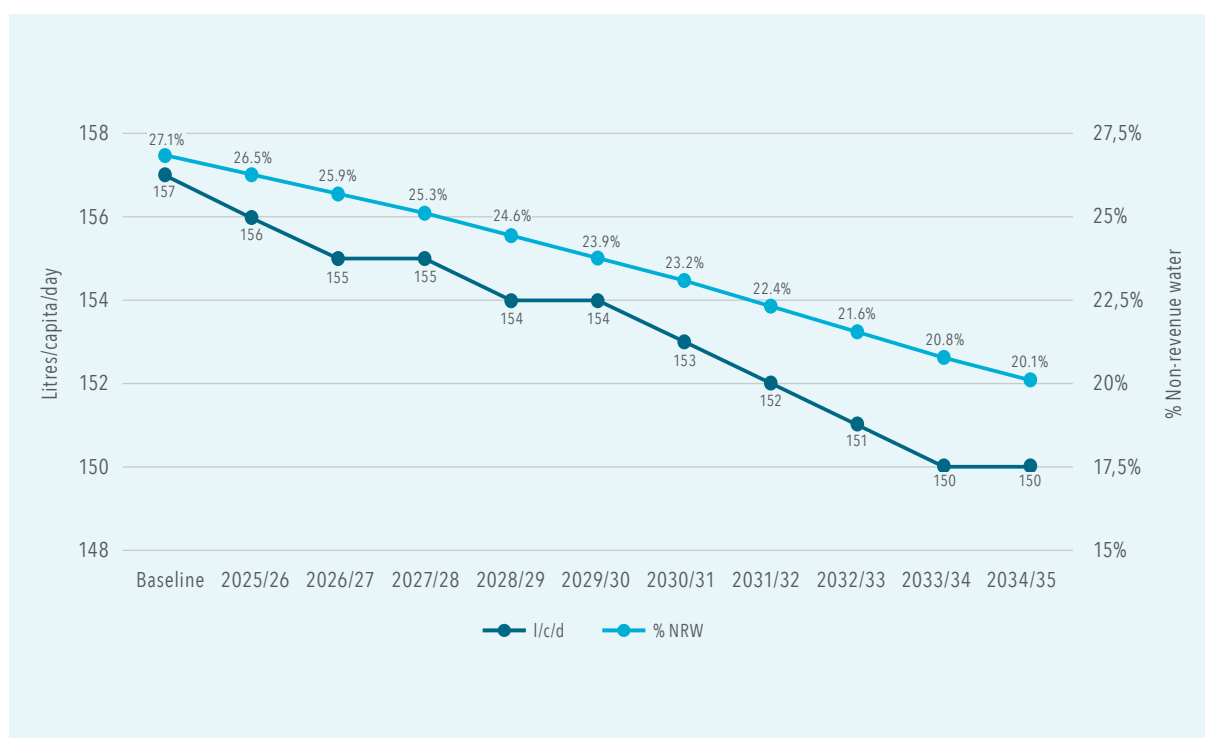


Figure 13: Impact on SIV and billed consumption at $\pm 2,0\%$ growth with additional WC/WDM (scenario 4)

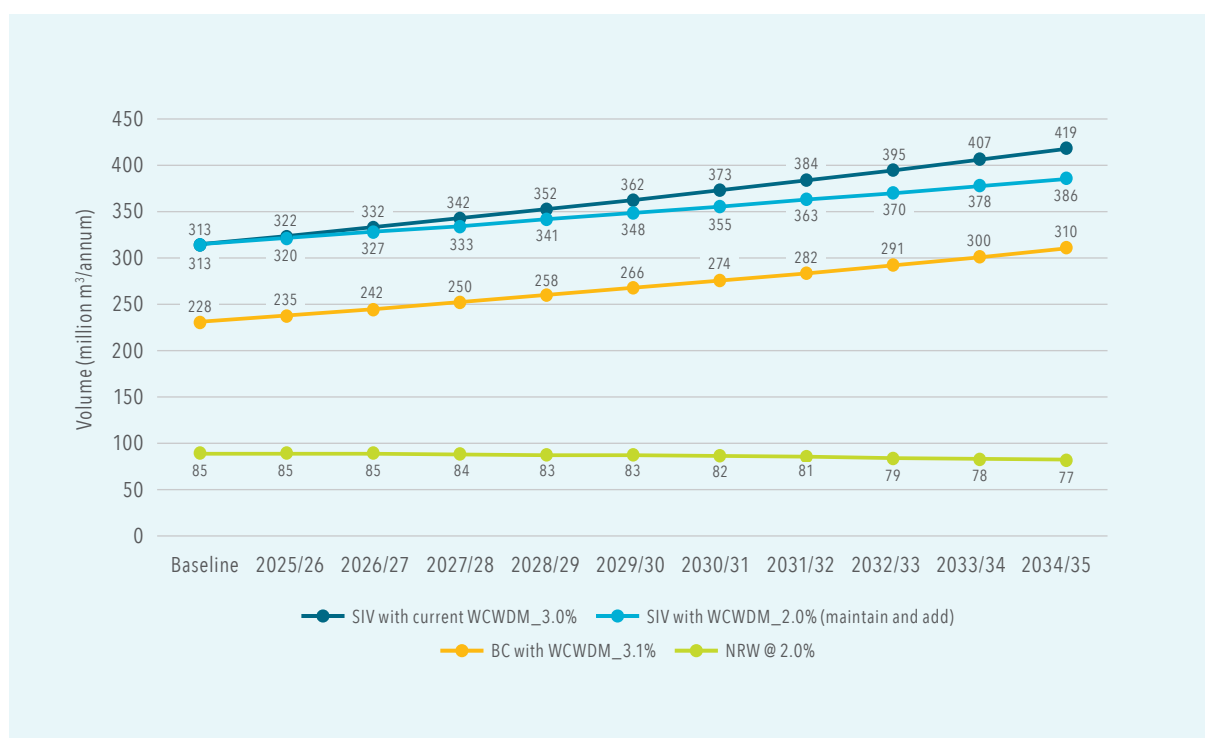
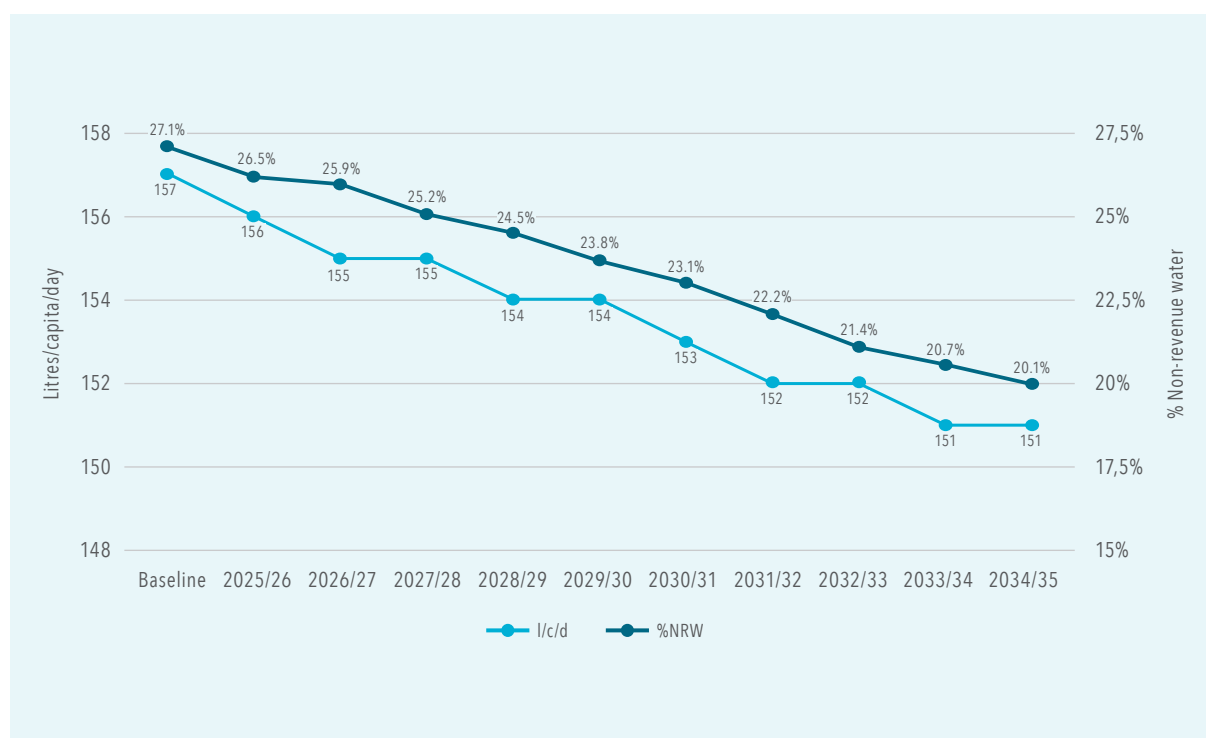


Figure 14: Reduction of NRW and l/c/d over 10 years at $\pm 2,0\%$ growth with additional WC/WDM (scenario 4)



5.7. Drought management

The Water and Sanitation Directorate has established a water restrictions committee with the mandate to monitor, evaluate and provide action plans in the event of a drought or critical emergency works resulting in restricted water supply. The City has developed drought tariffs that can be used to discourage wastage or can be enforced as punitive measures, if needed, in times of drought.

5.7.1. Water balance approach

The key to having comprehensive and reliable drought response actions is having an accurate water balance, as drought response is effectively about reducing demand in different components of the water balance. In 2015, the City was able to get through the drought and avoid day zero by successfully reducing water use by more than 40% without resorting to intermittent supply or rationing, which is internationally a remarkable achievement.

To reduce demand in a water-stressed environment (i.e. under drought conditions), the City would need to undertake both water conservation (intervention aimed at the physical reduction of the amount of water used by consumers) and water demand management/leakage reduction (intervention aimed at the reduction of leakage from the reticulation network prior to water reaching the consumers). The monitoring of DMAs contributes towards improved real loss volumes (physical leakage from the distribution network).

Water conservation would target all authorised consumption in the water balance, while water demand management/leakage reduction would target the real losses component in the water balance.

5.7.2. Water conservation interventions

A comprehensive suite of available water conservation interventions options for the City to reduce demand from consumers, either electively or forcibly in times of drought, is shown in Table 8.

Table 8: Assessment of available water conservation interventions

Intervention	Description	Positive impact	Negative impact
Consumer metering	Installation of a measuring device to control customer demand	Customer pays for actual use Customer demand is controlled through rising block tariffs	Expensive to maintain and read meters on a regular basis
Consumer flow limiter	Installation of restriction devices/washers to physically reduce consumption	Reduces consumption (but only pressure-dependent consumption)	Affects medium-term consumer habits; can increase network leakage
Punitive tariffs (water restriction level)	Raising tariffs to discourage use/abuse of water	Can reduce consumption (if consumers pay their bills)	Does not have desired impact on high-income bracket (high-usage consumers)
Forced repairs/retrofitting	Repair by water company of private property leakage to reduce water wastage	Reduces consumption and wastage Controls demand when customer cannot be disconnected	Sets ongoing precedent and liability issues
Penalties/fines	Financial penalty for non-compliance for consumption reduction	Can reduce consumption (if consumers pay their bills)	Does not have desired impact on high-income water consumers (high-usage consumers)
Usage bans	Bans on types of water use (irrigation, hosepipes, car washing, etc.)	Reduces consumption	Difficult to enforce
Illegal connection policing	Active identification and removal of illegal connections	Reduces illegal consumption (and often leakage from the illegal connection)	Difficult to control and enforce
Pressure management	Widespread pressure management can reduce pressure-dependent consumption	Pressure management reduces network leakage plus pressure-dependent consumption	Reduces consumption and therefore revenue
Public standpipe control	Restriction of flow or pressure at communal points of water supply	Reduces wastage and unrestricted use of water	Can cause frustration and consequently vandalism
Water-efficient devices	Installation of devices that reduce the volume of water used from fittings and fixtures (low volume cisterns, showerheads, aerators, etc.)	Reduces consumption	Reduces consumption and therefore revenue
Consumer education and awareness	Making consumers aware of water shortage in practical ways through high-profile advertising (multimedia)	Educated consumers	Consumer apathy

5.7.3. WDM/leakage reduction interventions

A comprehensive suite of available WDM/leakage reduction interventions is presented in Table 9.

Table 9: Assessment of available WDM/leakage reduction interventions

Intervention	Description	Positive impact	Negative impact
Water rationing/ intermittent supply	Shutting down water supply at source/ reservoirs into reticulation networks	Perceived reduced consumption	Actually increases SIV; increased burst frequency; deteriorated water quality; increased leakage; reduced asset life; expensive; demoralises staff
Active leak detection	Actively looking for leaks in networks (visual, mechanical, electronic, etc.)	Improved customer confidence, reduced leakage, extended asset life	Disruptive to customers if large areas must be shut down to fix leaks
Passive leak detection	Respond to leaks reported by the community	Consumer buy-in, economical method to locate and report leaks	Leaks are not reported and repaired in despondent communities Community becomes despondent if City does not respond to leaks
Pressure management	Reducing minimum supply pressures to 24 m at critical points of the network through a variety of options	Reduced leakage, reduced burst frequency, extended design life of infrastructure, improved level of service	Increased consumer complaints (low pressures) due to lack of water conservation education
Control valve maintenance	Install new control valves, and operate and maintain all control valves to optimise system operations	Prevents reservoirs and tower from overflowing, improved pump control, improved pressure and flow distribution	Requires skilled staff to operate and maintain Poor maintenance results in excessive water losses and poor service delivery
Improved leak repair times	Improving either leak/burst isolation time or repair time	Improved customer confidence, reduced leakage	Leaks are repaired without advanced notifications Customer cannot prepare for water supply disruptions
Accelerated pipe replacement	Aggressively targeting replacement of problematic pipe sections	Reduced leakage Continuous asset replacement programme	Interrupted water supply, possibly increased leakage if not implemented correctly
System storage optimisation	Efficient bulk control of terminal storage reservoirs through optimising top water levels or outlet control; or alternatively optimising/balancing treatment with demand	Reduces leakage over wide area	Compromises on-storage capacity and firefighting capacity
Bulk metering and sectorisation	Sectorise the distribution system into smaller district metered areas (DMA)	Areas with high leakage can be identified and prioritised	Discreteness must be checked regularly Bulk meters must be maintained and monitored

5.8. Total opportunity of WC/WDM

From the demand analysis and consultations, the implementation of this WC/WDM Strategy could achieve the following by 2034/35:

1. Reduce total water demand by up to **90 Mℓ/day** through a combination of interventions:
 - 1.1. Reduce physical water losses by up to **68,5 Mℓ/day**;
 - 1.2. Reduce inefficiencies by up to **5,5 Mℓ/day**; and
 - 1.3. Through expansion of the treated effluent supply schemes, contribute to potable water demand reduction by approximately **16 Mℓ/day** (treated effluent-direct potable offset), and supply an additional 50 Mℓ/day

effluent reuse and other alternative water sources for non-potable reuse.

2. Reduce commercial water losses to increase revenue water by up to **16 Mℓ/day**.
3. Reduce and maintain the average consumption at **150 l/c/d**.
4. Prevent exacerbated, unavoidable physical water losses and the natural rate of rise in leakage beyond the current estimate of **40 Mℓ/day (4%) of the SIV**.

The City cannot achieve its WC/WDM objectives through capital investment alone. It is essential that interventions are complemented by measures that build public understanding of water-saving practices, raise awareness of the importance of conservation, and ensure effective enforcement of relevant City by-laws. These measures are integral to realising the goals outlined in this strategy.





Section C:

Framework of action

6. Overview

6.1. Goals

The five key goals that the strategy is based on are as follows:

Goal A: The City must by 2034/35 reduce and maintain the NRW to below 20% of water supplied, from 27,1% (2023/24).

Goal A requires the City to ensure that there are collaborative efforts to reduce water losses, control and reduce unbilled consumption, and promote water use efficiency.

Goal B: The City must by 2034/35 reduce and maintain water consumption to below 150 l/c/d of total potable water supplied (City SIV), from 157 l/c/d (2023/24).

Goal B is to ensure that all City consumers do not waste water but endeavour to use water efficiently.

Goal C: The City must ensure and maintain ongoing, effective management systems and water use efficiency measures.

Goal C is to ensure the City implements an effective management system to monitor and evaluate all WC/WDM measures and to provide more cost-effective solutions.

Goal D: The City must maintain WC/WDM as one of the key water service delivery strategies, and must give priority to its implementation and ensure an ongoing, adequate enabling environment.

Goal D is to ensure that the City allocates adequate financial and human resources for the implementation of interventions.

Goal E: The City must by 2034/35 reduce and maintain the projected potable water demand to an average growth rate of between 1% and 1,5% p.a. (assuming a population growth rate between 1,6% and 2% p.a.)

Goal E will be achieved as a result of successful implementation of goals A and B.

6.2. Implementation priorities and process

The primary objective of WC/WDM is to facilitate increased efficiency and equity in the provision of water and sanitation services, through various techniques and practices.

6.2.1. Implementation process for reducing non-revenue water demand

It is important to recognise that although the Strategy is defined according to specific objectives, programmes and activities, a number of them are interlinked and should be implemented in a specific order. Of particular importance is the need to implement management information systems and to carry out activities that will assist in determining or verifying the extent of losses for each category.

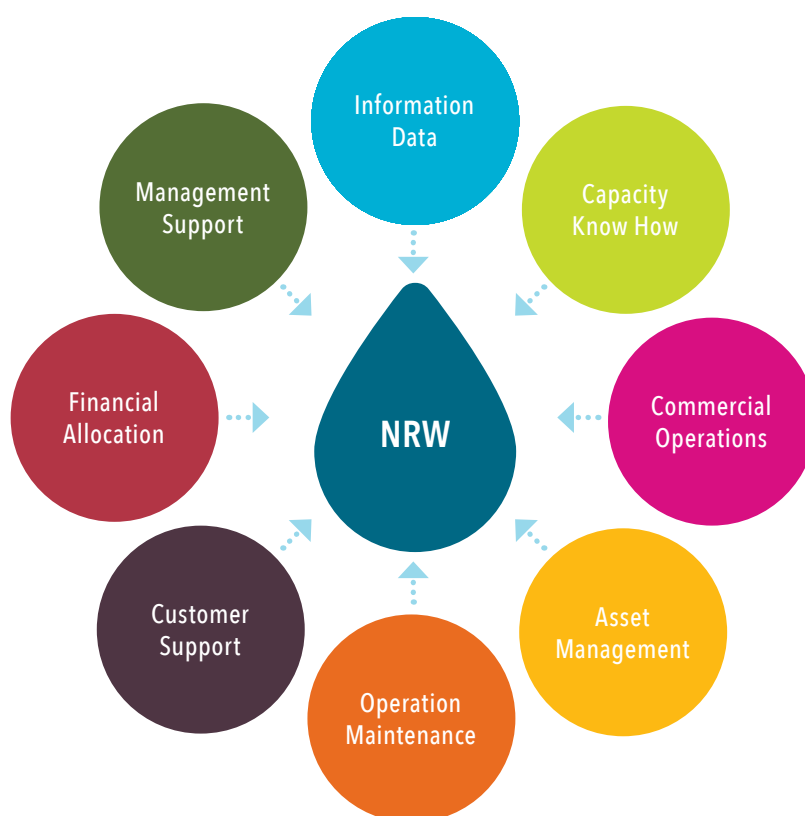
6.3. Roles and responsibilities

The framework of action refers to WC/WDM activities and programmes that need to be implemented by various branches in the four departments within the Water and Sanitation Directorate.

6.3.1. Overview of current situation in the W&S Directorate

From 2020, there has been intentional effort to improve collaboration and prevent duplication of activities through the enforcement of roles and responsibility agreements, service level agreements and other formal instructions between branch managers and directors within the W&S Directorate. The Water and Sanitation management team continues to work together towards ensuring that the required resources, including budget, are in place for the implementation of WC/WDM programmes across the W&S Directorate.

Figure 15: Reducing NRW (DWS; WC/WDM Strategy)



6.3.2. Clarification of WC/WDM roles and responsibilities within the W&S Directorate

Below is a summary of the responsibility of branches that have a direct impact on the success of WC/WDM programmes in the City;

- a. The Wastewater Branch is responsible for all City WWTW upgrades and management, resulting in direct impact on the quality of treated effluent that is available for reuse or release into the environment.
- b. Communications and Partnerships is responsible for City water conservation education and awareness programmes to support and sustain the technical projects and influence water use behavioural change.
- c. Customer Services is responsible for the directorate's billing and all programmes linked to the management of apparent/commercial water losses.
- d. The Bulk Water Branch is responsible for management and water loss reduction interventions in the bulk system.
- e. The Reticulation Branch is responsible for management and real/physical loss reduction interventions in the distribution system.
- f. The WDM,R&P Branch is responsible for water use efficiency programmes and Water By-law enforcement.
- g. The Informal Settlements Basic Services Branch is responsible for all WC/WDM-related activities in informal areas.

7. Implementation objectives

These are the objectives that refer to reducing and sustaining the water demand to specific targets. These objectives are divided into two components: water demand reduction and water resource objectives. Water demand reduction objectives relate to activities that will directly result in the reduction of losses or water usage by consumers (demand-side interventions). Water resource objectives relate to activities that will protect the current water resources and explore

alternative resources that will alleviate the impact on resources (supply-side interventions).

Goals A, B and E relate to the implementation objectives that will result in the direct reduction of water demand. The implementation objectives and associated interventions have been developed under the various goals.

7.1. Goal A – Target NRW < 20%

Goal A: The City must by 2034/35 reduce and maintain the non-revenue water to below 20% of water supplied.

Table 10: Goal A – Objective, interventions, activities and responsibility

Objective	Interventions	Activities	Responsibility
A1 Reduce and maintain low levels of water losses through the reticulation system	A1.1 Optimised pressure reduction	A1.1.1 Divide areas into suitable zones and DMAs	Water Demand Management, Regulation and Planning Reticulation Engineering and Asset Management
		A1.1.2 Implement advanced pressure management on existing pressure management zone for optimal benefits	
		A1.1.3 Install PRVs in priority areas	
		A1.1.4 Ongoing maintenance of PRVs	
		A1.1.5 Implement data logging and advanced pressure management	
		A1.1.6 Ongoing maintenance of advanced pressure management and monitoring infrastructure	
		A1.1.7 Establish a zone management field team	
	A1.2 Enhance active leak detection and repairs	A1.2.1 Increase established specialised leak detection teams	WDM, R&P
		A1.2.2 Ongoing costs of the specialised teams	
		A1.2.3 Ongoing advanced leak detection on water system	
		Active leak repairs in bulk system:	Bulk Water
		A1.2.4 Repair of leaks once identified	
		A1.2.5 Additional law enforcement to support leak detection and repair in high-risk areas	Reticulation
		Expedite active repairs in reticulation system as per service charter:	
		A1.2.6 Repair of leaks once identified	
		A1.2.7 Additional law enforcement to support leak detection and repair in high-risk areas	

Objective	Interventions	Activities	Responsibility
A2 Reduce and maintain low levels of demand by consumers	A2.1 Implement water management programmes in low-income areas and informal settlement areas	Informal settlement areas: A2.1.1 Water-efficient plumbing technologies A2.1.2 Asset management: Expedite repairs and maintenance of water infrastructure in line with service charter A2.1.3 Meter and monitor water consumption	Informal Settlements Basic Services in W&S
		Low-income areas: A2.1.4 Rainwater harvesting (schools/libraries/sports centres) A2.1.5 Water-efficient plumbing technologies A2.1.6 Meter and monitor water consumption	Customer Services WDM, R&P
	A2.2 Fix-it domestic leaks	A2.2.1 Implement ongoing awareness and education prior to repairs A2.2.2 Visit properties and leak repairs (indigent households)	Customer Services
	A2.3 Implementation of the City's Credit Control and Debt Collection Policy	A2.3.1 Monitor high-consumption patterns, ensure compliance with latest debt management policy A2.3.2 Develop a management information system for flow restrictors A2.3.3 Water services connection restriction/reconnection A2.3.4 Install flow restrictors A2.3.5 Ad-hoc leak repairs	Customer Services
A3 Adopt and implement proactive O&M measures to reduce non-revenue water	A3.1 Enhanced rehabilitation of the reticulation network (pipe and service connection replacement)	A3.1.1 Carry out a research project to determine effective City target for pipe and/or connection replacement programme A3.1.2 Develop a pipeline and/or connection management programme A3.1.3 Critical pipeline and/or connection replacement programme A3.1.4 Trenchless technology deployment A3.1.5 Introduce smart pipeline monitoring integration A3.1.6 Cathodic protection and rehabilitation A3.1.7 Water distribution network optimisation	Reticulation
	A3.2 Preventative maintenance on reticulation system	A3.2.1 Control valve inspection and maintenance A3.2.2 Reticulation valve inspection and maintenance (isolating valve and fire hydrant audits, marking and checking) A3.2.3 Reservoir inspection and maintenance A3.2.4 Pump station inspection and maintenance A3.2.5 Zone meter inspection and maintenance A3.2.6 Confirm zones and zone discreteness	Reticulation WDM, R&P
	A3.3 Preventative maintenance on bulk system	A3.3.1 Pilot leak detection technology on bulk water system A3.3.2 Install flow-control needle valve on bulk system A3.3.3 Bulk system valve inspection and maintenance A3.3.4 Bulk reservoir inspection and maintenance A3.3.5 Cathodic protection of bulk infrastructure A3.3.6 Bulk meter inspection and maintenance	Bulk Water

Objective	Interventions	Activities	Responsibility
A3 Adopt and implement proactive O&M measures to reduce non-revenue water	A3.4 Passive leakage control reticulation (corporate call centre)	A3.4.1 Upgrade and operate dispatch operating centre (Technical Operations Centre help line) A3.4.2 Promote e-service request app A3.4.3 Improve processes for responding to water leak queries and allocate adequate resources to ensure speedy turnaround time A3.4.4 Maintain a monitoring system and quality assurance measures to ensure problems are resolved adequately	Reticulation Customer Services
	A3.5 Maintain uniform operations and maintenance procedures (reticulation)	A3.5.1 Maintain the reticulation infrastructure O&M procedure A3.5.2 Continual development and training of staff on functions A3.5.3 Maintain and upgrade Reactive Issues Management Application (RIMA) system	Reticulation
A4 Reduce and maintain low levels of apparent (commercial) losses	A4.1 Commercial data validation	A4.1.1 Acquisition and implementation of a commercial data evaluation information system (AMI integration) A4.1.2 Customer data evaluation and verification exercise A4.1.3 Connection and meter data evaluation and verification exercise A4.1.4 Modification and ongoing customer and connection data validation	Customer Services
	A4.2 Meter management and replacement programme	A4.2.1 Develop a City meter management and replacement standard operating procedure A4.2.2 Testing and replacement of faulty meters reported by consumers A4.2.3 Replacement of domestic meters A4.2.4 Replacement of domestic meters with smart meters (AMI) A4.2.5 Install and maintain meters in all informal settlements A4.2.6 Install and maintain meters in all formal households A4.2.7 Finalise and maintain City water meter sizing methodology	Customer Services WDM, R&P
	A4.3 Billing exception reports	A4.3.1 Identify all meters not read regularly and resolve problems A4.3.2 Identify all meter and erf discrepancies and resolve problems A4.3.3 Identify all consumer detail discrepancies and resolve problems	Customer Services
	A4.4 Management of large consumer meters	A4.4.1 Carry out a desktop study/analysis of all large consumers and evaluate if meters are sized correctly, and other key parameters A4.4.2 Carry out on site calibration of all large consumer meters A4.4.3 Replace all faulty or incorrectly sized meters A4.4.4 Implement an ongoing oversight function of all large consumer meters and accounts	Customer Services

Objective	Interventions	Activities	Responsibility
A4 Reduce and maintain low levels of apparent (commercial) losses	A4.5 Reduction of illegal connections	A4.5.1 Review procedures and by-laws regarding illegal connections (as required) A4.5.2 Carry out an investigation to identify illegal connections throughout the City A4.5.3 Disconnect or formalise existing illegal connections A4.5.4 Inspect fire hydrant seals A4.5.5 Police and enforce by-laws with regard to water connections for developers	Customer Services Reticulation WDM, R&P
	A4.6 Management of meter readings	A4.6.1 Monitor meter readings and carry out regular checks A4.6.2 Maintain regular consultations with meter reading contractors, identify and resolve problems A4.6.3 Review meter cycles, costs and procedures by meter readers A4.6.4 Respond to any exception reports (reported leaks, damaged meters, water wastage, etc.)	Customer Services
A5 System input volume (bulk water sales) verification	A5.1 Verification of SIV	A5.1.1 Monitor bulk meter readings and carry out regular checks A5.1.2 Review meter cycles, costs and procedures by meter readers and revise if necessary A5.1.3 Respond to any exception reports (reported leaks, damaged meters, water wastage, etc.) A5.1.4 Implement remote reading project A5.1.5 Regular inspection of all bulk water custody transfer meters A5.1.6 Installation of new bulk meters (bulk meter replacement programme) A5.1.7 Maintain field measurements and flow logging of existing meters to determine demand and leakage volumes	Bulk Water

7.2. Goal B – Target < 150 l/c/d

Goal B: The City must by 2034/35 reduce and maintain water consumption to below 150 l/c/d.

Table 11: Goal B – Objective, interventions, activities and responsibility

Objective	Interventions	Activities	Responsibility
B1 Promote the efficient use of water to consumers and customers	B1.1 Generic consumer awareness campaign	B1.1.1 Advertising in media B1.1.2 Press releases B1.1.3 Development and distribution of leaflets, fliers and posters B1.1.4 Billboards, shopping centres and washrooms B1.1.5 Competitions/drama festival B1.1.6 Recognition awards on water use efficiency	Communications and Partnerships
	B1.2 Domestic consumer education campaign	B1.2.1 Develop exhibitions of water-wise gardens B1.2.2 Develop and distribute pamphlets, booklets B1.2.3 Hold public workshops and seminars B1.2.4 Develop a WC/WDM information helpline (can be a recording) B1.2.5 Skills transfer workshops	Communications and Partnerships

Objective	Interventions	Activities	Responsibility
B1 Promote the efficient use of water to consumers and customers	B1.3 School education campaign	B1.3.1 Assist in the implementation of the DWS environmental education project B1.3.2 Develop and distribute additional literature to schools B1.3.3 Hold school competitions (link to Water Week), drama festival B1.3.4 Assist and promote water audits, retrofitting of plumbing and use of boreholes	Communications and Partnerships
	B1.4 Special events	B1.4.1 National Water Week B1.4.2 Cape Town Flower Show B1.4.3 Annual conference on water supply B1.4.4 Exhibitions and conferences (still to be determined) B1.4.5 Service delivery programmes within informal settlements	Communications and Partnerships
	B1.5 Water-related forums	B1.5.1 Contribute to WC strategies at water forums, seminars and workshops	Communications and Partnerships
	B1.6 Introduction of virtual reality (VR) and augmented reality (AR) experiences	B1.6.1 Introduce public VR simulation (where feasible). VR or AR simulations will be available to the public at popular locations allowing the public to interact where the experiences highlight the consequences of water misuse, such as droughts, water leaks, depleted reservoirs, or polluted water sources. Users can virtually experience the impact of their actions on the environment and learn about effective conservation strategies.	Communications and Partnerships
	B1.7 Utilisation of mobile applications	B1.7.1 Leverage social media platforms to launch targeted campaigns highlighting water conservation issues, sharing success stories, and encouraging individuals to act through hashtags, interactive content, and user-generated challenges B1.7.2 Initiate a viral hashtag campaign (#EveryDropCounts) encouraging users to share their water-saving tips, photos of water-efficient practices, and pledges to reduce water usage, amplifying awareness and fostering a sense of community involvement B1.7.3 Develop and disseminate engaging content such as infographics, videos, and challenges B1.7.4 Collaborate with influencers to amplify the reach of the campaigns B1.7.5 Host live sessions and Q&A forums to engage directly with the community	Communications and Partnerships
	B1.8 Social media campaigns	B1.8.1 Water conservation media campaigns B1.8.2 Instagram's #EveryDropCounts B1.8.3 Infographics and videos	Communications and Partnerships
	B1.9 Art and multimedia installations	B1.9.1 Use art and multimedia installations to raise awareness about water conservation (as applicable)	Communications and Partnerships

Objective	Interventions	Activities	Responsibility
B1 Promote the efficient use of water to consumers and customers	B1.10 Community engagement programmes and political commitment	B1.10.1 Focus on involving the community in water conservation efforts through workshops, events, and volunteer opportunities B1.10.2 Hold annual workshops with Councillors B1.10.3 Submit annual progress report to Council B1.10.4 Hold discussions with other key stakeholders in environmental campaigns and explore the possibility of aligning each other's strategy	Communications and Partnerships
	B1.11 Volunteering	B1.11.1 Encourage volunteering to support water conservation efforts. Volunteers will play a key role in educating the community, assisting in projects, and promoting sustainable practices	Communications and Partnerships
B2 Regulate and enforce the prevention of wastage of water	B2.1 Enforcement of Water By-law and restrictions	B2.2.1 Resource the inspectorate team to ensure performance outside working hours B2.2.2 Maintain the existing corporate by-law contravention management system B2.2.3 Maintain and upgrade the existing SAP case management system (as required)	WDM, R&P
B3 Ensure the efficient use of water in new connections and developments	B3.1 Water use efficiency for developers and alternative water as per Water By-law	B3.1.1 In conjunction with the City's Urban Planning and Design Department, hold workshops and discussions with developers B3.1.2 Develop environmental recognition scheme for developers B3.1.3 Enhance the promotion of utilisation of alternative water such as grey water/rainwater/groundwater for non-potable use (toilet flushing and gardening) B3.1.4 Enforcement of water-related by-laws (sub-metering cluster or multi-tenant) and endorsement letter conditions	WDM, R&P
	B3.2 Revise engineering standards and township development policies	B3.2.1 Maintain engineering and township development standards B3.2.2 Monitor implementation of standards	WDM, R&P
	B3.3 Develop incentives for new consumers	B3.3.1 Develop WC/WDM rating scheme for new developments B3.3.2 Implement and manage the WC/WDM rating scheme	WDM, R&P
	B3.4 Develop sustainable service delivery programme for new consumers in low-income areas	B3.4.1 Memorandum of understanding and plumbing standards negotiations between the Western Cape Government Department of Infrastructure (Human Settlements) and the City B3.4.2 Promote the installation of water-efficient toilets and taps B3.4.3 Initial awareness, education and training of new consumers (workshops) B3.4.4 Ongoing effective monitoring, management and awareness measures	WDM, R&P Communications and Partnerships

Objective	Interventions	Activities	Responsibility
B4 Maintain equitable tariffs and informative billing	B4.1 Water services tariffs and structure	B4.1.1 Manage and maintain an effective water tariff structure B4.1.2 Revise tariff rates annually according to financial planning and marginal cost rates B4.1.3 Publicise new tariffs	Commercial Services
	B4.2 Monitor demand and inform consumers of large deviations	B4.2.1 Create a reporting system (integrated with current MIS) B4.2.2 Monitor trends and engage consumers	Customer Services
B5 Assist and capacitate consumers to be water efficient, including the implementation of leak repair and retrofitting projects	B5.1 Plumbing retrofit programme	B5.1.1 Research and evaluation of case studies and products throughout the world B5.1.2 Enhance the roll-out of retrofit projects throughout City on indigent properties	WDM, R&P Customer Services
	B5.2 Water-wise gardening scheme or zero-water demand gardening	B5.2.1 Develop at least 20 demonstration water-wise gardens throughout the city B5.2.2 Organise an ongoing water-wise garden campaign with the nursery industry and zero water demand gardening	Communications and Partnerships
	B5.3 Water audits for domestic consumers (indigent)	B5.3.1 Develop water audit procedure, print and distribute to any consumer on request B5.3.2 Hire and train a water audit task team B5.3.3 Manage the ongoing implementation	Customer Services
	B5.4 Support programme for large consumers	B5.4.1 Hire and train a 'large consumer' task team B5.4.2 Develop water audit guidelines for various industries B5.4.3 Identify and visit large consumers B5.4.4 Develop a forum for large consumers (meet twice per year) B5.4.5 Develop and implement joint ventures for water-efficient projects with large consumers B5.4.6 Provide assistance and technical know-how where possible B5.4.7 Introduce a compulsory water management plan for large consumers B5.4.8 Continue with waste minimisation programme (star ratings) B5.4.9 Test the accuracy of all top 100 large consumer meters	Communications and Partnerships WDM, R&P

Objective	Interventions	Activities	Responsibility
B6 Reduce and maintain low levels of inefficient water use by Council (internal money)	B6.1 Reduction of water use by the Recreation and Parks Department	B6.1.1 Provide support and expertise to park officials B6.1.2 Modification to efficient irrigation projects B6.1.3 Organise an ongoing water-wise garden campaign with the nursery industry and zero water demand gardening	Recreation and Parks Department Communications and Partnerships
	B6.2 Reduction of water used in Council-owned buildings	B6.2.1 Retrofit efficient plumbing fittings in all Council-owned buildings B6.2.2 Ongoing programmes to maintain water-efficient use targets achieved at each building B6.2.3 Implement and monitor awareness campaign at all Council buildings B6.2.4 Train maintenance and operations staff	WDM, R&P Facilities Management

7.3. Goal E – Target between 1% and 1,5% p.a. growth rate

Goal E: The City must by 2034/35 reduce and maintain the projected potable water demand to an average growth rate of between 1% and 1,5% p.a. (assuming a population growth rate between 1,6% and 2% p.a.).

Table 12: Goal E – Objective, interventions, activities and responsibility

Objective	Interventions	Activities	Responsibility
E1 Maximise the use of treated effluent for non-potable reuse	E1.1 Installations and modifications to infrastructure of treated effluent supply systems for non-potable use	E1.1.1 Implementation at Athlone E1.1.2 Implementation at Bellville E1.1.3 Implementation at Macassar E1.1.4 Implementation at Wildevoolvlei E1.1.5 Implementation at Cape Flats E1.1.6 Implementation at Mitchells Plain E1.1.7 Implementation at Potsdam E1.1.8 Implementation at Kraaifontein E1.1.9 Implementation at Fisantekraal E1.1.10 Implementation at Zandvliet E1.1.11 Implementation at Scottsdale	WDM, R&P
	E1.2 Operations, maintenance and effective management of the treated effluent systems	E1.2.1 Review the minimum level of service (LOS) E1.2.2 Quality testing and monitoring of treated effluent E1.2.3 Inspections of the treated effluent distribution systems E1.2.4 Installation of bulk meters for treated effluent balance E1.2.5 Testing and installing consumer meters E1.2.6 Reading of bulk meters and carrying out a monthly treated effluent water balance E1.2.7 Installing an MIS and updating new pipeline network on geographic information system E1.2.8 Increase the capacity of the treated effluent operations team's dedicated maintenance, monitoring and management staff E1.2.9 Enhance standard and specifications for treated effluent distribution networks	WDM, R&P Wastewater

Objective	Interventions	Activities	Responsibility
E1 Maximise the use of treated effluent for non-potable reuse	E1.3 Consumer and financial management of treated effluent	E1.3.1 Marketing to new potential consumers and formalising agreements E1.3.2 Formalising agreements with existing private, informal and City users of treated effluent E1.3.3 Consumer management and water audits E1.3.4 Revenue collection E1.3.5 Consumer and public awareness and information E1.3.6 Tariff review	WDM, R&P Customer Services Communications and Partnerships
E2 Promote alternative water resources and technologies for non-potable purposes	E2.1 Rain harvesting	E2.1.1 Implement projects (where feasible) E2.1.2 Assist in the development of an economical water tank E2.1.3 Promote roof tanks to other areas	WDM, R&P
	E2.2 Borehole or spring water reuse for non-potable purposes	E2.2.1 Carry out studies to identify feasible opportunities for spring water reuse for non-potable purposes E2.2.2 Promote and support borehole and well development by private individuals in appropriate areas E2.2.3 Install local boreholes for sports grounds, parks, etc. E2.2.4 Install spring water infrastructure for collections (non-potable use purposes) E2.2.5 Develop a monitoring system for groundwater resources used for non-potable purposes	WDM, R&P
	E2.3 Grey water reuse for non-potable purposes	E2.3.1 Review and maintain guidelines and regulations regarding the use of grey water E2.3.2 Studies on products to assist grey water reuse E2.3.3 Pilot project into grey water reuse E2.3.4 Promote the use of grey water	WDM, R&P
	E2.4 Stormwater harvesting for non-potable purposes	E2.4.1 Studies on stormwater harvesting for non-potable purposes	WDM, R&P
E3 Ensure the quality of treated effluent is of suitable standards	E3.1 Catchment management initiative	E3.1.1 Monitoring the discharge of effluent of large consumers	WDM, R&P
E4 Ensure the quality of treated effluent is of suitable standards and operated efficiently	E4.1 Ensure adequate effluent treatment plants	E4.1.1 Ongoing upgrades of WWTWs	Wastewater

Objective	Interventions	Activities	Responsibility
E4 Ensure the quality of treated effluent is of suitable standards and operated efficiently	E4.2 Ensure adequate maintenance of treatment plants	E4.2.1 Effective implementation of the asset management plan	Wastewater
	E4.3 Ensure adequate and efficient operation of treatment plants	E4.3.1 Ongoing resourcing required to improve operations	Wastewater
	E4.4 Set standards of effluent discharge for each plant	E4.4.1 Implement projects to comply with licence requirements per plant	Wastewater
	E4.5 Monitor the effluent discharge on an ongoing basis	E4.5.1 Ongoing sampling and reporting on performance per plant	Wastewater Scientific Services
	E4.6 Minimise the infiltration of rainwater into the effluent system	E4.6.1 Implement where feasible	Wastewater

8. Enabling objectives

These objectives will seek to overcome the existing constraints of WC/WDM and will seek to ensure that WC/WDM is implemented on an ongoing basis and is institutionalised within the existing functions of the City. These objectives are divided into two components: effective management and enabling resource objectives. The effective management objectives relate to activities that will manage and monitor the demand

targets and key performance indicators. Although these measures will not directly result in the reduction in demand, they are essential to ensure sustainability and access to necessary information. The enabling resource objectives refer to activities that will provide adequate financial resources, human resources and management protocols to ensure that the WC/WDM policies and goals are achieved.

8.1. Goal C – Effective management systems

Goal C: The City must ensure and maintain ongoing, effective management systems and water use efficiency measures.

Table 13: Goal C – Objective, interventions, activities and responsibility

Objective	Interventions	Activities	Responsibility
C1 Establish appropriate district management areas and monitor DMA water balances	C1.1 Optimise establishment of district management areas	Reticulation system: C1.1.1 DMA Implementation Programme C1.1.2 Smart Metering and Pressure Monitoring Programme (zone meters) C1.1.3 Real-time data analytics and monitoring programme C1.1.4 Zonal water balance and NRW management programme C1.1.5 Continuous improvement and DMA optimisation programme C1.1.6 Develop a zone management guide for City	WDM,R&P
		Bulk system: C1.1.7 Bulk zones monitoring programme C1.1.8 Smart Metering Programme (zone meters) C1.1.9 Install custody transfer meter, and measure and apportion non-revenue water between the bulk system and the reticulation system C1.1.10 Real-time data analytics and monitoring programme C1.1.11 Water balance and NRW management programme C1.1.12 Customer engagement and reporting programme	Bulk Water
	C1.2 Determine the various components of NRW monthly	C1.2.1 Improve demand analysis and determine the various NRW components' impact in accordance with IWA water balance model C1.2.2 Train staff to manage NRW analysis C1.2.3 Acquire additional data loggers C1.2.4 Acquire a suitable software model for a bottom-up analysis of real losses C1.2.5 Develop an apparent/commercial losses measurement method for the City's water balance C1.2.6 Upgrade and maintain telemetry for bulk water meters	Bulk Water Customer Services WDM, R&P

Objective	Interventions	Activities	Responsibility
C2 Ensure adequate information and policies to support decision making	C2.1 Management information systems	C2.1.1 Introduce an effective digital transformation and innovation policy (to include WC/WDM considerations) C2.1.2 Carry out a detailed investigation on the MIS needs and functionality required, and develop a comprehensive terms of reference for procurement C2.1.3 Acquire and implement the different modules of MIS; manage, update and maintain the MIS on an ongoing basis C2.1.4 Investigate the feasibility of a centralised data warehouse and platform providing citywide analysis and insights Management of advanced metering infrastructure: C2.1.5 Develop capacity and skills for a digital operations meter platform C2.1.6 Investigate the feasibility of a centralised data architecture and platform (resources and infrastructure) C2.1.7 Develop data analytics and evidence-based decision-making capabilities	Reticulation Bulk Water E&AM Customer Services Wastewater WDM, R&P
	C2.2 Enhanced asset management	C2.2.1 Upgrade and maintain the telemetry system C2.2.2 Maintain and monitor links between the telemetry system and the MIS system C2.2.3 Effective asset management of water infrastructure that directly or indirectly impact WC/WDM programmes in the City	Reticulation Bulk Water E&AM Wastewater WDM, R&P
	C2.3 Ongoing end-use and consumer behaviour research	C2.3.1 Carry out water audits and consumer behaviour, opinions and knowledge surveys C2.3.2 Carry out end-use research audits C2.3.3 Maintain information on demand analysis C2.3.4 Ongoing benchmarks of various consumers C2.3.5 Ongoing analysis of water audits, end-use analysis parameters and revised WC/WDM opportunities	WDM, R&P
	C2.4 Development of decision-making policies on WC/WDM	C2.4.1 Review and maintain policies, guidelines and best practice for the City C2.4.2 Inform all personnel of policies and train if required	All role players in W&S Directorate
C3 Monitor the impact of WC/WDM measures and KPIs	C 3.1 Monitor the impact of WC/WDM interventions	C 3.1.1 Monitor the impact of all WC/WDM on an ongoing basis	W&S Executive Director and directors
	C 3.2 KPI and benchmarks on WC/WDM	C3.2.1 Develop key benchmarks for all KPI and categories, and assign responsibility C3.2.2 Monitor the key benchmarks for all KPIs every six months	W&S Executive Director and directors

8.2. Goal D – Resources and funding

Goal D: The City must maintain WC/WDM as one of the key water service delivery strategies and must give priority to its implementation and ensure an ongoing, adequate enabling environment.

Table 14: Goal D – Objective, programme, interventions and responsibility

Objective	Interventions	Activities	Responsibility
D1 Ensure adequate financial resources	D1.1 Establish-ment of appropriate WC/WDM budgets	D1.1.1 Allocate an initial budget for WC/WDM in line with the strategy costing D 1.1.2 Develop an agreed methodology for calculating the financial savings achieved from the various WC/WDM measures	All role players in W&S Directorate
	D1.2 Seek funding and joint ventures	D1.2.1 Identify joint venture projects with DWS D1.2.2 Initiate funding opportunities internally and externally (partnership opportunities) D1.2.3 Hold discussions with water-intensive industries	All role players in W&S Directorate
D2 Ensure adequate human resources and processes	D2.1 Establish suitable teams in the Reticulation, Bulk Water, Customer Services, WDM, E&AM and Wastewater branches to focus on functions that directly reduce water demand	D2.1.1 Develop job descriptions and obtain approval for new positions D2.1.2 Advertise and fill new positions D2.1.3 Train and support capacity building of current and new staff	All role players in W&S Directorate
	D2.2 Review and maintain WC/WDM working procedures and responsibilities within the W&S Directorate	D2.2.1 Develop responsibilities for various sections and sign service level agreements between the various sections D2.2.2 Develop a WC/WDM working procedure D2.2.3 Determine new job functions within branches	All role players in W&S Directorate

9. Costing and budgets

The City requires R14,7 billion in WC/WDM initiatives over the next 10 years to enhance water use efficiency and achieve the objectives set in this strategy.

The proposed budget allocation for WC/WDM over the next 10 years, starting in the 2025/26 financial year, is as follows:

Table 15: Overall budget for WC/WDM (R million)

Financial year	WC/WDM CAPEX budget required	WC/WDM OPEX budget required	Total WC/WDM budget required	WC/WDM CAPEX budget planned (SAPPM)	WC/WDM budget shortfall
2025/26	932,17	131,27	1 063,45	748,67	314,78
2026/27	1 198,12	264,24	1 462,35	1 017,30	445,05
2027/28	1 193,39	286,81	1 480,19	905,76	574,44
2028/29	1 162,35	292,39	1 454,74	790,59	664,15
2029/30	1 052,14	308,62	1 360,76	768,29	592,47
2030/31	1 093,46	342,72	1 436,17	731,18	704,99
2031/32	1 125,79	360,20	1 486,00	661,30	824,70
2032/33	1 203,46	378,45	1 581,91	698,00	883,91
2033/34	1 264,25	406,15	1 670,41	730,30	940,11
2034/35	1 309,44	440,21	1 749,65	922,95	826,70
Total	11 534,57	3 211,05	14 745,63	7 974,33	6 771,30

WC/WDM is not a new programme in the City (see subsection 3.3). The ongoing interventions have been assigned budget aligned with the current resource limitations ('WC/WDM CAPEX budget plan (SAPPM)'). Approximately R8 billion has been planned for capital projects for the WC/WDM programme over the next 10 years. However, this revised strategy will require additional capital and operating budget allocations to achieve and maintain its stated objectives. The 'WC/WDM budget shortfall' column indicates the annual shortfall (the difference between column 3 and column 4). The City must allocate an additional R6,7 billion to WC/WDM interventions over the next 10 years to ensure the objectives and targets set in this strategy are achieved.

The potential savings are proportional to the budget required to implement new interventions and maintain

the existing water distribution network. It is expected that only 55% of the savings will be achieved if the 45% budget shortfall cannot be funded. Interventions will be prioritised, as described in this document, and it is expected that the pipe replacement (R4,5 billion) and consumer meter (AMI) (R4 billion) programmes would be most affected by the budget shortfall.

The estimated repair and maintenance budget for the next 10 years is shown in Table 16. The 2026 budget is based on the planned and actual budget available. The projected budget is based on the 2026 planned budget escalated at 5% per annum. The repairs and maintenance budget is required to maintain the existing network and WC/WDM initiatives. The budget must be reviewed annually to sustain and maintain new assets and WC/WDM initiatives.

Table 16: Repair and maintenance budget (R million)

Cost centre/group	Total	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
IS Water Basic Services	1,8%	50,51	53,04	55,69	58,47	61,40	64,46	67,69	71,07	74,63	78,36	635,31
Engineering and Asset Management	9,8%	279,21	293,17	307,83	323,22	339,38	356,35	374,17	392,87	412,52	433,14	3 511,86
Reticulation Water Distribution	52,2%	1 483,46	1 557,63	1 635,52	1 717,29	1 803,16	1 893,31	1 987,98	2 087,38	2 191,75	2 301,34	18 658,82
Treated Effluent	0,1%	2,55	2,68	2,81	2,95	3,10	3,25	3,42	3,59	3,77	3,95	32,06
Billing Management	0,1%	2,61	2,74	2,87	3,02	3,17	3,33	3,49	3,67	3,85	4,04	32,79
Debt Management	0,2%	5,46	5,74	6,02	6,32	6,64	6,97	7,32	7,69	8,07	8,47	68,70
Meter Management	9,2%	260,80	273,84	287,53	301,91	317,01	332,86	349,50	366,97	385,32	404,59	3 280,34
Bulk Water	25,8%	734,41	771,13	809,69	850,18	892,68	937,32	984,18	1 033,39	1 085,06	1 139,32	9 237,38
Water Demand Management	0,8%	23,90	25,10	26,35	27,67	29,06	30,51	32,03	33,64	35,32	37,08	300,67
Total	100,0%	2 842,92	3 013,49	3 194,30	3 385,96	3 589,12	3 804,47	4 032,73	4 274,70	4 531,18	4 803,05	35 757,93

The budgeted capital projects for WC/WDM interventions are summarised in Table 17. The projects include asset renewal, new projects and WC/WDM interventions. The biggest portion of the budget

(76%) is allocated towards the AMI roll-out and pipe replacement programmes. However, this does not cover all the capital requirements for the interventions outlined in this strategy.

Table 17: Planned capital budget (R million)

Interventions	% of total	Actual 2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
Asset renewal												
Treated effluent: Refurbishment and pipe links	0%	1,00	1,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	18,00
Pipe replacement	34%	240,97	305,23	314,32	300,04	286,35	283,00	236,00	236,00	249,80	249,80	2 701,50
Subtotal	34%	241,97	306,23	316,32	302,04	288,35	285,00	238,00	238,00	251,80	251,80	2 719,50
New capital projects												
Treated effluent: Re-use and upgrades	13%	84,07	115,58	131,20	132,35	95,84	96,18	78,30	102,00	110,50	110,15	1 056,17
Subtotal	13%	84,07	115,58	131,20	132,35	95,84	96,18	78,30	102,00	110,50	110,15	1 056,17
WC/WDM projects												
AMI roll-out programme	42%	309,73	500,00	413,53	300,00	300,00	300,00	300,00	300,00	300,00	300,00	3 323,26
Installation of data loggers	0%	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Leak detection equipment: Add	0%	6,00	0,00	0,00	0,00	0,00	5,00	0,00	0,00	0,00	0,00	11,00
Meter Replacement Programme	8%	88,90	80,00	27,00	27,00	27,00	27,00	27,00	40,00	50,00	240,00	633,90
Pressure management	2%	10,00	7,50	9,70	21,20	40,10	10,00	10,00	10,00	10,00	10,00	138,50

Interventions	% of total	Actual 2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
PRV controllers and data loggers	0%	0,00	0,00	0,00	0,00	9,00	0,00	0,00	0,00	0,00	0,00	9,00
Telemetry and automation	0%	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	4,00	31,00
Upgrade reservoirs citywide	1%	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	50,00
Water meter (reticulation)	0%	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Training	0%	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	2,00	2,00
Subtotal	53%	422,63	595,50	458,23	356,20	384,10	350,00	345,00	358,00	368,00	561,00	4 198,66
Total	100%	748,67	1 017,30	905,76	790,59	768,29	731,18	661,30	698,00	730,30	922,95	7 974,33

9.1. Budget breakdown by goal

Most of the costing and budgets indicated for the various programmes and projects in the table below are based on latest available researched estimates or the latest budget on SAP Portfolio Project Management or estimates from the implementing branch/section. The budgets should be used as a guideline and should be reviewed on an annual basis and updated as more information becomes available. The following costing principles and assumptions were made in developing the budgets:

1. Costs of staff resources that are currently employed have not been included.
2. Costs of professional service providers that would need to be subcontracted have been included where deemed necessary.
3. All costs associated with the New Water Resources Programme infrastructure are excluded from this framework.
4. Wastewater treatment works upgrades (capital and operating) costs are excluded.
5. Primary operation and maintenance costs by branches responsible for implementation of WC/WDM measures are included.

A summary of the costs for the various objectives and programmes is illustrated in the tables below.

Table 18: Goal A – Strategy cost

Interventions		Budget x R1 000 from cost tables										
		2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	Total
A1.1	Optimised pressure reduction	26 500	20 795	19 478	24 054	24 822	21 835	24 749	25 713	26 683	27 711	242 340
A1.2	Enhance active leak detection and repairs	22 450	20 820	23 386	26 198	27 719	29 331	38 973	32 850	34 771	36 807	293 305
A2.1	Implementation of comprehensive water management programmes in low-income areas and informal settlement areas	33 606	35 231	36 938	38 880	40 611	42 587	44 661	47 089	49 126	51 527	420 257
A2.2	Fix-it domestic leaks	8 200	9 400	10 780	12 367	14 192	16 341	18 754	21 530	24 722	28 443	164 730
A2.3	Implementation of the debt management policy	4 300	5 365	6 341	7 509	8 909	10 586	12 596	15 005	17 893	21 355	109 858
A3.1	Enhanced rehabilitation of the reticulation network (pipe and service connection replacement)	379 159	465 272	486 186	518 817	551 806	587 234	624 189	661 760	701 045	743 148	5 718 617

Interventions		Budget x R1 000 from cost tables										
		2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	Total
A3.2	Preventative maintenance on reticulation system	35 000	40 250	46 288	53 231	61 215	70 398	80 957	93 101	107 066	123 126	710 630
A3.3	Preventative maintenance on bulk system	18 500	21 275	35 266	28 136	32 357	52 210	44 292	49 210	56 592	65 081	402 919
A3.4	Passive leakage control reticulation (corporate call centre)	2 000	2 140	2 290	2 450	2 622	2 805	3 001	3 212	3 436	3 677	27 633
A3.5	Maintain uniform operations and maintenance procedures (reticulation)	2 000	2 300	2 645	3 042	3 498	4 023	4 626	5 320	6 118	7 036	40 607
A4.1	Commercial data validation	-	-	-	-	-	-	-	-	-	-	-
A4.2	Meter management and replacement programme	380 000	580 000	555 834	477 050	327 050	327 050	327 050	340 050	350 050	350 050	4 014 184
A4.3	Billing exception reports	500	500	500	500	500	500	500	500	500	500	5 000
A4.4	Management of large-consumer meters	1 150	1 150	1 150	1 150	1 150	1 150	1 150	1 150	1 150	1 150	11 500
A4.5	Reduce illegal connections	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	10 000
A4.6	Manage meter readings	-	-	-	-	-	-	-	-	-	-	-
A5.1	Verification of system input volume	9 000	9 600	9 600	9 600	9 000	9 000	9 000	9 000	9 000	9 000	91 800

Table 19: Goal B – Strategy cost

Interventions		Budget x R1 000 from cost tables										
		2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	Total
B1.1	Consumer awareness campaign	632	676	724	774	828	886	948	1 015	1 086	1 162	8 732
B1.2	Consumer education campaign	430	460	492	527	564	603	645	690	739	791	5 941
B1.3	School education	210	975	990	1 007	1 025	1 045	1 065	1 087	1 111	1 136	9 651
B1.4	Special events	330	353	378	404	433	463	495	530	567	607	4 559
B1.5	Water-related forums	-	-	-	-	-	-	-	-	-	-	-
B1.6	Introduction of virtual reality and augmented reality (AR) experiences	-	-	-	1 500	-	-	-	2 500	-	-	4 000
B1.7	Utilisation of mobile applications	297	318	340	364	389	417	446	477	510	546	4 103
B1.8	Social media campaigns	450	482	515	551	590	631	675	723	773	827	6 217
B1.9	Art and multimedia installations	500	535	572	613	655	701	750	803	859	919	6 908
B1.10	Community engagement programmes	500	785	672	720	950	824	881	1 153	1 009	1 080	8 574
B1.11	Volunteering	250	268	286	306	328	351	375	401	430	460	3 454
B2.2	Enforcement of Water By-law and restrictions	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	1 000	10 000
B3.1	Water use efficiency for developers and alternative water as per Water By-law	-	-	-	-	-	-	-	-	-	-	-
B3.2	Revise engineering standards and township development policies	-	-	-	-	-	-	-	-	-	-	-
B3.3	Develop incentives for new consumers	-	-	250	700	700	700	700	700	700	700	5 150
B3.4	Develop sustainable service delivery programme for new consumers in low-income areas	450	450	450	450	1 050	1 100	1 150	1 200	1 250	1 350	8 900

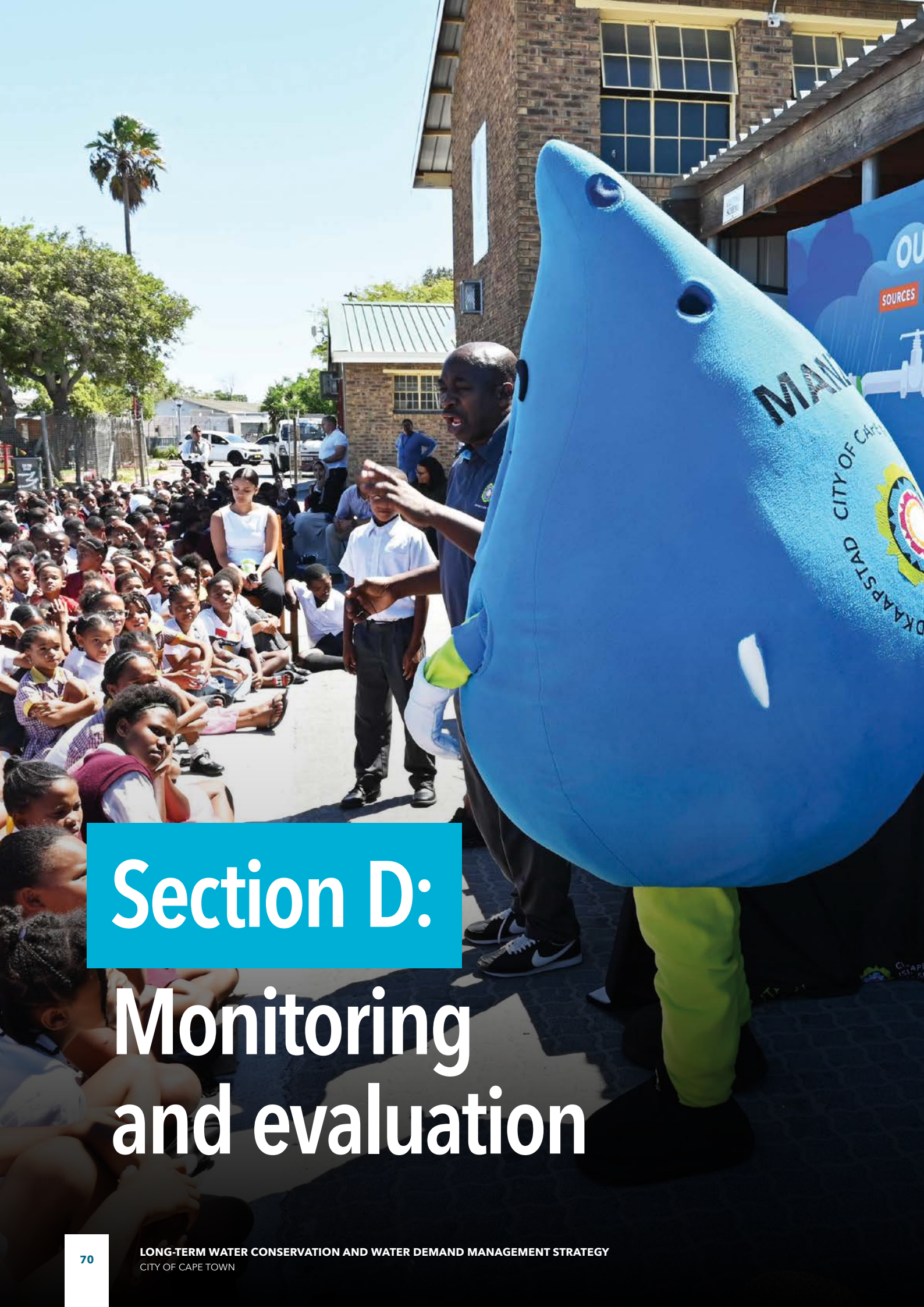
Interventions		Budget x R1 000 from cost tables										
		2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	Total
B4.1	Review water tariffs	-	-	-	-	-	-	-	-	-	-	-
B4.2	Informative billing	-	-	-	-	-	-	-	-	-	-	-
B4.3	Monitoring demand and notifying consumers	-	-	-	-	-	-	-	-	-	-	-
B4.4	Insurance scheme for leaks	-	-	-	250	250	-	-	-	-	-	500
B5.1	Implement plumbing retrofit	500	500	500	500	500	500	500	500	500	500	5 000
B5.2	Implement a water-wise gardening scheme	-	-	-	-	-	-	-	-	-	-	-
B5.3	Introduce water audit for domestic consumers	-	350	350	350	350	350	350	350	350	350	3 150
B5.4	Implement an ongoing support programme for large consumers	-	700	910	910	910	910	910	910	910	910	7 980
B6.1	Increase water efficiency by the Parks Department	1 500	1 500	1 500	1 500	1 500	1 500	1 500	1 500	1 500	1 500	15 000
B6.2	Increase efficiency in Council-owned buildings	-	4 780	4 780	4 780	4 780	4 780	4 780	4 780	4 780	4 780	43 020

Table 20: Goal E – Strategy cost

Interventions		Budget x R1 000 from cost tables										
		2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	Total
E1.1	Installations and modifications to infrastructure of treated effluent supply systems for non-potable use	86 560	68 367	67 502	76 100	81 000	87 900	78 296	102 000	110 500	110 150	868 376
E1.2	Operations, maintenance and effective management of the treated effluent systems	950	3 530	4 030	3 530	4 530	5 030	4 530	4 530	5 530	5 030	41 220
E1.3	Consumer and financial management of treated effluent	650	1 400	900	900	900	900	1 400	900	900	900	9 750
E2.1	Rain harvesting	-	-	-	-	-	-	-	-	-	-	-
E2.2	Borehole or spring water reuse for non-potable purposes	25	25	25	25	25	25	25	25	25	25	250
E2.3	Grey water reuse for non-potable purposes	-	-	-	100	100	500	-	-	-	-	700
E2.4	Stormwater harvesting for non-potable purposes	-	-	-	-	-	-	-	-	-	-	-
E3.1	Catchment management initiative	-	-	-	-	-	-	-	-	-	-	-
E4.1	Ensure adequate effluent treatment plants	-	-	-	-	-	-	-	-	-	-	-
E4.2	Ensure adequate maintenance of treatment plants	-	-	-	-	-	-	-	-	-	-	-
E4.3	Ensure adequate and efficient operation of treatment plants	-	-	-	-	-	-	-	-	-	-	-
E4.4	Set standards of effluent discharge for each plant	-	-	-	-	-	-	-	-	-	-	-
E4.5	Monitor the effluent discharge on an ongoing basis	-	-	-	-	-	-	-	-	-	-	-
E4.6	Minimise the infiltration of rainwater into the effluent system	-	-	-	-	-	-	-	-	-	-	-

Table 21: Goals C and D – Strategy cost

	Interventions	Budget x R1 000 from cost tables										
		2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	Total
C1.1	Establish district management areas	27 000	20 000	16 500	14 000	12 000	10 000	10 000	8 500	7 000	6 000	131 000
C1.2	Determine UaW	350	1 850	850	850	850	850	850	850	850	850	9 000
C2.1	Management Information System	-	-	-	-	-	-	-	-	-	-	-
C2.2	Upgrade the telemetry system, remote communications (cell)	17 000	17 000	17 000	17 000	17 000	17 000	17 000	17 000	17 000	17 000	170 000
C2.3	Ongoing end-use/consumer behaviour research	-	450	495	545	599	659	725	797	877	965	6 111
C3.1	Monitor the impact of WC/WDM interventions	-	-	-	-	-	-	-	-	-	-	-
C3.2	KPI and benchmarks on WC/WDM	-	-	-	-	-	-	-	-	-	-	-
D1.1	Obtain appropriate WC/WDM funding	-	-	-	-	-	-	-	-	-	-	-
D1.2	Seek funding and joint ventures	-	-	-	-	-	-	-	-	-	-	-
D2.1	Establish suitable teams in the Reticulation, Bulk Water, Customer Services, WDM, E&AM and Wastewater branches to focus on functions that directly reduce water demand	500	120 500	120 500	120 500	120 500	120 500	120 500	120 500	120 500	120 500	1 085 000
D2.2	Review and maintain WC/WDM working procedures and responsibilities within the W&S Directorate	-	-	-	-	-	-	-	-	-	-	-



Section D:

Monitoring and evaluation

10. Overview

The effectiveness of the WC/WDM Strategy will be monitored through various internal reporting mechanisms, such as reports to directors and the Portfolio Committee. In addition, external assessments will be used to validate the progress. These include but are not limited to the list below.

10.1. 'No Drop' assessment

The City is expected to participate in the 'No Drop' Programme of the DWS that consists of a set of criteria that is used to assess, verify and validate the City's water use efficiency.

10.2. 'Blue Drop' assessment

The City's WC/WDM Strategy is part of the assessment criteria for the 'Blue Drop' certification that is undertaken by the DWS annually to assess all processes associated with treating and conveying water to the customer.

10.3. DWS regulatory requirements

The City submits the water balance to the DWS on a quarterly basis.

10.4. Circular 88: National Treasury

The City reports on the performance of key water demand management KPIs, such as active leak detections and repair progress and cost, water infrastructure rehabilitation progress and costs.

10.5. Monthly water balance

The City compiles, and reports on, the water balance monthly to ensure that all water supplied to the City is accounted for.

10.6. SDBIP targets

The SDBIP targets emanate from the IDP. The targets are set and reviewed annually to monitor the progress of various municipal interventions, including WC/WDM performance indicators.

Conclusion

To prevent the increase in NRW and to ensure water use efficiency, the City must commit to the implementation of this WC/WDM Strategy and provide all human and financial resources required.

The following key objectives have been covered in this review:

- The roles and responsibilities of branches within the Water and Sanitation Directorate have been clarified and this will assist in effectively implementing the WC/WDM Strategy.
 - This strategy provides a clear line of sight for implementing and reporting on WC/WDM interventions, both internally and externally.
 - This strategy is updated in line with City priorities, including the City Water Strategy (2019) and Treated Effluent Master Plan for non-potable reuse (2021).
 - Water resource-related information has been removed from this updated strategy and the focus is on City's WC/WDM measures.
 - High-level asset management interventions are included in this strategy.
- d. WC/WDM activities should be integrated and monitored over the next 10 years to reduce non-revenue water, account for all components of the City water balance, and maintain total water demand at acceptable levels.
 - e. This strategy should be used for capital and operating budget motivation over the next 10 years.
 - f. The strategy should be regularly reviewed to incorporate the latest available information and to reprioritise the implementation of various programmes.
 - g. Ongoing studies on water consumption patterns should be done periodically to update key behavioural information and relevant data to enable data-driven decision making.
 - h. Attention should be given to the necessary human resource requirements to enable the successful implementation of the WC/WDM Strategy.
 - i. Ongoing wastewater treatment works upgrades must continue to improve effluent quality for effective implementation of the treated effluent non-potable reuse strategy and master plan.

Recommendations

The following are some of the key recommendations of the WC/WDM Strategy:

- a. The City must commit to maintain the implementation of WC/WDM as one of City's key strategies.
 - b. Attention should be given to address all the proposed WC/WDM-related programmes and projects described in the strategy.
 - c. The proposed budget should be allocated to WC/WDM programmes over the next 10 years.
- The following are recommendations that require further research:
- j. The City must engage in studies to further apportion apparent losses;
 - k. The City should investigate measures to account for water used and improve water use efficiency in informal settlements; and
 - l. The City must investigate opportunities to integrate monitoring and reporting on programmes from production to the customer on a single platform.

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