OVERSTRAND MUNICIPALITY

Annual Water Services Development Plan Performance- and Water Services Audit Report

as directed by the Water Services Act (Act 108 of 1997) and the Regulations relating to Compulsory National Standards and Measures to Conserve Water

FY 2022/2023

23 OCTOBER 2023

OVERSTRAND MUNICIPALITY

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Draft	Draft 2022/2023 Annual WSDP Performance- and Water Services Audit Report	10 October 2023	Project No. P09233
Approval	Final 2022/2023 Annual WSDP Performance- and Water Services Audit Report	Will be submitted with Annual Report	The Municipality will forward the Council Resolution for the approval of the WSDP Performance- and Water Services Audit Report to the DWS.

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PROJECT P09233 - OVERSTRAND MUNICIPALITY: ANNUAL WSDP PERFORMANCE AND WATER SERVICES AUDIT REPORT FOR 2022/2023

REV	DESCRIPTION	ORIG	REVIEW	iX ENGINEERS	DATE	CLIENT APPROVAL	DATE
Draft	Draft issued for external review	R Kuffner	JT Human		9/10/2023		9/10/2023
		Author	A Reviewer	Approval		Approval	
Final	Final for approval by Council	R Kuffner	JT Human		23/10/2023		23/10/2023
		Author	A Reviewer	Approval		Approval	

FOREWORD:

Overstrand Municipality is required in terms of Section 18 of the Water Services Act, 1997 (Act No.108 of 1997), as well as the "Regulations relating to compulsory national standards and measures to conserve water", as issued in terms of sections 9(1) and 73(1)(j) of the Water Services Act, to report on the implementation of its WSDP during each financial year and to include a water services audit in such an annual report.

The WSDP Performance- and Water Services Audit is designed to monitor the compliance of Overstrand Municipality with these regulations. It also assists the communities within Overstrand Municipality's Management Area and the DWS to assess how well the Municipality is performing relative to their stated intentions and their capacity. The WSDP Performance- and Water Services Audit Report can be seen as an annexure to the Municipality's Annual Report. The Annual Report is compiled as required by the Local Government Municipal Systems Act, Act no 32 of 2000 (Section 46) and the Local Government: Municipal Finance Management Act, Act no 56 of 2003 (Section 121).

Overstrand Municipality's Vulnerability Index for 2023 was indicated as 0.23 "Low Vulnerability" in the latest Municipal Strategic Self-Assessment Report. The vulnerability of all the KPIs for the 2023 assessment were low, except for Information Management and Technical Staff Capacity, which were both indicated as Moderate Vulnerability, and Financial Asset Management, which were indicated as High vulnerability.

A Water and Wastewater Bulk Works Contract between Overstrand Municipality and Veolia Water Solutions & Technologies South Africa (Pty) Ltd is in place to operate and maintain the bulk infrastructure in Overstrand Municipality's Management Area for a period of fifteen (15) years (Signed on the 8th of December 2018). The Municipality also has the right to extend the contract for a further five (5) years.

The water and sanitation services of Overstrand Municipality is managed in a financially sustainable manner, with a surplus generated on the operation and maintenance budgets of these two services combined for the last financial year.

Overstrand Municipality also successfully completed various capital projects over the last financial year. The capital budget expenditure, for the 2022/2023 financial year, was R31.608 million (88.3% of the budget) for the water infrastructure projects and R31.123 million (99.5% of the budget) for the sewerage infrastructure projects.

The implementation of the Municipality's WDM Strategy and Action Plan have been extremely successful, with the overall raw water requirements for all the systems reduced from 9 206 Ml in 2008/2009 to 7 028 Ml in 2011/2012 (annual decrease of -8.6% over three-year period) and a further steady increase over the last eleven years to 8 160 Ml in 2022/2023 (average annual increase of 1.37% over last eleven years). The overall NRW for all the systems for the 2022/2023 financial year was 1 841 Ml (24.48%). The overall water losses were 1 733 Ml (23.04%).

The Western Cape experienced a severe drought over the period 2015 to 2017, with some relief during the 2018 to 2022 winter months. The drought over the period 2015 to 2017 reduced the safe yield of the Municipality's own existing surface and groundwater resources. The Municipality therefore continued with the implementation of various WC/WDM measures to lower the current and future water requirements and investigations of augmentation options for the existing water resources.

Comprehensive Operational and Compliance Water Quality and Final Effluent Monitoring Programmes are implemented by Overstrand Municipality. The water quality of all the water distribution systems in Overstrand Municipality was "Excellent", except for the "Operational Efficiency" indicator for the Buffels River system and the "Aesthetic" indicator for the Buffeljags Bay system that were categorised as "Unacceptable" (According to the SANS 241:2015 classification).

The overall percentage compliance of the water quality samples taken over the period July to June for the last three financial years are indicated in the table below.

Overall Percentage Compliance of the Water Quality Samples Taken Over the Period July to June for the Last Three Financial Years															
Distribution System	Acute Health (%)						Chronic Health (%)			Aesthetic (%)			Operational Efficiency (%)		
	Microbiological			Chemical											
	22/23	21/22	20/21	22/23	21/22	20/21	22/23	21/22	20/21	22/23	21/22	20/21	22/23	21/22	20/21
All Systems	99.4	99.1	99.9	100.0	100.0	100.0	99.6	99.9	100.0	98.6	99.3	99.4	96.0	97.2	97.4

The overall percentage compliances of the final effluent samples taken over the last three financial years are summarised in the table below.

Overall Percentage Compliance of the Final Effluent Samples Taken Over the Last Three Financial Years									
WWTW	Microbiological (%)			Chemical (%)			Physical (%)		
	22/23	21/22	20/21	22/23	21/22	20/21	22/23	21/22	20/21
All WWTWs	69.4	83.3	100.0	72.6	78.5	85.4	77.3	84.3	80.1

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

The Municipality has maintained a high and consistent level of service to its urban water consumers. After hours emergency requests are being dealt with by the control room on a twenty-four hour per day basis. Requests are furthermore captured on an electronic mail or works-order system to ensure the execution thereof.

The Municipality completed the updating of their Water Supply and Sanitation Services By-law during the 2021/2022 financial year. The WSDP was updated for the next five-year WSDP cycle. The Municipality also performed excellent with DWS's 2021 Blue Drop Risk Assessments (All plants were in the low risk category) and the 2021 Green Drop Assessments (Sterling performance with an overall Green Drop Score of 89% and the Gansbaai, Hermanus and Stanford WWTWs were serious contenders for Green Drop Certification). The latest Blue and Green Drop assessments (2022) still need to be published by the DWS.

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WATER SERVICES AUDIT FOR 2022/2023

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ABBREVIATIONS AND DEFINITIONS

AADD	Average Annual Daily Demand
BDRR	Blue Drop Risk Rating
BDS	Blue Drop System
C	Chemical
CAH	Chemical Acute Health
CBD	Central Business District
CCH	Chemical Chronic Health
CF	Consequence of Failure
CNA	Chemical Non Health Aesthetic
COD	Chemical Oxygen Demand
CRC	Current Replacement Cost
CRR	Cumulative Risk Ratio
CU	Consumer Unit
CV	Carrying Value
CWDP	Coastal Water Discharge Permit
DAFF	Dissolved Air Flotation and Filtration
DEA & DP	Department of Environmental Affairs and Development Planning
DLG	Department of Local Government
DO	Dissolved Oxygen
DRC	Depreciated Replacement Cost
DWQ	Drinking Water Quality
DWS	Department of Water and Sanitation
EC	Electrical Conductivity
ESETA	Energy Sector Education and Training Authority
ESKOM	Electricity Supply Commission
GAMAP	Generally Accepted Municipal Accounting Policies
GIS	Geographic Information Systems
HH	Household
HIV	Human Immunodeficiency Virus
HL	High Level
HOA	Home Owner Association
IAM	Infrastructure Asset Management
ICT	Information and Communications Technology
IDP	Integrated Development Plan
ILI	Infrastructure Leakage Index
IMQS	Infrastructure Management Query System
IRIS	Integrated Regulatory Information System
IT	Information Technology
IWA	International Water Association
kl	Kilolitre
KPA	Key Performance Area
KPI	Key Performance Indicator
l/c/d	Litre per Capita per Day
LF	Likelihood of Failure
LGSETA	Local Government Sector Education and Training Authority

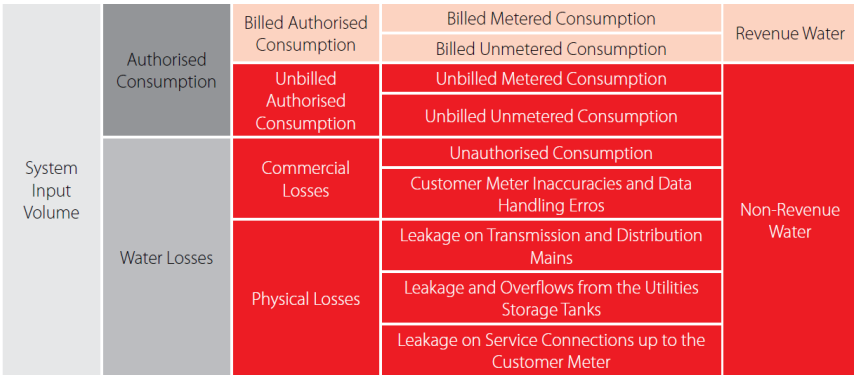
ABBREVIATIONS AND DEFINITIONS / CONTINUE

LGTAS	Local Government Turn Around Strategy
LL	Low Level
LM	Local Municipality
l/p/d	Litre per Person per Day
M	Microbiological
m³/a	Cubic Metre per Annum
MAH	Microbiological Acute Health
MCC	Motor Control Centre
MFMA	Municipal Finance Management Act
MIG	Municipal Infrastructure Grant
MISA	Municipal Infrastructure Support Agent
Ml	Mega Litre
Ml/a	Mega Litre per Annum
Ml/d	Mega Litre per Day
MLSS	Mixed Liquor Suspended Solids
MTREF	Medium Term Revenue Expenditure Framework
MuSSA	Municipal Strategic Self-Assessment
NRW	Non-Revenue Water
O	Operational
O&M	Operation and Maintenance
P	Physical
PAT	Progress Assessment Tool
PC	Process Controller
PDA	Previously Disadvantaged Areas
PFD	Process Flow Diagram
PRP	Pipe Replacement Potential
PRV	Pressure Reducing Valve
PS	Pump Station
PV	Photovoltaics
RDP	Reconstruction and Development Programme
RO	Reverse Osmosis
RUL	Remaining Useful Life
SALGA	South African Local Government Association
SANS	South African National Standard
SCADA	Supervisory Control and Data Acquisition
SDBIP	Service Delivery and Budget Implementation Plan
SDF	Spatial Development Framework
SWRO	Sea Water Reverse Osmosis
TDS	Total Dissolved Solids
TMG	Table Mountain Group
VIP	Ventilated Improved Pit
WC/WDM	Water Conservation / Water Demand Management
WDM	Water Demand Management
WHO	World Health Organisation

ABBREVIATIONS AND DEFINITIONS / CONTINUE

WMA	Water Management Area
WRC	Water Research Commission
WSA	Water Services Authority
WSDP	Water Services Development Plan
WSI	Water Services Institution
WSIG	Water Services Infrastructure Grant
WSP	Water Services Provider
WSS	Water Supply System
WTW	Water Treatment Works
WULA	Water Use Licence Application
W_2RAP	Wastewater Risk Abatement Plan
WWTW	Wastewater Treatment Works

KEY TERMS AND INTERPRETATIONS

KEY TERMS	INTERPRETATIONS
Current replacement cost (CRC)	The cost of replacing the service potential of an existing asset, by reference to some measure of capacity, with an appropriate modern equivalent asset. GAMAP defines CRC as the cost the entity would incur to acquire the asset on the reporting date.
Depreciated Replacement Cost (DRC)	The replacement cost of an existing asset after deducting an allowance for wear or consumption to reflect the remaining economic life of the existing asset.
Financial Year	Financial year means in relation to- • a national or provincial department, the year ending 31 March; or • a municipality, the year ending 30 June.
Integrated Development Plan (IDP)	An IDP is a legislative requirement for municipalities, which identifies the municipality's key development priorities; formulates a clear vision, mission and values; formulates appropriate strategies; shows the appropriate organisational structure and systems to realise the vision and the mission and aligns resources with the development priorities.
International Water Association (IWA) Water Balance	
System Input Volume	The volume of treated water input to that part of the water supply system to which the water balance calculation relates.
Authorised Consumption	The volume of metered and/or un-metered water taken by registered customers, the water supplier and others who are implicitly or explicitly authorised to do so by the water supplier, for residential, commercial and industrial purposes. It also includes water exported across operational boundaries. Authorised consumption may include items such as firefighting and training, flushing of mains and sewers, street cleaning, watering of municipal gardens, public fountains, frost protection, building water, etc. These may be billed or unbilled, metered or unmetered.
Water Losses	The difference between System Input and Authorised Consumption. Water losses can be considered as a total volume for the whole system, or for partial systems such as transmission or distribution schemes, or individual zones. Water Losses consist of Physical Losses and Commercial Losses (also known as Real Losses and Apparent Losses).
Billed Authorised Consumption	Those components of Authorised Consumption which are billed and produce revenue (also known as Revenue Water). Equal to Billed Metered Consumption plus Billed Unmetered Consumption.
Unbilled Authorised Consumption	Those components of Authorised Consumption which are legitimate but not billed and therefore do not produce revenue. Equal to Unbilled Metered Consumption plus Unbilled Unmetered Consumption.
Commercial Losses	Includes all types of inaccuracies associated with customer metering as well as data handling errors (meter reading and billing), plus unauthorised consumption (theft or illegal use). Commercial losses are called "Apparent Losses" by the International Water Association and in some countries the misleading term "Non-Technical Losses" is used.
Physical Losses	Physical water losses from the pressurized system and the utility's storage tanks, up to the point of customer use. In metered systems this is the customer meter, in unmetered situations this is the first point of use (stop tap/tap) within the property. Physical losses are called "Real Losses" by the International Water Association and in some countries the misleading term "Technical Losses" is used.
Billed Metered Consumption	All metered consumption which is also billed. This includes all groups of customers such as domestic, commercial, industrial or institutional and also includes water transferred

KEY TERMS	INTERPRETATIONS
	across operational boundaries (water exported) which is metered and billed.
Billed Unmetered Consumption	All billed consumption which is calculated based on estimates or norms but is not metered. This might be a very small component in fully metered systems (for example billing based on estimates for the period a customer meter is out of order) but can be the key consumption component in systems without universal metering. This component might also include water transferred across operational boundaries (water exported) which is unmetered but billed.
Unbilled Metered Consumption	Metered Consumption which is for any reason unbilled. This might for example include metered consumption by the utility itself or water provided to institutions free of charge, including water transferred across operational boundaries (water exported) which is metered but unbilled.
Unbilled Unmetered Consumption	Any kind of Authorised Consumption which is neither billed nor metered. This component typically includes items such as fire-fighting, flushing of mains and sewers, street cleaning, frost protection, etc. In a well-run utility it is a small component which is very often substantially overestimated. Theoretically this might also include water transferred across operational boundaries (water exported) which is unmetered and unbilled – although this is an unlikely case.
Unauthorised Consumption	Any unauthorised use of water. This may include illegal water withdrawal from hydrants (for example for construction purposes), illegal connections, bypasses to consumption meters or meter tampering.
Customer Metering Inaccuracies and Data Handling Errors	Commercial water losses caused by customer meter inaccuracies and data handling errors in the meter reading and billing system.
Leakage on Transmission and /or Distribution Mains	Water lost from leaks and breaks on transmission and distribution pipelines. These might either be small leaks which are still unreported (e.g., leaking joints) or large bursts which were reported and repaired but did obviously leak for a certain period before that.
Leakage and Overflows at Utility's Storage Tanks	Water lost from leaking storage tank structures or overflows of such tanks caused by e.g. operational or technical problems.
Leakage on Service Connections up to point of Customer Metering	Water lost from leaks and breaks of service connections from (and including) the tapping point until the point of customer use. In metered systems this is the customer meter, in unmetered situations this is the first point of use (stop tap/tap) within the property. Leakage on service connections might be reported breaks but will predominately be small leaks which do not surface and which run for long periods (often years).
Revenue Water	Those components of Authorised Consumption which are billed and produce revenue (also known as Billed Authorised Consumption). Equal to Billed Metered Consumption plus Billed Unmetered Consumption.
Non-Revenue Water	Those components of System Input which are not billed and do not produce revenue. Equal to Unbilled Authorised Consumption plus Physical and Commercial Water Losses.
Municipal Finance Management Act (MFMA)	Municipal Finance Management Act, 2003 (Act No. 56 of 2003)
MIG	A conditional grant from national government to support investment in basic municipal infrastructure.
Remaining useful life (RUL)	The time remaining over which an asset is expected to be used.
Service Delivery Budget Implementation Plan (SDBIP)	The SDBIP is a management, implementation and monitoring tool that enable the Municipal Manager to monitor the performance of senior managers, the Mayor to monitor the performance of the Municipal Manager, and for the community to monitor the performance of the municipality.
Strategic Framework for Water Services	The Strategic Framework provides a comprehensive summary of policy with respect to the water services sector in South Africa and sets out a strategic framework for its implementation over the next ten years.
Water Conservation	The minimisation of loss or waste, the care and protection of water resources and the efficient and effective use of water.
Water Demand Management	The adaptation and implementation of a strategy by a water institution or consumer to influence the water demand and usage of water in order to meet any of the following objectives: economic efficiency, social development, social equity, environmental protection, sustainability of water supply and services, and political acceptability.
Water Services Authority (WSA)	A water services authority means a municipality with the executive authority and the right to administer water services as authorised in terms of the Municipal Structures Act, 1998 (Act No.117 of 1998). There can only be one water services authority in any specific area. Water services authority area boundaries cannot overlap. Water services authorities are

KEY TERMS	INTERPRETATIONS
	metropolitan municipalities, district municipalities and authorised local municipalities.
Water Services Development Plan (WSDP)	A plan to be developed and adopted by the WSA in terms of the Water Services Act, 1997 (Act No.108 of 1997)
WSDP Guide Framework	Modular tool which has been developed by the DWS to support WSAs in complying with the Water Services Act with respect to Water Services Development Planning and which is also used by the DWS to regulate such compliance.
Water Services Provider (WSP)	A WSP means any person or institution who provides water services to consumers or to another water services institution, but does not include a water services intermediary.

OVERSTRAND MUNICIPALITY

ANNUAL WSDP PERFORMANCE AND WATER SERVICES AUDIT REPORT FOR 2022/2023

EXECUTIVE SUMMARY

Overstrand Municipality is required in terms of Section 18 of the Water Services Act, 1997 (Act No.108 of 1997), as well as the "Regulations relating to compulsory national standards and measures to conserve water", as issued in terms of sections 9(1) and 73(1)(j) of the Water Services Act, to report on the implementation of its WSDP during each financial year and to include a water services audit in such an annual report.

Section 62 of the Water Services Act further requires the Minister to monitor every WSI in order to ensure compliance with the prescribed national standards. This regulation requires a WSA to complete and submit a WSDP Performance- and Water Services Audit Report every financial year.

The WSDP Performance- and Water Services Audit is designed to monitor the compliance of the WSA and other WSIs with these regulations. The Water Services Act allows the audit to be used as a tool to compare actual performance of the WSA against the targets and indicators set in their WSDP. The WSDP Performance- and Water Services Audit also assists local communities and DWS to assess how well WSAs are performing relative to their stated intentions and their capacity.

The WSDP Performance- and Water Services Audit Report will give an overview of the implementation of the Municipality's previous year's WSDP, for the 2022/2023 financial year, and can be seen as an annexure to Overstrand Municipality's Annual Report. The Annual Report is compiled as required by the Local Government: Municipal Systems Act, Act no 32 of 2000 (Section 46) and the Local Government: Municipal Finance Management Act, Act no 56 of 2003 (Section 121).

Availability of the Water Services Audit Report: The WSDP Performance- and Water Services Audit Report is a public document and must be made available within four months after the end of each financial year and must be available for inspection at the offices of the WSA. It is also recommended that the document be placed on the Municipality's website and that copies of the document be placed at the public libraries. The Water Services Audit Report also needs to be made available to the Minister of the DWS, the Minister of the Department of Cooperative Governance, the Province and to SALGA, as required by the Water Services Act, 1997.

The WSDP Performance- and Water Services Audit Report include the following detail information:

- The Municipality's performance with regard to their KPIs for water and sewerage services for the 2022/2023 financial year, as included in the Municipality's SDBIP.
- The Municipality's Performance with regard to DWS's Blue and Green Drop Assessments. Blue drop status is awarded to those water schemes that comply with 95% criteria on drinking water quality management. Green drop status is awarded to those WWTWs that comply with 90% criteria on key selected indicators on wastewater quality management.
- DWS's Scorecard for assessing the potential for WC/WDM efforts in the Municipality.
- Information to be included in a WSDP Performance- and Water Services Audit as stipulated in regulations under section 9 of the Water Services Act, "Guidelines for Compulsory National Standards" and also required by DWS's 2014 WSDP Performance- and Water Services Audit Report guidelines.
- Information on the implementation of the various WSDP activities, as included under the WSDP Business Elements in DWS's WSDP guidelines.

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

The following water and sanitation related investigations were successfully completed during the last financial year.

- The Water Services Audit Report for 2021/2022 was finalised and approved by Council as part of the Annual Report. The NRW water balance models were updated for each of the distribution systems (Up to the end of June 2022) as part of the Water Services Audit Process.
- Overstrand Municipality continues with the implementation of their Drinking Water Quality and Effluent Quality Sampling Programmes (Both Operational and Compliance Monitoring). Sample results are loaded monthly onto DWS's IRIS. All the WTWs and WWTWs are registered on the IRIS website. The quality of the treated effluent re-used for irrigation purposes from the Hermanus- and Gansbaai WWTW is also sampled monthly.
- Overstrand Municipality is continuing with their Groundwater Monitoring and Management Programmes.
- The Asset Register was updated to include all the water and sewerage capital projects completed during the 2022/2023 financial year.
- The following Technical investigations were completed during the 2022/2023 financial year:
  - Water Source Development and Management Plan for the Overstrand Local Municipality. Baardskeerdersbos Wellfield Annual Monitoring Report, Umvoto, October 2021 to September 2022.
  - Gansbaai Groundwater Monitoring at the WWTW and Communal Sports Centre. Gansbaai Annual Groundwater Monitoring Report, Umvoto, October 2021 to September 2022.
  - Water Resource Development and Management Plan for the Hermanus Area. Gateway, Camphill and Volmoed Wellfields Annual Monitoring Report, Umvoto, October 2021 to September 2022.
  - Water Resource Development and Management Plan for the Stanford Area. Kouevlakte Wellfield Annual Monitoring Report, Umvoto, October 2021 to September 2022.
  - Overstrand Water and Wastewater Treatment Plants. Various Site Investigation Report, Zutari, November 2022.
  - Basic Assessment Report for the Hemel and Aarde Wellfield Augmentation, Umvoto, April 2023.
  - Technical Report: Upgrading of the Kleinmond WWTW, Zutari, June 2023.
  - Report on the technical and environmental assessment of the Onrus Main Sewerage Pumpstation, Lyners, June 2023.

The Municipality also received the following awards / acknowledgements:

- **Overstrand Municipality's performed well with regard to DWS's 2021 Blue Drop Progress Assessment (Drinking Water Process and Quality). The Blue Drop Risk Ratings for all eight systems were in the low-risk category (<50%).**
- **Overstrand Municipality is performing above average with regard to wastewater quality management, with an overall Green Drop Score of 89% for DWS's 2021 assessment.** The Green Drop Scores for all six WWTWs were between 88% and 96% (Six potential Green Drop Certified Systems). The Wastewater Risk Ratings were at low risk (<50%) for the Gansbaai-, Hermanus- and Kleinmond WWTW and at medium risk for the Pearly Beach-, Stanford- and Hawston WWTW (50% - <70%).

Overstrand Municipality was also acknowledged by the DWS as one of the Top 3 Best Performing Municipalities for their Green Drop Results.

- **Overstrand Municipality won the "2022 Municipal Green Economy Change Champions" Showcase**, for championing sustainability and innovation in municipal service provision through outsourcing the operation and maintenance of bulk water and wastewater facilities.

Overstrand Municipality completed or continued with the following key water and sewerage capital infrastructure projects during the 2022/2023 financial year.

- Various sections of the water reticulation networks and sewer drainage networks and pump stations were upgraded as recommended in the Water and Sewer Master Plans. Sections of the old water reticulation networks were also replaced (Implementation of the Pipeline Replacement Programme).
- The Municipality continued with the Hermanus Wellfield Phase 2 upgrade project, including the basic assessment process for the upgrade of the wellfields in the Hemel-en-Aarde valley.
- The Municipality continued with the provision of communal water and sanitation services for the informal areas.
- The RO tank at the De Kelders WTW was replaced and the filters at the Franskraal WTW were refurbished.
- The MCC Panel of the Kraaibosch Dam raw water pump stations was refurbished.
- The Municipality completed the upgrade of the access roads to the Kleinmond and Buffels River WTWs.
- New fencing was installed at some of the water and sewerage infrastructure facilities to improve security.
- The Gansbaai sewer network was extended.
- A new Archimedes Screw pumpstation was completed at the Hermanus WWTW inlet works.
- The Municipality started with the refurbishment and upgrade of the Kleinmond WWTW.
- The rerouting of the treated effluent irrigation pipeline from the Hermanus WWTW was completed.

Quantity of Water Services Provided (Water Balance)

Detail IWA water balance models are in place for each of the water distribution systems (towns) in Overstrand Municipality's Management Area. These models include the volume of raw water abstracted from the various resources, the treated volume supplied from the WTWs (System Input Volumes) and the Treatment Losses, NRW and Water Losses for each of the distribution systems. The flows at each of the WWTWs are also metered and recorded by the Municipality.

Water Services Delivery Profile

The number of consumer units per category or user type is available for each of the distribution systems. The 2022/2023 number of formal water consumers in Overstrand Municipality was 42 472. The average annual growth in the number of water consumers over the period 2014/2015 to 2022/2023 was 2.59%. All the formal households in the urban areas of Overstrand Municipality's Management Area are provided with water and sewer connections inside the erven.

Informal areas are supplied with communal shared services as an intermediary measure. The number of households in informal areas for June 2023 was 11 160. The average ratio of the number of households per communal tap was 4.9 and the ratio of the number of households per communal toilet facility was 2.9.

Overstrand Municipality is committed to ensure that private landowners provide at least basic water and sanitation services to those households in the rural areas with existing services below RDP standard. All schools and medical facilities in Overstrand Municipality's Management Area are supplied with adequate water and sanitation services.

Cost Recovery and Free Basic Services

A detailed step block tariff system is implemented by Overstrand Municipality. This tariff system discourages the wasteful or inefficient use of water. It is expected that this tariff structure will continue to be implemented in the future. The sustainable supply of potable water is however becoming an ever-increasing challenge.

The first six (6) kl of water are provided free to all indigent registered consumers. The number of indigent registered households for June 2023 was 1 491. Overstrand Municipality's tariffs support the viability and sustainability of water supply services to the poor through cross-subsidies where feasible. Free basic water and sanitation services are linked to the Municipality's Indigent Policy and all indigent registered households therefore receive free basic water and sanitation services. This implies that either the equitable share is used to cover this cost, or higher consumption blocks are charged at a rate greater than the cost in order to generate a surplus to cross-subsidise indigent consumers who use up to six (6) kilolitres per month.

The actual operational and maintenance expenditure and income for the last five financial years for water and sanitation services is summarised in the table below (Unaudited figures).

Operational and Maintenance Expenditure and Income for Water and Sanitation Services						
Service	**Expenditure / Income**	**22/23**	**21/22**	**20/21**	**19/20**	**18/19**
Water	Expenditure	R153 152 405	R145 142 796	R137 409 799	R128 656 376	R117 615 148
	Income	R173 298 233	R156 425 649	R153 115 215	R153 663 169	R145 980 226
	Surplus / Deficit	**R20 145 828**	**R11 282 853**	**R15 705 416**	**R25 006 793**	**R28 365 078**
Sanitation	Expenditure	R140 730 503	R112 745 218	R99 329 089	R94 725 991	R86 438 364
	Income	R117 561 435	R123 712 658	R109 567 538	R98 447 712	R104 583 319
	Surplus / Deficit	**R23 169 068**	**R10 967 440**	**R10 238 449**	**R3 721 721**	**R18 144 955**

Water Quality

Comprehensive Operational and Compliance Water Quality and Final Effluent Monitoring Programmes are implemented by Overstrand Municipality. **The water quality of all the water distribution systems in Overstrand Municipality was "Excellent", except for the "Operational Efficiency" indicator for the Buffels River system and the "Aesthetic" indicator for the Buffeljags Bay system that were categorised as "Unacceptable" (According to the SANS 241:2015 classification).**

The percentage compliance of the water quality samples taken over the period July to June for the last three financial years for the various distribution systems, with regard to the four SANS:241:2015 categories, are summarised in the table below.

Percentage Compliance of the Water Quality Samples Taken Over the Period July to June for the Last Three Financial Years															
Distribution System	**Acute Health (%)**						**Chronic Health (%)**			**Aesthetic (%)**			**Operational Efficiency (%)**		
	Microbiological			**Chemical**											
	22/23	**21/22**	**20/21**	**22/23**	**21/22**	**20/21**	**22/23**	**21/22**	**20/21**	**22/23**	**21/22**	**20/21**	**22/23**	**21/22**	**20/21**
Buffels River	99.3	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.8	98.5	89.7	93.9	92.7
Kleinmond	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.2	98.9	99.1
Greater Hermanus	100.0	98.8	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.5	99.6	99.6	98.4	99.1	98.5
Stanford	99.1	98.8	100.0	100.0	100.0	100.0	99.4	100.0	100.0	100.0	99.5	100.0	97.0	97.2	100.0
Greater Gansbaai	99.3	98.7	99.6	100.0	100.0	100.0	99.8	99.7	100.0	100.0	99.8	99.8	97.1	98.4	97.9
Pearly Beach	99.1	98.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.5	99.2	94.9	98.8	97.3
Baardskeerdersbos	99.1	98.7	100.0	100.0	100.0	100.0	97.3	99.2	100.0	94.9	99.1	100.0	93.3	90.8	98.1
Buffeljags Bay	97.6	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	87.0	95.3	97.4	97.8	94.1	96.2
All Systems	**99.4**	**99.1**	**99.9**	**100.0**	**100.0**	**100.0**	**99.6**	**99.9**	**100.0**	**98.6**	**99.3**	**99.4**	**96.0**	**97.2**	**97.4**

Note: *Unacceptable* (According to SANS241-2:2015, Table 4)

The operational water sampling programmes of Overstrand Municipality complies with the minimum monitoring requirements of the SANS 241-2:2015 (Table 1: Minimum monitoring for prescribed process risk indicators) for the various WTWs and distribution systems.

The table below indicates the compliance of the E.Coli monitoring frequency in the water distribution systems of Overstrand Municipality, in terms of the minimum requirements of SANS:241-2: 2015 (Table 2). The period assessed was for samples taken from July 2022 to June 2023.

Overstrand Municipality's Compliance of the Monthly E.Coli Monitoring Frequency in the Water Distribution Systems in Terms of the Minimum Requirements of SANS 241-2:2015 (Table 2)			
Distribution System	**Population served**	**Required number of monthly samples (SANS 241-2:2015: Table 2)**	**Number of monthly E.Coli samples taken by Municipality during 2022/2023**
Buffels River	3 593	2.0	12.4
Kleinmond	8 698	2.0	8.5
Greater Hermanus	76 410	14.6	24.6
Stanford	6 375	2.0	8.4
Greater Gansbaai	22 531	4.3	23.3
Pearly Beach	1 317	2.0	8.6
Baardskeerdersbos	129	2.0	9.0
Buffeljags Bay	155	2.0	6.6

It can be noted from the above table that the number of monthly E.Coli samples taken by the Municipality during the 2022/2023 financial year was far more than the required number of samples for all the water distribution systems.

The overall Microbiological, Chemical and Physical compliance percentages of the final effluent samples taken over the last three financial years at the Kleinmond-, Hawston-, Hermanus-, Stanford-, Gansbaai- and Pearly Beach WWTW are summarised in the table below.

Overall Percentage Compliance of the Final Effluent Samples Taken Over the Last Three Financial Years									
WWTW	**Microbiological (%)**			**Chemical (%)**			**Physical (%)**		
	22/23	**21/22**	**20/21**	**22/23**	**21/22**	**20/21**	**22/23**	**21/22**	**20/21**
Kleinmond	91.7%	91.7	100.0	**54.2%**	62.5	68.8	**83.3%**	91.7	91.7
Hawston	100.0%	91.7	100.0	**54.2%**	58.3	89.6	**72.2%**	66.7	72.2
Hermanus	91.7%	75.0	100.0	**89.6%**	95.8	100.0	**100.0%**	100.0	100.0
Stanford	33.3%	91.7	100.0	**97.9%**	100.0	95.8	**94.4%**	97.2	88.9
Gansbaai	16.7%	50.0	100.0	**66.7%**	81.3	97.9	**88.9%**	100.0	94.4
Pearly Beach	83.3%	100.0	100.0	**72.9%**	72.9	60.4	**25.0%**	50.0	33.3
All WWTWs	**69.4%**	**83.3**	**100.0**	**72.6%**	**78.5**	**85.4**	**77.3%**	**84.3**	**80.1**

Note: Where parameters were resampled, due to failures, the resampled results were used to calculate the above compliance percentages.

Power outages through load shedding have been at the worst level ever during the 2022/23 financial year and had the following negative impacts on the treatment processes at the WWTWs and the compliance of the final effluent:

- Pumps and telemetry devices cannot always be operated during load shedding periods;
- Treatment stops and sewage flows cannot be controlled, which also negatively impact the compliance of the final effluent discharged from the WWTWs; and
- Equipment damage costs, back-up generators costs, increased labour costs and increased pump start-up costs.

Water Conservation and Water Demand Management

The implementation of the Municipality's WDM Strategy and Action Plan have been extremely successful, with the overall raw water requirements for all the systems reduced from 9 206 Ml in 2008/2009 to 7 028 Ml in 2011/2012 (annual decrease of -8.6% over three-year period) and a further steady increase over the last eleven years to 8 160 Ml in 2022/2023 (average annual increase of 1.37% over last eleven years). The overall NRW for all the systems for the 2022/2023 financial year was 1 841 Ml (24.48%). The overall water losses were 1 733 Ml (23.04%).

Treatment Losses, NRW, Water Losses and ILIs for the Various Water Distribution Systems								
Water Distribution System	Component	Unit	22/23	Record: Prior (Ml/a)				
				21/22	20/21	19/20	18/19	17/18
Buffels River	Treatment Losses	Volume	26.640	51.005	14.959	79.606	60.724	64.571
		Percentage	3.97%	6.47%	1.94%	10.37%	7.58%	9.94%
	NRW	Volume	232.091	358.678	383.457	335.271	407.056	265.104
		Percentage	35.99%	48.65%	50.60%	48.70%	54.98%	45.31%
	Water Losses	Volume	169.546	295.471	330.845	302.971	345.276	263.934
		Percentage	26.29%	40.08%	43.66%	44.01%	46.63%	45.11%
	ILI		**1.73**	**3.04**	**3.44**	**3.00**	**3.45**	**2.67**
	The current treatment losses of below 10% are at an acceptable level. The NRW and Water Losses were reduced by approximately 13% over the last financial year, which is excellent. The NRW percentage is however still above the DWS's target of 30% and the Municipality needs to continue with the implementation of specific WC/WDM measures to further reduce the NRW and water losses. The Municipality needs to work towards targets of 30% for the NRW and 20% for the water losses. The ILI value indicates an excellent system, with no immediate intervention required and the Municipality needs to keep the ILI level below 2.							
Kleinmond	Treatment Losses	Volume	86.275	61.360	75.267	73.584	67.349	16.091
		Percentage	9.40%	7.04%	8.55%	8.19%	8.64%	2.25%
	NRW	Volume	287.316	281.074	289.372	276.922	183.409	188.379
		Percentage	34.54%	34.69%	35.94%	33.57%	25.75%	26.90%
	Water Losses	Volume	283.332	269.958	282.963	273.090	178.280	186.978
		Percentage	34.06%	33.32%	35.15%	33.11%	25.03%	26.70%
	ILI		**3.09**	**2.96**	**3.11**	**3.30**	**2.17**	**2.28**
	The current treatment losses of below 10% are at an acceptable level. The NRW and water losses stayed roughly the same for the last two financial years. The NRW percentage is above the DWS's target of 30% and the Municipality needs to continue with the implementation of specific WC/WDM measures to reduce the NRW and water losses. The Municipality needs to work towards targets of 30% for the NRW and 25% for the water losses. The current ILI value of 3.09 is good and no urgent action is required, but the NRW and Water Losses should however be monitored carefully.							
Greater Hermanus	Treatment Losses	Volume	113.774	194.527	217.909	445.591	487.283	539.107
		Percentage	2.67%	4.56%	5.14%	10.79%	11.77%	12.89%
	NRW	Volume	816.989	753.296	960.986	430.532	332.685	262.270
		Percentage	19.67%	18.50%	23.88%	11.69%	9.10%	7.20%
	Water Losses	Volume	782.891	702.134	947.239	416.581	316.318	254.983
		Percentage	18.85%	17.25%	23.54%	11.31%	8.66%	7.0%
	ILI		**1.77**	**1.62**	**2.23**	**0.98**	**0.75**	**0.62**
	The current treatment losses of below 10% are at an acceptable level. The current NRW and water losses percentages are at good levels and the Municipality needs to maintain the percentages for the NRW and water losses below 20%. The ILI value indicates an excellent system, with no immediate intervention required and the Municipality needs to keep the ILI level below 2.							
Stanford	Treatment Losses	Volume	235.534	197.305	143.545	40.381	53.133	20.993
		Percentage	47.26%	42.08%	32.15%	11.05%	14.18%	6.53%
	NRW	Volume	13.485	17.035	79.613	93.141	90.868	78.723
		Percentage	5.13%	6.27%	26.28%	28.65%	28.25%	26.20%
	Water Losses	Volume	11.884	13.758	78.036	91.463	87.478	78.122
		Percentage	4.52%	5.07%	25.76%	28.14%	27.19%	26.00%
	ILI		**0.33**	**0.39**	**2.27**	**4.31**	**4.16**	**3.81**
	The treatment losses of the RO plant are closely monitored by the Municipality to ensure that it is at acceptable levels. There was a drastic decrease in the NRW and water losses for the last two financial years for Stanford. The Municipality recently installed a new bulk water meter in order to ensure that readings for the calculation of the NRW and Water are accurate. The Municipality needs to keep the NRW below a target of 20% and the water losses below a target of 15%. The ILI value is extremely low and it will be verified during the new financial year, when the readings from the newly installed bulk water meter become available.							
Greater Gansbaai	Treatment Losses (Franskraal)	Volume	83.200	120.239	97.490	64.025	66.610	55.750
		Percentage	6.55%	10.64%	8.69%	5.45%	5.56%	5.02%
	Treatment Losses (De Kelders)	Volume	83.545	69.131	79.262	69.012	71.221	68.287
		Percentage	23.11%	19.71%	22.89%	19.68%	19.71%	16.30%
	NRW	Volume	455.188	308.847	308.492	390.657	450.328	449.900
		Percentage	31.08%	23.92%	23.89%	28.07%	31.67%	32.01%
	Water Losses	Volume	450.605	294.694	303.451	384.859	445.817	447.089
		Percentage	30.77%	22.82%	23.50%	27.66%	31.35%	31.81%
	ILI		**3.16**	**2.13**	**2.26**	**3.03**	**3.58**	**3.84**
	The treatment losses of the De Kelders RO plant are closely monitored by the Municipality to ensure that it is at							

Treatment Losses, NRW, Water Losses and ILIs for the Various Water Distribution Systems								
Water Distribution System	**Component**	**Unit**	**22/23**	**Record: Prior (Ml/a)**				
				21/22	**20/21**	**19/20**	**18/19**	**17/18**
	acceptable levels. The current treatment losses of below 10% for the Franskraal plant are at an acceptable level. The NRW percentage is just above the DWS's target of 30% and the Municipality needs to continue with the implementation of specific WC/WDM measures to reduce the NRW and water losses. The Municipality needs to work towards targets of 30% for the NRW and 25% for the water losses. The current ILI value of 3.16 is good and no urgent action is required, but the NRW and Water Losses should however be monitored carefully.							
Pearly Beach	Treatment Losses	Volume	7.263	-6.419	4.756	4.891	29.603	5.860
		Percentage	4.89%	-4.35%	3.10%	3.15%	16.98%	4.64%
	NRW	Volume	25.787	41.065	44.318	46.005	38.499	23.495
		Percentage	18.25%	26.65%	29.81%	30.57%	26.60%	19.52%
	Water Losses	Volume	25.284	39.415	43.574	45.166	37.760	23.254
		Percentage	17.89%	25.58%	29.31%	30.02%	26.09%	19.32%
	ILI		**0.70**	**1.12**	**1.26**	**2.81**	**2.35**	**1.43**
	The current treatment losses of below 10% are at an acceptable level. The current NRW and water losses percentages are at good levels and the Municipality needs to maintain the percentages for the NRW and water losses below 20%. The ILI value indicates an excellent system, with no immediate intervention required and the Municipality needs to keep the ILI level below 2.							
Baardskeerdersbos	Treatment Losses	Volume	2.229	3.202	2.603	2.637	3.101	2.446
		Percentage	11.56%	19.02%	14.67%	14.40%	17.15%	14.26%
	NRW	Volume	8.125	5.883	7.918	6.941	7.509	6.752
		Percentage	47.67%	43.14%	52.31%	44.28%	50.14%	45.91%
	Water Losses	Volume	7.640	5.738	7.871	6.834	7.313	6.723
		Percentage	44.82%	42.08%	52.00%	43.60%	48.83%	45.71%
	ILI		**2.26**	**1.71**	**2.35**	**2.12**	**2.29**	**2.12**
	The Municipality needs to work towards a target of below 10% for the treatment losses. The current NRW and water losses are extremely high. The NRW percentage is above the DWS's target of 30% and the Municipality needs to continue with the implementation of specific WC/WDM measures to reduce the NRW and water losses. The Municipality needs to work towards targets of 35% for the NRW and 30% for the water losses. The current ILI value of 2.26 is good and no urgent action is required, but the NRW and Water Losses should however be monitored carefully.							
Buffeljags Bay	Bulk Distribution Losses	Volume	0.182	0.247	-0.220	-0.139	0.048	0.523
		Percentage	3.10%	4.49%	-3.89%	-2.77%	0.98%	10.53%
	NRW	Volume	1.998	2.299	3.156	0.930	0.770	0.373
		Percentage	35.11%	43.73%	53.68%	18.03%	15.83%	8.40%
	Water Losses	Volume	1.986	2.243	3.127	0.901	0.741	0.364
		Percentage	34.90%	42.67%	53.19%	17.46%	15.24%	8.20%
	ILI		**21.47**	**24.25**	**33.80**	**4.95**	**4.05**	**2.0**
	The bulk distribution losses of below 5% are at an acceptable level. The NRW and Water Losses were reduced by approximately 8% over the last financial year, which are excellent. The NRW percentage is however still above the DWS's target of 30% and the Municipality needs to continue with the implementation of specific WC/WDM measures to reduce the NRW and water losses. The Municipality needs to work towards targets of 30% for the NRW and 25% for the water losses. The current ILI value of 21.5 is extremely high, which requires immediate water loss reduction interventions.							
TOTAL	**NRW**	**Volume**	**1 840.979**	**1 768.177**	**2 077.312**	**1 580.399**	**1 511.124**	**1 274.996**
		Percentage	**24.48%**	**24.04%**	**28.26%**	**22.31%**	**21.54%**	**18.82%**
	Water Losses	**Volume**	**1 733.168**	**1 623.411**	**1 997.106**	**1 521.865**	**1 418.983**	**1 261.447**
		Percentage	**23.04%**	**22.07%**	**27.17%**	**21.48%**	**21.23%**	**18.62%**
	ILI		**1.94**	**1.85**	**2.32**	**1.83**	**1.73**	**1.57**
	The NRW and water losses for all the systems combined increased slightly during the last financial year, but are still below DWS's target of 30% for the NRW, which is good. The Municipality needs to work towards targets of 20% for the NRW and 15% for the water losses. The current ILI of 1.94 is excellent, with no immediate intervention required and the Municipality needs to keep the ILI level below 2.							

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

Category A = No specific intervention required.

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

Category C = Requires attention

Category D = Requires immediate water loss reduction interventions

The Billed Metered Consumption figures up to 2019/2020 included the raw water volumes supplied from the different raw water pipelines to consumers, as well as the volume of treated effluent re-used by consumers. These volumes were excluded for the 2020/2021 financial year onwards and therefore the drastic increase in the NRW and Water Losses for the 2020/2021 financial year, especially in the Greater Hermanus area.

Water Services Asset Management

A comprehensive Asset Register is in place for Overstrand Municipality, which include all the water and sewerage infrastructure. The CRC, CV, RUL, Age distribution and Condition of the water and sewerage infrastructure in Overstrand Municipality's Management Area is summarised in the table below (June 2023).

CRC, CV, RUL, Age Distribution and Condition of the Water and Sewerage Infrastructure					
Asset Type			**CRC**	**CV**	**% CV / CRC**
Water Infrastructure			R1 210 354 933	R497 999 097	41.1%
Sewerage Infrastructure			R621 607 942	R455 302 649	73.2%
Remaining Useful Life (CRC)					
Asset Type	**0 – 5 yrs**	**6 – 10 yrs**	**11 – 15 yrs**	**16 – 20 yrs**	**> 20 yrs**
Water Infrastructure	R602 699 577	R51 664 360	R2 250 358	R164 608 960	R389 131 678
Sewerage Infrastructure	R72 043 609	R102 305 589	R15 047 540	R81 178 906	R351 032 298
Age Distribution (CRC)					
Asset Type	**0 – 5 yrs**	**6 – 10 yrs**	**11 – 15 yrs**	**16 – 20 yrs**	**> 20 yrs**
Water Infrastructure	R1 217 836	R111 592 429	R234 028 591	R174 671 922	R688 844 155
Sewerage Infrastructure	R127 215	R99 384 641	R70 879 466	R44 557 603	R406 659 017
Condition grading by Facility Type (CRC)					
Asset Type	**Very Poor**	**Poor**	**Fair**	**Good**	**Very Good**
Water Infrastructure	R380 492 931	R40 901 975	R427 186 708	R159 926 896	R201 846 423
Sewerage Infrastructure	R18 124 662	R64 005 399	R281 297 322	R188 353 713	R69 826 846

The CRC and CV in the above table indicate that 58.9% of the value of the water infrastructure and 26.8% of the value of the sewerage infrastructure has been consumed.

The CRC of the water and sewerage infrastructure that will need to be replaced over the next five years (RUL <5 yrs) is R674.743 million. The asset renewal needs for the water infrastructure assets over the next ten years is R65.436 million per year. The reinvestment required is R602.700 million in the first five years and R51.664 million in the second five-year period. The age of 56.9% of the water infrastructure assets is greater than twenty years. The CRC of the water infrastructure with a condition grading of "Very Poor" is R380.493 million. The asset renewal needs for the sewerage infrastructure assets over the next ten years is R17.435 million per year. The reinvestment required is R72.044 million in the first five years and R102.306 million in the second five-year period.

The age of 65.4% of the sewerage infrastructure assets is greater than twenty years. The CRC of the sewerage infrastructure with a condition grading of "Very Poor" is R18.125 million.

Some of the key challenges of Overstrand Municipality are to identify adequate funds for the rehabilitation and maintenance of their existing infrastructure, which is critical to ensure the sustainability of the services that are provided by the Municipality. The Water and Wastewater Bulk Works Contract ensures that the new technology installed is adequately maintained and operated in order to prevent a massive increase in maintenance in the future due to backlog being created (Objective is asset preservation). This Bulk Works Contract addresses the capacity constraints, the Municipality previously experienced, with regard to the operation and maintenance of the WTWs and WWTWs (Objectives are skills development and retention and long-term improvement of efficiency of operations).

It is important for the Municipality to secure adequate funding for major refurbishment and maintenance work, the provision of bulk infrastructure and development of additional sources to keep up with the high demand for services.

Water Services Operation and Maintenance

The existing Water and Wastewater Bulk Works Contract assists Overstrand Municipality with the operation and maintenance of their bulk water and sewerage infrastructure. Design-out Maintenance, Preventative Maintenance and Corrective or Breakdown Maintenance are practised by Overstrand Municipality (Planned and unplanned preventative and corrective maintenance). Adequate resources, information and activity control and management are in place to ensure proper operation and maintenance of the water and sewerage infrastructure.

A pipe replacement study was performed for Overstrand Municipality's entire water distribution system in October 2019. The replacement value for the top 200 pipes to be replaced in Overstrand Municipality is R19.849 million (20.697km).

Water Resources

The Western Cape experienced a severe drought over the period 2015 to 2017, with some relief during the 2018 to 2022 winter months. The drought over the period 2015 to 2017 reduced the safe yield of the Municipality's own existing surface and groundwater resources. The Municipality therefore continued with the implementation of various WC/WDM measures to lower the current and future water requirements and investigations of augmentation options for the existing water resources.

The table below gives an overview of the years in which the annual water requirements are likely to exceed the sustainable yields / license volumes from the various resources.

Years in which the Annual Water Requirement will Exceed the Sustainable Yields / License Volumes from the Various Resources

Distribution System	Total Sustainable Yield (Y) / License Volume (L) (x 10^6 m^3/a)	Annual Growth on 2022/2023 requirement (2.5% or 3.0%)	Annual Growth on 2022/2023 requirement (3.5% or 4.0%)	WSDP Projection Model
Buffels River	1.717 (Y)	> 2047 (2.5%)	> 2047 (3.5%)	> 2047
Kleinmond	2.589 (Y)	> 2047 (2.5%)	> 2047 (3.5%)	> 2047
Greater Hermanus	6.000 (L) *	2033 (3.0%)	2030 (4.0%)	2031
Stanford	1.600 (L)	> 2047 (2.5%)	> 2047 (3.5%)	> 2047
Greater Gansbaai	2.768 (Y)	2039 (3.0%)	2035 (4.0%)	2039
Pearly Beach	0.307 (Y)	> 2047 (2.5%)	2043 (3.5%)	2039
Baardskeerdersbos	0.090 (Y)	> 2047 (2.5%)	> 2047 (3.5%)	> 2047
Buffeljags Bay	0.028 (Y)	> 2047 (2.5%)	> 2047 (3.5%)	> 2047

Note * With Gateway, Camphill and Volmoed Well Fields fully operational according to the licensed volumes.

The augmentation of the Greater Hermanus existing water sources is currently the most critical. The Municipality is currently busy with the EIA process for the augmentation of the Hemel & Aarde (Camphill and Volmoed well fields) boreholes. A Scoping Report "Augmentation of potable water supplies to Hermanus" was also completed during August 2018. The following augmentation schemes were considered:

- Seawater reverse osmosis;
- Desalination-based direct reuse scheme;
- Non-desalination based direct reuse scheme;
- Remix scheme;
- Palmiet river abstraction; and
- Aquifer recharge.

The following additional work was completed during October 2019, after the completion of the above-mentioned Scoping Report.

- Sea water quality tests;
- Renewable energy options;
- Electricity cost sensitivity analysis;
- Contracting modes;
- Recommended water price plan; and
- Suitability of earmarked SWRO site.

Water Services Institutional Arrangements and Customer Services

Overstrand Municipality is the official WSA for the entire Municipal Management Area and also acts as the WSP for the whole area. Current water services are delivered by way of an internally operated and managed mechanism. The Municipal personnel is continuously exposed to training opportunities, skills development and capacity building at a technical, operations and management level in an effort to create a more efficient overall service to the users. A Workplace Skills Plan is compiled every year and the specific training needs of the personnel, with regard to water and wastewater management are determined annually.

The approved organogram for the municipality had 1 092 filled and 108 vacant posts at the end of June 2023, resulting in a vacancy rate of 9.9% for the 2022/2023 financial year.

Overstrand Municipality's Vulnerability Index for 2023 was indicated as 0.23 "Low Vulnerability" in the Municipal Strategic Self-Assessment. The only area of concern evident from the 2023 assessment is Financial Asset Management (High Vulnerability, 50.0%).

A Water and Wastewater Bulk Works Contract commenced on the 8th of December 2018 between Overstrand Municipality and Veolia Water Solutions & Technologies South Africa (Pty) Ltd to operate and maintain the bulk infrastructure in Overstrand Municipality's Management Area for a period of fifteen (15) years. The Municipality also has the right to extend the contract for a further five (5) years. The operation and maintenance of the following bulk infrastructure forms part of the Contract.

- Hawston, Hermanus, Stanford, Gansbaai, Kleinmond and Eluxolweni WWTW;
- Preekstoel (Hermanus), Buffels River, Franskraal, Pearly Beach, De Kelders, Stanford, Kleinmond, Baardskeerdersbos and Buffeljags Bay WTW;
- Resources;
- Surface water pump stations and borehole pumps;
- Bulk water and sewer pipelines;
- Reservoirs; and
- Water and sewer pump stations and rising main pipelines.

In line with Overstrand Municipality's Vision – **to be a centre of excellence to the community** – the Municipality has developed a comprehensive customer care strategy. The strategy has now rolled out into consumer services charters for the following departments: electricity, water and sanitation, solid waste management and roads and storm water.

A comprehensive Customer Services and Complaints system is in place at Overstrand Municipality. The Municipality has maintained a high and a very consistent level of service to its urban water consumers. Helpdesks were developed at all the municipal administrations with the objective to assist customers. Disabled people are supported to do business from the helpdesks. Requests by the illiterate are being captured and forwarded to the relevant official / section. All municipal buildings are accessible and wheel-chair friendly.

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

The Water Safety Plans of Overstrand Municipality includes an Improvement / Upgrade Plan. The purpose of the Improvement / Upgrade Plan is to address the existing significant risks where the existing controls were not effective or absent. Barriers implemented by Overstrand Municipality against contamination and deteriorating water quality include the following:

- Participate in Catchment management and water source protection initiatives.
- Protection at points of abstraction such as river intakes and dams (Abstraction Management).
- Correct operation and maintenance of WTWs (Coagulation, flocculation, sedimentation and filtration).
- Protection and maintenance of the distribution system. This includes ensuring an adequate disinfectant residual at all times, rapid response to pipe bursts and other leaks, regular cleaning of reservoirs, keeping all delivery points tidy and clean, etc.

Three other important barriers implemented by Overstrand Municipality against poor quality drinking water that are a prerequisite to those listed above are as follows:

- A well-informed Council and top management that understands the extreme importance of and are committed to providing adequate resources for continuous professional operation and maintenance of the water supply system.
- Competent managers and supervisors in the technical department who are responsible for water supply services and lead by example and are passionate about monitoring and safeguarding drinking water quality.
- Well informed community members and other consumers of water supply services that have respect for water as a precious resource.

OVERSTRAND MUNICIPALITY

ANNUAL WSDP PERFORMANCE AND WATER SERVICES AUDIT REPORT FOR 2022/2023

BACKGROUND

Appointment

iX Engineers was appointed by Overstrand Municipality to assist them with the compilation of their WSDP Performance- and Water Services Audit Report, which forms part of their annual report for the 2022/2023 financial year. The purpose of the WSDP Performance- and Water Services Audit Report is to report on the implementation of Overstrand Municipality's previous year's WSDP, for the 2022/2023 financial year.

The DWS developed the "Annual Water Services Development Plan Performance- and Water Services Audit Report" template during 2014, to assist Municipalities with the drafting of their reports. iX Engineers agreed with Overstrand Municipality to follow this template as far as possible.

Purpose

Overstrand Municipality is required in terms of Section 18 of the Water Services Act, 1997 (Act No.108 of 1997), as well as the "Regulations relating to compulsory national standards and measures to conserve water", as issued in terms of sections 9(1) and 73(1)(j) of the Water Services Act, to report on the implementation of its WSDP during each financial year and to include a water services audit in such an annual report.

Section 62 of the Water Services Act further requires the Minister to monitor every WSI in order to ensure compliance with the prescribed national standards. This regulation requires a WSA to complete and submit a WSDP Performance- and Water Services Audit every financial year. The WSDP Performance- and Water Services Audit is designed to monitor the compliance of the WSA and other WSIs with these regulations. The Water Services Act allows the audit to be used as a tool to compare actual performance of the WSA against the targets and indicators set in their WSDP. The purpose of the WSDP Performance- and Water Services Audit is as follows:

- To monitor compliance with the Act and these regulations.
- To compare actual performance against targets contained in the WSDPs.
- To identify possibilities for improving water conservation and water demand management.

The WSDP Performance- and Water Services Audit Report will give an overview of the implementation of the Municipality's previous year's WSDP, for the 2022/2023 financial year, and can be seen as an annexure to Overstrand Municipality's Annual Report. The Annual Report is compiled as required by the Local Government: Municipal Systems Act, Act no 32 of 2000 (Section 46) and the Local Government: Municipal Finance Management Act, Act no 56 of 2003 (Section 121). The WSDP Performance- and Water Services Audit Report contain the following detail information:

- The Municipality's performance with regard to their KPIs for water and sewerage services for the 2022/2023 financial year, as included in the Municipality's SDBIP.
- The Municipality's Performance with regard to DWS's Blue and Green Drop Assessments. Blue drop status is awarded to those water schemes that comply with 95% criteria on drinking water quality management. Green drop status is awarded to those WWTWs that comply with 90% criteria on key selected indicators on wastewater quality management.
- DWS's Scorecard for assessing the potential for WC/WDM efforts in the Municipality.

- Information to be included in a WSDP Performance- and Water Services Audit as stipulated in regulations under section 9 of the Water Services Act, "Guidelines for Compulsory National Standards" and also required by DWS's 2014 WSDP Performance- and Water Services Audit Report guidelines.

- Information on the implementation of the various WSDP activities, as included under the WSDP Business Elements in DWS's WSDP guidelines.

A. WATER SERVICES AUTHORITY PROFILE

A.1. Map of Water Services Authority Area of Jurisdiction

Overstrand Municipality is located in the Overberg District of the Western Cape, as indicated in the figure below.

Figure A.1.1: Location of Overstrand Municipality in the Western Cape

The figure below gives an overview of Overstrand Municipality's Management Area and the settlements located in the Area.

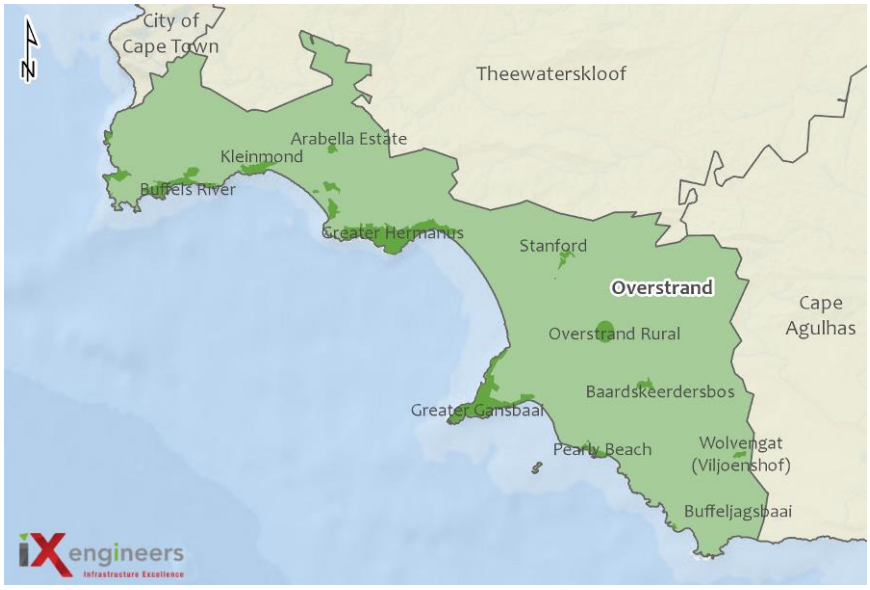


Figure A.1.2: Overstrand Municipality's Management Area

The various schemes supplied with bulk water/sewerage by Overstrand Municipality are discussed in more detail under Section A.3. The existing water and sewerage infrastructure of the various distribution systems are indicated on the Aerial Photos included in the Municipality's detail WSDP documents.

A.2. Water Services Administration and Organization

Overstrand Municipality is the WSA for the entire Municipal Management Area and act as the WSP for the whole area. The Municipality's current water services are delivered by way of an internally operated and managed mechanism.

A Water and Wastewater Bulk Works Contract was signed during the 2018/2019 financial year between Overstrand Municipality and an External Service Provider to operate and maintain the bulk infrastructure in Overstrand Municipality's Management Area for a period of fifteen (15) years starting on the 8th of December 2018. The Municipality also has the right to extend the contract for a further five (5) years. The Municipality will ensure the long-term efficient operation and maintenance of their bulk water and sewerage infrastructure through the Contract. The operation and maintenance of the following bulk infrastructure forms part of the Contract:

- Hawston, Hermanus, Stanford, Gansbaai, Kleinmond and Eluxolweni WWTWs;
- Preekstoel (Hermanus), Buffels River, Franskraal, Pearly Beach, De Kelders, Stanford, Kleinmond, Baardskeerdersbos and Buffeljags Bay WTWs;
- Resources;
- Surface water pump stations and borehole pumps;
- Bulk water and sewer pipelines;
- Reservoirs; and
- Water and sewer pump stations and rising main pipelines.

The Western Cape Provincial Treasury indicated at the time that they have, in principle, no objection against the Municipality's intention to enter into such a contract, subject to the required Supply Chain Management processes being followed, the requirements of the MFMA being adhered to, and the carry through implications over the MTREF be taken into account within the budgets of each of the affected years with the required budgetary provision to ensure affordability and sustainability over new MTREF years.

Overstrand Municipality's latest approved Organogram is included in Annexure F. The table below gives the contact details of the persons responsible for water services management and planning within Overstrand Municipality.

Table A.2.1: Water Services Administrative Structure	
Accounting Officer	
Designation	Municipal Manager
Name	D O'Neill
Telephone Nr.	028 313 8909
Fax Nr.	028 313 8128
Cell Nr.	076 911 6497
Email	mm@overstrand.gov.za
WSA Manager	
Designation	Director: Infrastructure & Planning
Name	S Müller
Telephone Nr.	028 313 8019
Fax Nr.	028 313 8128
Cell Nr.	082 495 1924

Table A.2.1: Water Services Administrative Structure	
Email	smuller@overstrand.gov.za
WSP Manager	
Designation	Acting Director: Community Services
Name	J Solomons
Telephone Nr.	028 384 8312
Fax Nr.	-
Cell Nr.	079 377 8963
Email	jasonsolomons@overstrand.gov.za
WSDP Manager	
Designation	Deputy Director: Engineering Planning
Name	H Blignaut
Telephone Nr.	028 313 5047
Fax Nr.	-
Cell Nr.	082 497 9169
Email	hblignaut@overstrand.gov.za
IDP Manager	
Designation	Senior Manager: Strategic Services
Name	R Louw
Telephone Nr.	028 313 8071
Fax Nr.	028 313 8128
Cell Nr.	083 568 9180
Email	rlouw@overstrand.gov.za

A.3. Water Services Overview

Overstrand Municipality is situated within the Breede-Gouritz Water Management Area (WMA). The Municipality consists of thirteen (13) individual wards and is the only WSA within this municipal area and is also the Water Services Provider for the internal water and sewerage networks and services. The bulk water and sewerage infrastructure are operated and maintained by an external Service Provider, as previously mentioned. Overstrand Municipality's Management Area includes the following towns and ***Water Distribution Systems***:

- Rooi Els, Pringle Bay, Betty's Bay – ***Buffels River System***

  The towns of Rooi Els, Pringle Bay and Betty's Bay obtain their bulk water from the Buffels River Dam. The raw water is treated at the Buffels River WTW before it is distributed to the various consumers in Rooi Els, Pringle Bay and Betty's Bay.

- Kleinmond – ***Kleinmond System***

  Kleinmond is supplied from the Palmiet River and the "Dorpsfontein". A borehole (1998), located 300m to the east of the fountain, is available as additional source in case of emergency. The raw water is treated at the Kleinmond WTW before it is distributed to the various consumers in Kleinmond.

- Fisherhaven, Hawston, Vermont, Onrus, Sandbaai, Hermanus – ***Greater Hermanus System***

  The Greater Hermanus area is supplied with bulk surface water from De Bos Dam and bulk groundwater from the Gateway-, Camphill- and Volmoed Well Fields. The surface and groundwater are treated at the Preekstoel WTW before it is distributed to the various consumers in the Greater Hermanus area. A portion of the final effluent from the Hermanus WWTW is used for irrigation purposes. Raw surface water from the Mossel River and Fisherhaven Dams is also used for irrigation purposes.

- Stanford – ***Stanford System***

  Stanford is supplied with bulk water from the high discharging Stanford Spring, generally known as "Die Oog" (the Eye), which was previously the sole source of supply of potable water to the town and the greater area. Two "Kouevlakte wellfield" boreholes were also drilled during 2010/2011 and a new bulk pipeline was constructed the following year in order to connect the boreholes to the existing network. The raw water is treated at the Stanford WTW (Ultrafiltration plus Reverse Osmosis Plant) before it is distributed to the various consumers in Stanford.

- De Kelders, Gansbaai, Kleinbaai, Franskraal – ***Greater Gansbaai System***

  The water sources of Gansbaai, De Kelders, Kleinbaai and Franskraal are integrated with each other through the bulk water supply distribution system. In the past specific sources were utilised for specific areas, but due to peak supply limitations of underground resources during peak seasons, the system has become completely integrated. Bulk water supply to the Greater Gansbaai system is from the Franskraal and Kraaibosch dams and the Klipgat and Grotte water sources, which consist of a spring in the De Kelders caves and a spring at Stanfords Bay. The raw water from the Franskraal and Kraaibosh dams are treated at the Franskraal WTW and the water from the Klipgat and Grotte water sources are treated at the De Kelders WTW. Final effluent from the Gansbaai WWTW is used for irrigation purposes.

- Pearly Beach – ***Pearly Beach System***

  Pearly Beach is supplied from seven springs located in the mountains some 6km from Pearly Beach. The water from the springs is kept in storage at the Pearly Beach Dam. A Service Level Agreement is also in place for the supply of 0.26 Ml/d from the Koekemoer Dam free of charge to the Municipality. The raw water is treated at the Pearly Beach WTW before it is distributed to the various consumers in Pearly Beach.

- Baardskeerdersbos – ***Baardskeerdersbos System***

  Bulk water supply to Baardskeerdersbos is from two boreholes. Baardskeerdersbos previously received their bulk water from the Boskloof Stream, but all current bulk water supply to the area and in the future will be from the boreholes. The groundwater is treated at the Baardskeerdersbos WTW before it is distributed to the various consumers in Baardskeerdersbos.

- Buffeljags Bay – ***Buffeljags Bay System***

  Bulk water supply to Buffeljags Bay is from a borehole. The water is disinfected before it is distributed to the various consumers in Buffeljags Bay.

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

Table A.3.1: Existing Main Water Infrastructure (Resources and WTWs)

Water Distribution System	Bulk Supply	WTWs and Treatment Processes	
	(Resources)	WTW (Capacity in Ml/d)	Processes
Buffels River	Buffels River Dam	Buffels River (5.500)	Chemical dosing (Aluminium Chlorohydrate), flocculation, sedimentation, filtration (Rapid gravity sand filters), stabilization (Soda Ash) and disinfection (Chlorine Gas)
Kleinmond	Palmiet River, Kleinmond Borehole & Dorpsfontein Spring	Kleinmond (5.800)	Chemical dosing (Aluminium Chlorohydrate and Soda Ash), flocculation, sedimentation, filtration (Rapid gravity sand filters), stabilization (Soda Ash) and disinfection (Chlorine Gas).
Greater Hermanus	De Bos Dam and Gateway, Camphill and Volmoed wellfields	Preekstoel (21.000)	Chemical dosing (Aluminium Sulphate and Sodium Aluminate), flocculation, sedimentation, filtration (Rapid gravity sand filters), stabilization (Lime) and Disinfection (Chlorine Gas)
		Groundwater Hemel & Aarde (10.000)	Biological WTW for iron and manganese removal by contact filtration, Caustic Soda dosing and Aeration (Hemel & Aarde).
		Groundwater Gateway (7.000)	Chemical oxidation treatment plant with Potassium Permanganate and Aeration (Gateway Wellfield).

Table A.3.1: Existing Main Water Infrastructure (Resources and WTWs)			
Water Distribution System	**Bulk Supply**	**WTWs and Treatment Processes**	
	(Resources)	**WTW (Capacity in Ml/d)**	**Processes**
Stanford	Stanford Spring and two Kouevlakte Boreholes	Stanford RO plant (1.000)	Ultrafiltration plus Reverse Osmosis Plant and disinfection (Sodium Hypochlorite)
Greater Gansbaai	Franskraal and Kraaibosch Dams	Franskraal (6.500)	Chemical dosing (Aluminium Chlorohydrate), flocculation, sedimentation, filtration (Rapid gravity sand filters), disinfection (Chlorine Gas) and stabilization (Soda Ash)
	Klipgat Fountain and De Kelders Caves Fountain.	De Kelders (1.600)	Ultrafiltration plus Reverse Osmosis Plant and disinfection (Sodium Hypochlorite)
Pearly Beach	Pearly Beach Springs and Koekemoer Dam	Pearly Beach (1.440)	DAFF pre-treatment, Ultrafiltration Modules from Memcor, Chemical dosing (Sudfloc K300) and disinfection (Sodium Hypochlorite)
Baardskeerders-bos	Two Boreholes	Baardskeerdersbos (0.185)	pH adjustment, oxidation, settling, ultrafiltration and disinfection (Sodium Hypochlorite).
Buffeljags Bay	Borehole	-	Disinfection (Chlorine Tablets)

The existing capacities and current flows at each of the WTWs are summarised in the table below.

Table A.3.2: Existing Capacities and Flows at each of the WTWs (Ml/d)						
WTW	**Existing Hydraulic Capacity**	**Peak Month Average Daily Flow**	**Average Daily Flow (Jul 2022 – Jun 2023)**	**Average Daily Flow as a % of Capacity**	**Required Treatment Capacity (1.5 x AADD10yr)**	**2022/2023 Water Quality Failures (SANS0241:2015)**
Buffels River	5.500	2.371 (Dec)	1.840	33.45%	3.533	Turbidity (Operational)
Kleinmond	5.800	2.930 (Dec)	2.515	43.36%	4.830	-
Preekstoel	38.000	13.861 (Jan)	11.691	30.77%	23.568	-
Stanford	2.710 *	1.638 (Oct)	1.365	50.37%	2.622	Total Coliforms
Franskraal	6.500	4.157 (Jan)	3.479	53.52%	7.013	Total Coliforms
De Kelders	1.600	1.197 (Mar)	0.990	61.88%	1.600	
Pearly Beach	1.440	0.536 (Jan)	0.407	28.26%	0.782	Total Coliforms
Baardskeerdersbos	0.185	0.070 (Nov)	0.053	28.65%	0.101	Manganese and Turbidity (Operational)

Note: * The Stanford RO Plant has a hydraulic design capacity of 1.250 Ml/d. The water from the RO plant is however blended with the raw water and the level of blending is controlled through the monitoring of the hardness of the water. The overall treatment capacity for the Stanford system is therefore 2.710 Ml/d.

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

Table A.3.3: Existing Water Infrastructure (Reticulation, Pump Stations and Reservoirs)						
Water Distribution System	**Water Distribution Networks**		**Number of Water PS**		**Reservoirs and Water Towers**	
	Bulk	**Internal**	**Raw Water**	**Potable Water**	**Number of Reservoirs & Water Towers**	**Total Storage in Ml**
	km	**km**	**Number of PS**	**Number of PS**		
Buffels River	15.326	123.859	-	4	6	6.267
Kleinmond	5.400	75.053	3	1	3	8.100
Greater Hermanus	41.586	328.807	1	6	21	38.446
Stanford	5.564	34.501	-	2	2	2.750
Greater Gansbaai	35.299	140.970	3	3	10	13.050
Pearly Beach	12.404	30.969	-	2	2	2.300
Baardskeerdersbos	0.858	4.952	-	1	1	0.150
Buffeljags Bay	2.575	0.469	-	-	1	0.096
Total Overstrand	**119.012**	**739.580**	**7**	**19**	**46**	**72.544**

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

Table A.3.4: Existing Sewerage Infrastructure

Sewer Drainage Systems	WWTWs and Treatment Processes			Sewer Drainage Network		Number of Sewer PS	
	Hydraulic Capacity	Organic Capacity	Treatment Processes	Rising	Gravity	Mun	Private
	Ml/d	kg COD/d		km	km		
Buffels River	-	-	-	-	-	-	-
Kleinmond	0.997	843	Kleinmond Activated Sludge System	6.841	29.902	6	1
Greater Hermanus	0.700	968	Hawston Activated Sludge System	33.041	257.684	33	2
	12.000	9 000	Hermanus Activated Sludge System				
Stanford	1.200	1 200	Stanford Activated Sludge System	3.242	29.752	4	2
Greater Gansbaai	2.000	3 600	Gansbaai Nereda System	4.282	24.686	4	-
Pearly Beach	0.259	198	Eluxolweni Oxidation Pond System	0.941	5.245	1	1
Baardskeerdersbos	-	-	-	-	-	-	-
Buffeljags Bay	-	-	-	-	-	-	-
Total Overstrand				**48.347**	**347.269**	**48**	**6**

The table below gives a summary of the existing hydraulic design capacities and current flows at each of the WWTWs, as well as the final effluent quality compliance percentages for the 2022/2023 financial year.

Table A.3.5: Existing Hydraulic Design Capacities and Flows at each of the WWTWs (Ml/d)

WWTW	Existing Hydraulic Capacity	Peak Month Average Daily Flow	Average Daily Flow (2022/2023)	Average Wet Weather Flow (Jun'23, Jul'22, Aug'22)	Average Daily Flow as a % of Design Capacity	Final Effluent Compliance for 2022/2023 against *Authorisation*
Kleinmond	0.997	3.015 (Jun)	1.591	2.051	159.6%	Microbiological: 91.7% Chemical: 54.2% Physical: 83.3% *General Limits*
Hawston	0.700	1.469 (Jun)	0.726	0.958	103.7%	Microbiological: 100.0% Chemical: 54.2% Physical: 72.2% *General Limits*
Hermanus	12.000	14.529 (Jun)	8.076	10.095	67.3%	Microbiological: 91.7% Chemical: 89.6% Physical: 100.0% *Licence 17 October 2016*
Stanford	1.2000	1.229 (Jun)	1.042	1.182	86.8%	Microbiological: 33.3% Chemical: 97.9% Physical: 94.4% *General Limits*
Gansbaai	2.000	1.115 (Jun)	0.997	0.989	49.9%	Microbiological: 16.7% Chemical: 66.7% Physical: 88.9% *General Limits*
Eluxolweni	0.259	0.135 (Jun)	0.098	0.078	37.8%	Microbiological: 83.3% Chemical: 72.9% Physical: 25.0% *General Limits*

Note: Where parameters were resampled, due to failures, the resampled results were used to calculate the above compliance percentages.

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

Table A.3.6: Existing Organic Design Capacities and Loadings at the WWTWs

WWTW	Organic Design Capacity (kg COD/d)	2022/2023		2021/2022		2020/2021	
		Average Load (kg COD/d)	% of Design Capacity	Average Load (kg COD/d)	% of Design Capacity	Average Load (kg COD/d)	% of Design Capacity
Kleinmond	843	1 050 *	124.6%	1 045	124.0%	1 133	134.4%
Hawston	968	850	87.8%	1 234	127.5%	1 748	180.6%
Hermanus	9 000	6 221	69.1%	4 696 *	52.2%	4 935	54.8%
Stanford	1 200	1 033	86.1%	933	77.8%	1 116	93.0%
Gansbaai	3 600	1 405	39.0%	979	27.2%	1 136	31.6%
Eluxolweni	198	267	134.8%	190	96.0%	103	52.0%

Note: Extremely high COD readings of September 2021 for Hermanus WWTW and March 2023 for Kleinmond WWTW were not taken into account

Rooi Els, Pringle Bay, Betty's Bay, De Kelders, Franskraal, Baardskeerdersbos and Buffeljags Bay are not currently serviced by a sewer reticulation system. The towns of Kleinmond, Fisherhaven, Hawston, Hermanus, Stanford, Gansbaai, Kleinbaai and Pearly Beach are partially serviced by a sewer system.

The Community Survey of 2016 from Statistics South Africa estimate the 2016 population for Overstrand Municipality at 93 466 persons and the permanent households at 35 739, at an average household size of 2.6 persons per household.

Overstrand Municipality's Spatial Development Framework (SDF), May 2020, estimated the 2019 population at 116 550 persons. The SDF indicated that the population of the Overstrand Municipality grew at an approximate rate of 3% per annum between 2011 and 2016, and that future growth will continue to be between 2.8% and 3.3% per annum.

The 2022 Socio Economic Profile of Overstrand Municipality (Western Cape Government) indicates the 2022 population of Overstrand Municipality at 110 971 persons and the 2021 households at 30 427. The Municipality's Final IDP of 31 May 2023 (Final IDP Review, 2023/2024) indicates the 2022 projected population at 110 971 persons and the permanent households for the 2021/2022 financial year at 36 076.

The on-going in-migration into the Overstrand Municipal area will place increasing demands on the infrastructure and available space for urban growth. The increased footprint in the Municipal area needs careful management if it is not to impact negatively on the natural environment of Overstrand. The increased population growth will place increased pressure on the municipal resources to develop new as well as maintain existing infrastructure.

The 2022/2023 populations for the various water distribution systems were estimated by applying the annual growth rates as indicated in the table below. The current population figures and the annual population growth percentages used in the WSDP Performance- and Water Services Audit Report are aligned with the figures used in DWS's GeoDatabase.

The future estimated annual population growth percentages, as listed in the table below, were agreed with the Municipality's Community Services and Engineering Planning Departments during January 2014.

Table A.3.7: Estimated Future Annual Population Growth Percentages, Population and Households per Distribution System			
Town	**Estimated future annual Population Growth %**	**Projected 2022/2023 Persons**	**Projected 2022/2023 Households**
Buffels River	4.15%	3 593	1 811
Kleinmond	2.50%	8 698	3 586
Greater Hermanus	4.45%	76 410	25 213
Stanford	2.65%	6 375	1 991
Greater Gansbaai	4.89%	22 531	7 875
Pearly Beach	2.11%	1 317	610
Baardskeerdersbos	0.50%	129	41
Buffeljags Bay	0.50%	155	35
Farms	1.56%	5 604	2 127
Total	**4.08%**	**124 812**	**43 289**

The tables below give an overview of the projected population and permanent number of households and the water and sanitation service levels in Overstrand Municipality's Management Area.

Table A.3.8: Water Services Overview (Water)

Settlement Type	2011/2012 Households	2011/2012 Population	2022/2023 Households	2022/2023 Population	Water category: Adequate: Formal	Adequate: Informal	Adequate: Shared Services	Water resources needs only	O&M needs only	Infrastructure needs only	Infrastructure & O&M needs	Infrastructure, O&M & Resource need	No Services: Informal	No Services: Formal
URBAN														
Metropolitan Area					Adequate			Below RDP					None	
Sub-Total	**0**	**0**	**0**	**0**										
Formal Town					Adequate			Below RDP					None	
Buffels River	1 158	2 297	1 811	3 593	P		P							
Kleinmond	2 351	5 101	2 572	4 642	P		P							
Greater Hermanus	14 256	41 884	17 316	44 822	P		P							
Stanford	1 379	4 325	1544	4 587	P		P							
Greater Gansbaai	3 251	7 698	6214	15 887	P		P							
Pearly Beach	314	363	484	813	P		P							
Baardskeerdersbos	39	122	41	129	P									
Buffeljags Bay	33	147	20	95	P									
Sub-Total	**22 781**	**61 937**	**30 001**	**74 566**										
Townships					Adequate			Below RDP					None	
Sub-Total	**0**	**0**	**0**	**0**										
Informal Settlements					Adequate			Below RDP					None	
Greater Gansbaai	1 407	5 628	1 661	6 644		P								
Greater Hermanus	1 362	5 448	7 897	31 588		P								
Kleinmond	382	1 528	1 014	4 056		P								
Stanford	114	456	447	1 788		P								
Pearly Beach	171	684	126	504		P								
Buffeljags Bay			15	60		P								
Sub-Total	**3 436**	**13 744**	**11 160**	**44 640**										
Working towns & service centres					Adequate			Below RDP					None	
Sub-Total	**0**	**0**	**0**	**0**										
Sub-Total: (Urban)	**26 217**	**75 681**	**41 161**	**119 206**										
RURAL														
Rural / Farming					Adequate			Below RDP					None	
Overstrand Rural	1 794	4 727	2 127	5 604	P		P							P
Sub-Total	**1 794**	**4 727**	**2 127**	**5 604**										
Informal Settlements					Adequate			Below RDP					None	
Sub-Total	**0**	**0**	**0**	**0**										
Sub-Total (Rural)	**1 794**	**4 727**	**2 127**	**5 604**										
TOTAL	**28 011**	**80 408**	**43 288**	**124 811**										

Table A.3.9: Water Services Overview (Sanitation)

Settlement Type	2011/2012 Households	2011/2012 Population	2022/2023 Households	2022/2023 Population	Sanitation category: Adequate: Formal	Adequate: Informal	Adequate: Shared Services	Water resources needs only	O&M needs only	Infrastructure needs only	Infrastructure & O&M needs	Infrastructure, O&M & Resource need	No Services: Informal	No Services: Formal
URBAN														
Metropolitan Area					Adequate			Below RDP					None	
Sub-Total	**0**	**0**	**0**	**0**										
Formal Town					Adequate			Below RDP					None	
Buffels River	1 158	2 297	1 811	3 593	P		P							
Kleinmond	2 351	5 101	2 572	4 642	P		P							
Greater Hermanus	14 256	41 884	17 316	44 822	P		P							
Stanford	1 379	4 325	1 544	4 587	P		P							
Greater Gansbaai	3 251	7 698	6 214	15 887	P		P							
Pearly Beach	314	363	484	813	P		P							
Baardskeerdersbos	39	122	41	129	P									
Buffeljags Bay	33	147	20	95	P									
Sub-Total	**22 781**	**61 937**	**30 001**	**74 566**										
Townships					Adequate			Below RDP					None	
Sub-Total	**0**	**0**	**0**	**0**										
Informal Settlements					Adequate			Below RDP					None	
Greater Gansbaai	1 407	5 628	1 661	6 644		P								
Greater Hermanus	1 362	5 448	7 897	31 588		P								
Kleinmond	382	1 528	1 014	4 056		P								
Stanford	114	456	447	1 788		P								
Pearly Beach	171	684	126	504		P								
Buffeljags Bay			15	60		P								
Sub-Total	**3 436**	**13 744**	**11 160**	**44 640**										
Working towns & service centres					Adequate			Below RDP					None	
Sub-Total	**0**	**0**	**0**	**0**										
Sub-Total: (Urban)	**26 217**	**75 681**	**41 161**	**119 206**										
RURAL														
Rural / Farming					Adequate			Below RDP					None	
Overstrand Rural	1 794	4 727	2 127	5 604	P		P							P
Sub-Total	**1 794**	**4 727**	**2 127**	**5 604**										
Informal Settlements					Adequate			Below RDP					None	
Sub-Total	**0**	**0**	**0**	**0**										
Sub-Total (Rural)	**1 794**	**4 727**	**2 127**	**5 604**										
TOTAL	**28 011**	**80 408**	**43 288**	**124 811**										

B. WSDP PERFORMANCE REPORT

B.1. WSDP Reference and Status

Overstrand Municipality WSDP was updated during the 2021/2022 financial year for the next five-year WSDP Cycle (2022-2027). The following documents form part of Overstrand Municipality's updated WSDP.

- Administration, Information and Comprehensive Overview Report.
- Future Demand and Functionality Requirements Report.
- 2022/2023 WSDP IDP Water Sector Input Report

The following process was followed for the approval of the updated WSDP.

- The draft WSDP documents was taken to Council on the 30th of March 2022 for approval.
- The draft 2022/2023 WSDP-IDP Water Sector Input report was advertised and placed on the Municipality's website for public comment.
- The draft 2022/2023 WSDP-IDP Water Sector Input Report was distributed to the DWS, the DLG and the neighbouring WSAs for their comments.
- Comments received on the draft WSDP documents were incorporated, where after the WSDP documents were finalised and taken to Council for final approval (31 May 2022).

The table below gives an overview of Overstrand Municipality's WSDP status.

Table B.1.1: WSDP and Reporting Reference

Nr	WSDP Title and Reference	Status	Date	WSDP Year	Financial Year	Reporting year
1	2022-2027 WSDP	Drafted:	30/03/2022	Year 1	2018/19	Year - 4
		Comment submit:	29/04/2022	Year 2	2019/20	Year - 3
		Finalised:	30/05/2022	Year 3	2020/21	Year - 2
		Adopted:	31/05/2022	Year 4	2021/22	Year - 1
		Published:	01/06/2022	Year 5	**2022/23**	Year 0

Legend:

- Past Financial Years
- Previous Financial Year (financial year of reporting)
- Future Years

B.2. Performance on Water Services Objectives and Strategies

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

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

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

The table below gives an overview of the Municipality's performance on the water and sanitation objectives and strategies per WSDP topic.

Table B.2.1: Performance on Water Services Objectives and Strategies per WSDP Topic

Nr	Objective / Strategy	Key Performance Indicator	Inclusion (yes/no)		WSDP Year 1		WSDP Year 2		WSDP Year 3		WSDP Year 4		WSDP Year 5	
					FY 1	2018/19	FY 2	2019/20	FY 3	2020/21	FY 4	2021/22	FY 5	2022/23
			WSDP	IDP	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
WSDP Topic 1: Administration														
WSDP Topic 2: Demographics														
WSDP Topic 3: Service levels														
D1657	Provision of cleaned piped water to all formal HH within 200m from households	Number of formal HH that meet agreed service standards for piped water	Yes	Yes	30 209	29 800	29 800	29 946	29 946	30 111	30 111	30 990	30 412	31 829
D1661	Provision of sanitation services to formal residential households	Number of formal residential HH which are billed for sewerage in accordance to the SAMRAS financial system.	Yes	Yes	29 841	29 631	29 631	30 060	30 060	30 420	30 420	31 394	30 724	32 323
D1660	The provision of sanitation services to informal households based on the standard of 1 toilet to 5 households	Number of toilet structures provided in relation to the number of informal households.	Yes	Yes	790	881	884	885	930	934	980	983	1020	1107
D1663	Provision of sanitation services to informal households on invaded land with available funding.	The number of toilets provided for informal households on invaded land with available funding.	No	Yes	120	120	130	137	105	139	95	143	105	171
D1656	Provision of water to informal households based on the standard of 1 water point to 25 households	The number of taps installed in relation to the number of informal households	Yes	Yes	239	284	285	317	300	341	320	464	328	658
D1662	Provision of water to informal households on invaded land with available funding.	The number of taps installed for informal households on invaded land with available funding.	No	Yes	84	88	98	104	80	80	70	82	80	99
WSDP Topic 4: Socio economic														
WSDP Topic 5: Water Services Infrastructure														
WSDP Topic 5: Water Services Infrastructure														
WSDP Topic 6: Operation Maintenance														
D1714	Quality of effluent comply 80% with general or special limit in terms of the Water Act	% compliance	Yes	Yes	90%	95.77%	90%	86.34%	90%	79.16%	75%	80.08%	80%	75.54%
D1715	Quality of potable water comply 95% with SANS 241	% compliance with SANS 241	Yes	Yes	-	-	95%	98.45%	95%	98.83%	95%	97.83%	98%	96.99%
D1711	Monthly monitoring of water and waste water quality results of all treatment plants and reporting to DWS via website	Number of months monitored	Yes	Yes	12	12	12	12	12	12	12	12	12	12
WSDP Topic 7: Associated services														
WSDP Topic 8: Conservation and Demand management														
	Completion of works orders within the next calendar month for water distribution services: Gansbaai Water	% compliance with the completion time	-	-	92%	97.17%	92%	97.25%	92%	98.55%	92%	99.41%	-	-
	Completion of works orders within the next calendar month for water distribution services: Hangklip/Kleinmond Water	% compliance with the completion time	-	-	92%	93.13%	92%	95.12%	92%	94.00%	92%	93.72%	-	-
	Completion of works orders within the next calendar month for water distribution services: Hermanus Water	% compliance with the completion time	-	-	92%	99.67%	92%	99.88%	92%	99.69%	92%	99.80%	-	-
	Completion of works orders within the next calendar month for water distribution services: Stanford Water	% compliance with the completion time	-	-	92%	96.43%	92%	92.17%	92%	96.60%	92%	100.00%	-	-
D1654	Limit unaccounted water to less than 25% {(Number of kilolitre water purified - Number of kilolitre water sold)/Number of kilolitre purified x 100	% of water unaccounted for	Yes	Yes	19%	21.54%	19%	23.00%	19%	28.26%	18%	24.04%	25%	24.48%

Table B.2.1: Performance on Water Services Objectives and Strategies per WSDP Topic

Nr	Objective / Strategy	Key Performance Indicator	Inclusion (yes/no)		WSDP Year 1		WSDP Year 2		WSDP Year 3		WSDP Year 4		WSDP Year 5	
					FY 1	2018/19	FY 2	2019/20	FY 3	2020/21	FY 4	2021/22	FY 5	2022/23
			WSDP	IDP	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
	Completion of works orders within the next calendar month for Sewerage maintenance (network and tankers): Gansbaai	% compliance with the completion time	-	-	92% 98%	98.58% 100%	92% 98%	99.08% 100%	92% 98%	97.92% 100%	92% 98%	98.08% 100.0%	-	-
	Completion of works orders within the next calendar month for Sewerage maintenance (network and tankers): Hangklip/Kleinmond Water	% compliance with the completion time	-	-	92% 98%	97.22% 100%	92% 98%	99.01% 100%	92% 98%	97.18% 100%	92% 98%	97.88% 100.0%	-	-
	Completion of works orders within the next calendar month for Sewerage maintenance (network and tankers): Hermanus	% compliance with the completion time	-	-	92% 98%	99.08% 100%	92% 98%	99.42% 100%	92% 98%	99.61% 99.99%	92% 98%	99.64% 100.0%	-	-
	Completion of works orders within the next calendar month for Sewerage (network and tankers): Stanford	% compliance with the completion time	-	-	92% 98%	95.33% 99.92%	92% 98%	98.92% 99.75%	92% 98%	96.06% 99.75%	92% 98%	100.0% 100.0%	-	-
WSDP Topic 9: Water Resources														
WSDP Topic 10: Financial profile														
WSDP Topic 11: Institutional Arrangements Profile														
D1718	Report on the implementation of the Water Service Development plan annually by the end of October	Report submitted	Yes	Yes	1	1	1	1	1	1	1	1	1	1
WSDP Topic 12: Social and Customer service requirements														
D1587	Maintenance of sanitation services (tankers and networks) measured by the daily recording/completion of enquiries within 30 days.	% completed	Yes	Yes	92%	99.00%	92%	99.75%	92%	99.53%	92%	99.70%	92%	99.60%
D1589	Maintenance of water services measured by the daily recording/completion of enquiries/completed within 30 days.	% completed	Yes	Yes	-	-	92%	99.25%	92%	98.05%	92%	99.00%	92%	94.93%
WSDP Topic 13: Needs development plan														

Legend:

	Past Financial Years
	Previous Financial Year (financial year of reporting)
	Future Years

The following water and sanitation related investigations were successfully completed during the last financial year.

- The Water Services Audit Report for 2021/2022 was finalised and approved by Council as part of the Annual Report. The NRW water balance models were updated for each of the distribution systems (Up to the end of June 2022) as part of the Water Services Audit Process.
- Overstrand Municipality continues with the implementation of their Drinking Water Quality and Effluent Quality Sampling Programmes (Both Operational and Compliance Monitoring). Sample results are loaded monthly onto DWS's IRIS. All the WTWs and WWTWs are registered on the IRIS website. The quality of the treated effluent re-used for irrigation purposes from the Hermanus- and Gansbaai WWTW is also sampled monthly.
- Overstrand Municipality is continuing with their Groundwater Monitoring and Management Programmes.
- The Asset Register was updated to include all the water and sewerage capital projects completed during the 2022/2023 financial year.
- The following Technical investigations were completed during the 2022/2023 financial year:
  - Water Source Development and Management Plan for the Overstrand Local Municipality. Baardskeerdersbos Wellfield Annual Monitoring Report, Umvoto, October 2021 to September 2022.
  - Gansbaai Groundwater Monitoring at the WWTW and Communal Sports Centre. Gansbaai Annual Groundwater Monitoring Report, Umvoto, October 2021 to September 2022.
  - Water Resource Development and Management Plan for the Hermanus Area. Gateway, Camphill and Volmoed Wellfields Annual Monitoring Report, Umvoto, October 2021 to September 2022.
  - Water Resource Development and Management Plan for the Stanford Area. Kouevlakte Wellfield Annual Monitoring Report, Umvoto, October 2021 to September 2022.
  - Overstrand Water and Wastewater Treatment Plants. Various Site Investigation Report, Zutari, November 2022.
  - Basic Assessment Report for the Hemel and Aarde Wellfield Augmentation, Umvoto, April 2023.
  - Technical Report: Upgrading of the Kleinmond WWTW, Zutari, June 2023.
  - Report on the technical and environmental assessment of the Onrus Main Sewerage Pumpstation, Lyners, June 2023.

The Municipality also received the following awards / acknowledgements:

- **Overstrand Municipality performed well with regard to DWS's 2021 Blue Drop Progress Assessment (Drinking Water Process and Quality). The Blue Drop Risk Ratings for all eight systems were in the low-risk category (<50%).** The risk ratings were determined based on the following system specific risk indicators.
  - Design capacity;
  - Operational capacity;
  - Water Quality Compliance;
  - Technical Skills; and
  - Water Safety Plans.
- **Overstrand Municipality's performing above average with regard to wastewater quality management, with an overall Green Drop Score of 89% for DWS's 2021 assessment.** The Green Drop Scores for all six WWTWs were between 88% and 96% (Six potential Green Drop Certified Systems). The Wastewater Risk Ratings were at low risk (<50%) for the Gansbaai-, Hermanus- and Kleinmond WWTW and at medium risk for the Pearly Beach-, Stanford- and Hawston WWTW (50% - <70%).

Overstrand Municipality was also acknowledged by the DWS as one of the Top 3 Best Performing Municipalities for their Green Drop Results.

- **Overstrand Municipality won the "2022 Municipal Green Economy Change Champions" Showcase**, for championing sustainability and innovation in municipal service provision through outsourcing the operation and maintenance of bulk water and wastewater facilities.

B.3. Status of Water Services Projects

Overstrand Municipality completed or continued with the following key water and sewerage capital infrastructure projects during the 2022/2023 financial year.

- Various sections of the water reticulation networks and sewer drainage networks and pump stations were upgraded as recommended in the Water and Sewer Master Plans. Sections of the old water reticulation networks were also replaced (Implementation of the Pipeline Replacement Programme).
- The Municipality continued with the Hermanus Wellfield Phase 2 upgrade project, including the basic assessment process for the upgrade of the wellfields in the Hemel-en-Aarde valley.
- The Municipality continued with the provision of communal water and sanitation services for the informal areas.
- The RO tank at the De Kelders WTW was replaced and the filters at the Franskraal WTW were refurbished.
- The MCC Panel of the Kraaibosch Dam raw water pump stations was refurbished.
- The Municipality completed the upgrade of the access roads to the Kleinmond and Buffels River WTWs.
- New fencing was installed at some of the water and sewerage infrastructure facilities to improve security.
- The Gansbaai sewer network was extended.
- A new Archimedes Screw pumpstation was completed at the Hermanus WWTW inlet works.
- The Municipality started with the refurbishment and upgrade of the Kleinmond WWTW.
- The rerouting of the treated effluent irrigation pipeline from the Hermanus WWTW was completed.

The capital expenditure for the water and sewerage infrastructure for the 2022/2023 financial year is indicated in the table below.

Table B 3.1: Water Services Projects Status and Performance

Nr	Project Title and Description	Inclusion		Total Project Cost R'000	Project Progress (%)	Year 0 Performance - FY2022/23			Funding Source(s)	Project Category / Type	Planned Period		Project Status	Actual Completion Year
		WSDP	IDP			FY Budget R'000	Expended R'000	%			From FY	To FY		
1	Refurbishment of Bulk Water Infrastructure	Yes	Yes	R8 929	43%	R952	R952	100%	EL 23/24	Water	2020/2021	2027/2028	In progress	-
2	Fencing at Water Installations	Yes	Yes	R6 294	59%	R644	R644	100%	EL 23/24	Water	2018/2019	2027/2028	In progress	-
3	Replacement of Overstrand Water Pipes	Yes	Yes	R106 587	68%	R15 972	R12 522	78%	EL 22 R/O - EL 23/24/25	Water	2013/2014	2027/2028	In progress	-
4	Water facilities (Contingency)	Yes	Yes	R8 730	71%	R1 274	R1 262	99%	EL 23/24/25	Water	2015/2016	2027/2028	In progress	-
5	Upgrade Hermanus Well Fields Phase 2	Yes	Yes	R25 577	30%	R4 803	R4 191	87%	EL 21 R/O - EL 23/24/25	Water	2021/2022	2026/2027	In progress	-
6	Access Roads to Kleinmond Buffels River WTW Upgrade	Yes	Yes	R4 091	100%	R1 000	R993	99%	EL 23	Water	2020/2021	2022/2023	Completed	2022/2023
7	Emergency housing project Schulphoek	No	Yes	R0	0%	R0	R0	-	Surplus-Non tariff - R/O-22	Water	2022/2023	2022/2023	Not implemented	-
8	EHP Water provision for informal settlements	No	Yes	R672	100%	R178	R119	67%	Surplus-Non tariff - R/O-22	Water	2020/2021	2022/2023	Completed	2022/2023
9	Upgrade Water Lines & New Booster Pumpstation Valves	No	Yes	R4 645	100%	R4 645	R4 645	100%	MIG	Water	2022/2023	2022/2023	Completed	2022/2023
10	Upgrade Bulk Water	Yes	Yes	R4 291	100%	R4 291	R4 291	100%	MIG	Water	2022/2023	2022/2023	Completed	2022/2023
11	Refurbisch Kraaibosch Pump Station Panel	No	Yes	R1 000	100%	R1 000	R1 000	100%	EL 23	Water	2022/2023	2022/2023	Completed	2022/2023
12	De Kelders WTW Membrane Replacement	Yes	Yes	R1 426	44%	R630	R626	99%	EL 23/25	Water	2022/2023	2024/2025	In progress	-
13	Franskraal WTW Filters Refurbish	Yes	Yes	R362	100%	R400	R362	91%	EL 23	Water	2022/2023	2022/2023	Completed	2022/2023
14	Sewerage Facilities (Contingency)	Yes	Yes	R8 331	58%	R650	R626	96%	EL 23/24/25	Sewerage	2015/2016	2027/2028	In progress	-
15	Kleinmond WWTW Refurbish Upgrade	Yes	Yes	R44 242	27%	R9 478	R9 478	100%	EL22 R/O, EL23/24/25, WSIG	Sewerage	2020/2021	2023/2024	In progress	-
16	Fencing at Sewerage Installations	Yes	Yes	R8 075	58%	R350	R350	100%	EL 23/24/25	Sewerage	2018/2019	2027/2028	In progress	-
17	Upgrading of pumpstations rising mains	Yes	Yes	R43 665	71%	R17 291	R17 291	100%	WSIG, EL22 RO	Sewerage	2020/2021	2027/2028	In progress	-
18	Emergency housing project Schulphoek (Zwelihle, Ward 6)	No	Yes	R0	0%	R0	R0	-	Surplus-Non tariff R/O-22	Sewerage	2022/2023	2022/2023	Not implemented	-
19	EHP sewer provision for informal settlements	No	Yes	R1 399	100%	R416	R278	67%	Surplus-Non tariff R/O-22	Sewerage	2020/2021	2022/2023	Completed	2022/2023
20	Gansbaai CBD Sewer Network Extension	Yes	Yes	R7 348	100%	R2 000	R2 000	100%	EL 22-R/O	Sewerage	2021/2022	2022/2023	Completed	2022/2023
21	Reroute Hermanus WWTW Treated Effluent Irrigation Pipeline	Yes	Yes	R1 100	100%	R1 100	R1 100	100%	EL23/25	Sewerage	2022/2023	2022/2023	Completed	2022/2023
	Total			**R286 765**		**R67 074**	**R62 731**	**94%**						

B.4. Past Financial Year Water Services Projects Impact Declaration

The impacts of the water and sewerage capital projects, which were implemented by Overstrand Municipality in the previous financial year, were as follows:

Table B.4.1: Past Financial Year Project Impact Declaration

Nr	Project Title and Description	Project Category	Settlements which benefitted	Nr Beneficiaries		Impact Declaration
				Households	Population	
1	Refurbishment of Bulk Water Infrastructure	Bulk water pipelines	Management Area	32	92	Ensure adequate bulk water pipeline capacity.
2	Fencing at Water Installations	Security	Management Area	-	-	Improve security at water infrastructure.
3	Replacement of Overstrand Water Pipes	Reticulation	Management Area	417	1210	Implement Pipeline Replacement Programme to reduce NRW and Water Losses.
4	Water facilities (Contingency)	WTW	Management Area	-	-	Ensure adequate O&M of existing water facilities.
5	Upgrade Hermanus Well Fields Phase 2	Resources	Hermanus	25213	76410	Increase security of supply through additional groundwater development.
6	Access Roads to Kleinmond Buffels River WTW Upgrade	WTW	Kleinmond and Buffels River	-	-	Improve access to WTWs.
7	Emergency housing project Schulphoek	Basic water services	Hermanus	-	-	Project was not implemented.
8	EHP Water provision for informal settlements	Basic water services	Management Area	1049	4194	Ensure basic communal water services for informal areas.
9	Upgrade Water Lines & New Booster Pumpstation Valves	Reticulation	Gansbaai	1 479	4230	Ensure adequate water reticulation capacity.
10	Upgrade Bulk Water	Bulk water pipelines	Standford	783	2506	Ensure adequate bulk water pipeline capacity.
11	Refurbisch Kraaibosch Pump Station Panel	Pump Station	Greater Gansbaai	-	-	Ensure adequate raw water pump capacity.
12	De Kelders WTW Membrane Replacement	WTW	Greater Gansbaai	-	-	Ensure SANS241:2015 water quality compliance for Treatment Works.
13	Franskraal WTW Filters Refurbish	WTW	Greater Gansbaai	-	-	Ensure SANS241:2015 water quality compliance for Treatment Works.
14	Sewerage Facilities (Contingency)	Security	Management Area	-	-	Ensure adequate O&M of existing sewerage facilities.
15	Kleinmond WWTW Refurbish Upgrade	WWTW	Kleinmond	3586	8698	Ensure adequate treatment capacity and final effluent quality discharged from the WWTW complies with the legal quality requirements.
16	Fencing at Sewerage Installations	Security	Management Area	-	-	Improve security at sewerage installations.
17	Upgrading of pumpstations rising mains	Sewer pump station	Hermanus	17870	54146	Ensure adequate pump station capacity and rising main capacity.
18	Emergency housing project Schulphoek (Zwelihle, Ward 6)	Basic services	Hermanus	-	-	Project was not implemented.
19	EHP sewer provision for informal settlements	Basic services	Management Area	452	1810	Ensure basic communal sanitation services for informal areas.
20	Gansbaai CBD Sewer Network Extension	Bulk sewer pipeline	Gansbaai	67	191	Installation of waterborne sewer system.
21	Reroute Hermanus WWTW Treated Effluent Irrigation Pipeline	WWTW	Hermanus	-	-	Re-use treated effluent for irrigation, in order to reduce potable water requirements.
	TOTAL			**50948**	**153487**	

C. WATER SERVICES AUDIT REPORT

C.1. Quantity of Water Services Provided (Water Balance)

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

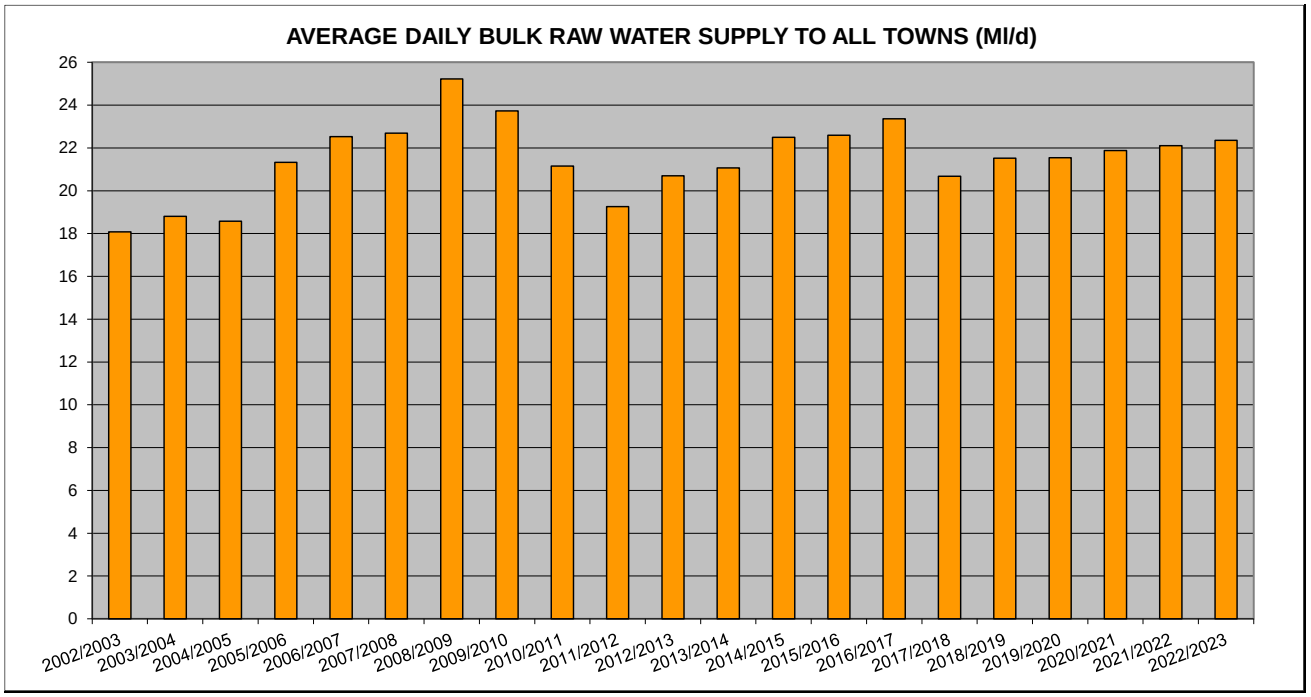


Figure C.1.1: Average Daily Bulk Raw Water Supply to all Towns in Overstrand Municipality

The graph below gives an overview of the system input volume and NRW for the various distribution systems in Overstrand Municipality's Management Area.

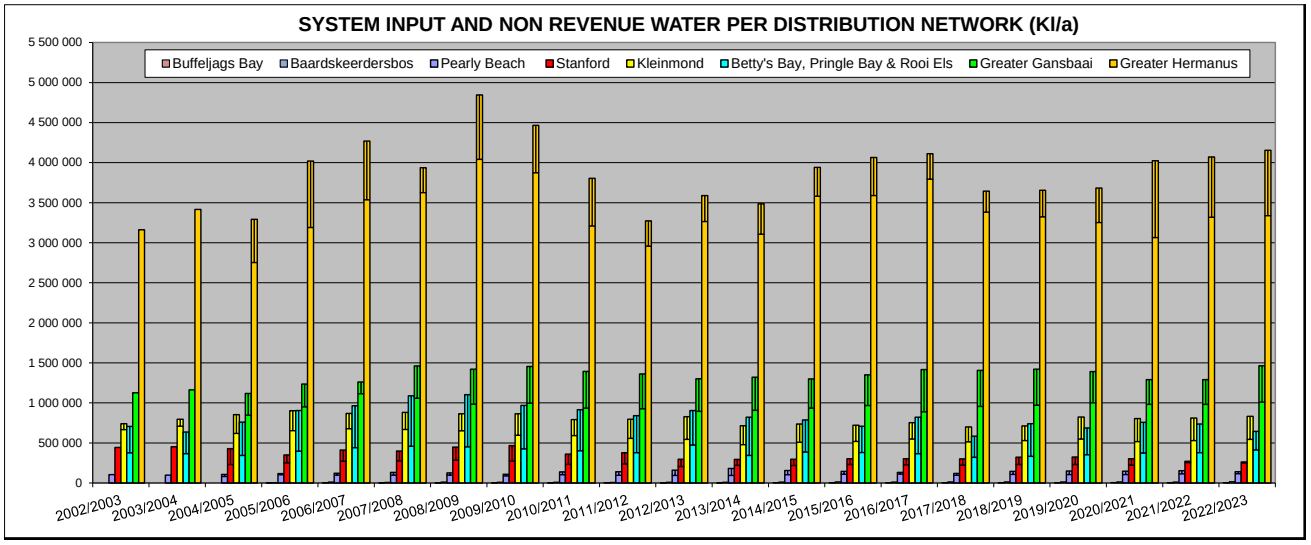


Figure C.1.2: System Input Volume and Non-Revenue Water for the Various Distribution Systems

Quantity of water provided by the WSA

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

Table C.1.1: Bulk Raw Water Supply to the Various Towns

Distribution System	Source	22/23	Record: Prior (Ml/a)				
			21/22	20/21	19/20	18/19	17/18
Buffels River	Buffels River Dam	671.598	788.232	772.751	767.993	801.120	649.669
Kleinmond	Palmiet River and Dorpsfontein spring	918.124	871.522	880.390	898.489	779.610	716.358
Greater Hermanus	De Bos Dam and Groundwater	4 267.244	4 265.761	4 242.199	4 128.705	4 141.553	4 182.703
Stanford	Stanford spring and two Boreholes	498.341	468.903	446.512	365.453	374.810	321.479
Greater Gansbaai	Kraaibosch and Franskraal Dam, Klipgat, De Kelders Grotte	1 631.362	1 480.781	1 467.816	1 524.604	1 559.727	1 529.544
Pearly Beach	Pearly Beach Springs and Koekemoer Dam	148.586	158.837	153.406	155.368	174.354	126.233
Baardskeerdersbos	Two Boreholes	19.274	16.838	17.741	18.311	18.077	17.154
Buffeljags Bay	Borehole	5.872	5.504	5.879	5.019	4.912	4.966
Total Supply to all towns		**8 160.401**	**8 056.378**	**7 986.694**	**7 863.942**	**7 854.163**	**7 548.106**

Voorberg reservoir outlet (Buffels River)

Kleinmond WTW (Outlet flow)

Pearly Beach WTW (Supply from Koekemoer and Pearly Beach dams)

Stanford RO Plant (Filter feed meter)

The table below gives an overview of the quantity of water services provided / water balance for all the distribution systems in Overstrand Municipality's Management Area.

Table C.1.2: Quantity of Water Services Provided / Water Balance								
WSDP Ref. #	Regulations Ref. #	Description	m^3 per annum			Ml/d		
			Year 0	Year - 1	Year - 2	Year 0	Year - 1	Year - 2
			FY2022/23	FY2021/22	FY2020/21	FY2022/23	FY2021/22	FY2020/21
		RAW WATER						
7.2.1		Surface water purchased	0	0	0	0.00	0.00	0.00
7.1 / 7.2.2		Surface water abstracted	6 278 617	5 803 773	5 714 114	17.20	15.90	15.66
7.1 / 7.2.3		Ground water abstracted	1 881 784	2 264 669	2 272 580	5.16	6.20	6.23
7.2.14		Effluent recycled	0	0	0	0.00	0.00	0.00
7.2.4		*less* Raw water supplied to others	0	0	0	0.00	0.00	0.00
7.2.5		**Sub-Total: Raw Water supplied**	**8 160 401**	**8 068 442**	**7 986 694**	**22.36**	**22.11**	**21.88**
	10.2 (g) (i)	**BULK WATER SUPPLY**						
7.2.6		Volume of water treated	7 521 759	7 354 597	7 350 903	20.61	20.15	20.14
7.2.7	10.2 (a) (ii)	Purchased treated water	0	0	0	0.00	0.00	0.00
7.2.7A		Ground water not treated	0	0	0	0.00	0.00	0.00
7.2.6A		*less* Treated water supplied to others	0	0	0	0.00	0.00	0.00
		Sub-Total: System Input Volume	**7 521 759**	**7 354 597**	**7 350 903**	**20.61**	**20.15**	**20.14**
		WATER CONSUMPTION						
7.2.8.1		Billed Metered:	5 680 780	5 586 420	5 273 591	15.56	15.31	14.45
	10.2 (a) (i)	Domestic	4 742 372	4 649 524	4 302 001	12.99	12.74	11.79
	10.2 (a) (i)	Commercial	450 815	420 391	364 371	1.24	1.15	1.00
	10.2 (a) (i)	Industrial	136 174	119 742	123 150	0.37	0.33	0.34
	10.2 (a) (i)	Other	351 419	396 763	484 069	0.96	1.09	1.33
7.2.8.2		Billed Unmetered	0	0	0	0.00	0.00	0.00
	10.2 (a) (i)	Domestic	0	0	0	0.00	0.00	0.00
	10.2 (a) (i)	Commercial	0	0	0	0.00	0.00	0.00
	10.2 (a) (i)	Industrial	0	0	0	0.00	0.00	0.00
	10.2 (a) (i)	Other	0	0	0	0.00	0.00	0.00
7.2.8.3		Unbilled Metered	2 029	3 591	1 233	0.01	0.01	0.00
7.2.8.4		Unbilled Unmetered	105 782	141 175	78 973	0.29	0.39	0.22
	10.2 (g) (i)	**Sub-Total: Authorized consumption**	**5 788 591**	**5 731 186**	**5 353 797**	**15.86**	**15.70**	**14.67**
		UNACCOUNTED FOR WATER						
7.3.1		Raw water bulk loss	638 642	713 845	635 791	1.75	1.96	1.74
7.2.3/7.2.4		Billing losses	107 811	144 766	80 206	0.30	0.40	0.22
7.2.5		Apparent losses	92 164	105 629	113 551	0.25	0.29	0.31
7.2.5.1		Illegal connections	34 663	32 468	39 942	0.09	0.09	0.11
7.2.5.2		Inaccurate meters	40 169	56 927	53 638	0.11	0.16	0.15
7.2.5.3		Data errors	17 332	16 234	19 971	0.05	0.04	0.05
7.2.6		Real losses	1 641 004	1 517 782	1 883 555	4.50	4.16	5.16
	10.2 (g) (ii)	**Sub-Total: Unaccounted for water**	**1 733 168**	**1 623 411**	**1 997 106**	**4.75**	**4.45**	**5.47**
		WASTEWATER TREATMENT						
7.2.9	10.2 (a) (iii)	Total received at WWTW	4 573 422	4 287 219	3 865 929	12.53	11.75	10.59
7.2.11		Total discharged	3 408 718	3 579 431	3 679 329	9.34	9.81	10.08
7.2.13		Returned to environment	2 892 548	2 971 543	2 743 548	7.92	8.14	7.52
7.2.14		Recycled	516 170	607 888	935 781	1.41	1.67	2.56
	10.2 (a) (iv)	**Quantity of water supplied not discharged to WWTW's**	**1 215 169**	**1 443 967**	**1 487 868**	**3.33**	**3.96**	**4.08**

Graphs of the water usage per sector for the various water distribution systems within Overstrand Municipality's Management Area are included as part of the IWA Water Balance Models in Annexure A.

Quantity of water used by each user sector:

The figure below gives an overview of Overstrand Municipality's overall water usage per Sector for the various financial years.

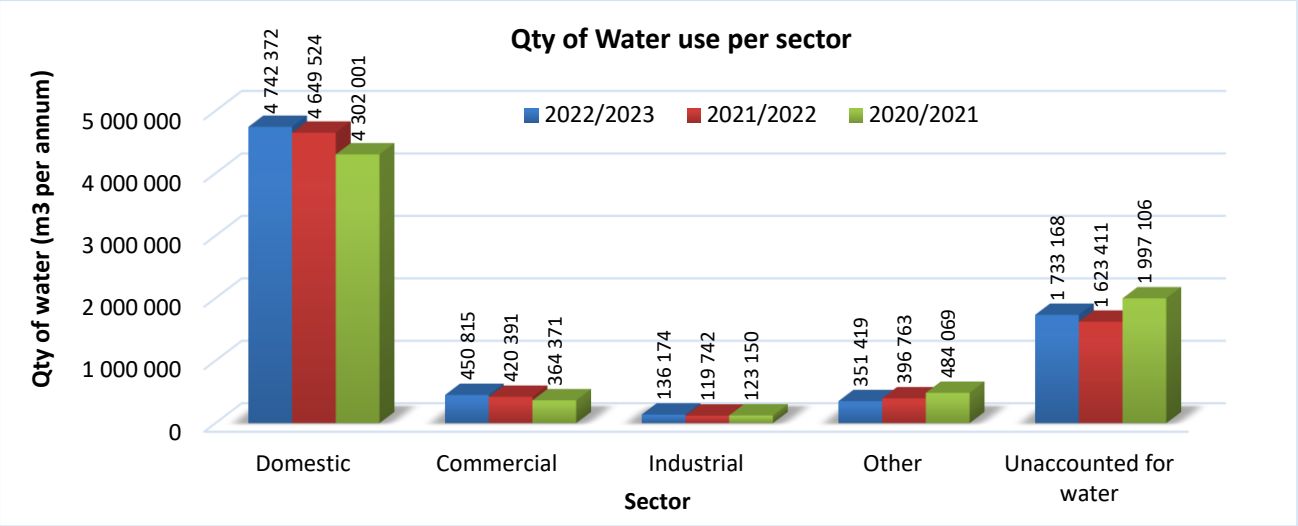


Figure C.1.3: Quantity of Water Services Provided / Water Balance

The table below gives a summary of the annual water usage per sector within the various water distribution systems in Overstrand Municipality's Management Area (Billed Consumption).

Table C.1.3: Quantity of Water Used by each User Sector (Ml/a)

Distribution System	Year	Residential	Commercial	Industrial	Other	Non-Revenue Water	Total
Buffels River	08/09	436.164	14.198			653.503	1 103.865
	09/10	401.211	23.202			543.764	968.177
	10/11	376.428	26.097			513.972	916.497
	11/12	359.945	18.703			463.088	841.736
	12/13	345.616	14.573	0.000	4.090	540.123	904.402
	13/14	319.371	14.663	0.000	9.623	478.209	821.866
	14/15	364.536	14.984	0.000	8.054	400.622	788.196
	15/16	360.949	16.044	0.000	4.056	327.463	708.512
	16/17	346.625	16.465	0.000	3.076	455.126	821.292
	17/18	302.592	15.437	0.000	1.965	265.104	585.098
	18/19	313.453	17.793	0.000	2.094	407.056	740.396
	19/20	335.936	14.113	0.000	3.067	335.271	688.387
	20/21	357.825	13.306	0.000	3.204	383.457	757.792
	21/22	361.210	14.043	0.000	3.296	358.678	737.227
	22/23	388.550	19.025	0.000	5.292	232.091	644.958
Kleinmond	08/09	592.430	58.758			212.481	863.669
	09/10	516.603	79.114			268.918	864.635
	10/11	490.549	101.716			198.745	791.010
	11/12	469.651	87.002			239.492	796.145
	12/13	454.817	41.068	0.000	49.406	283.500	828.791
	13/14	425.440	35.352	0.000	16.723	237.027	714.542
	14/15	452.666	40.617	0.000	15.721	227.374	736.378
	15/16	450.695	39.820	0.000	27.817	202.304	720.636
	16/17	439.966	45.341	0.000	63.656	203.625	752.588
	17/18	412.329	44.499	0.000	55.060	188.379	700.267
	18/19	425.380	43.827	0.204	59.441	183.409	712.261
	19/20	432.243	41.226	0.616	73.898	276.922	824.905

Table C.1.3: Quantity of Water Used by each User Sector (Ml/a)							
Distribution System	**Year**	**Residential**	**Commercial**	**Industrial**	**Other**	**Non-Revenue Water**	**Total**
	20/21	422.400	41.024	1.247	51.080	289.372	805.123
	21/22	428.239	41.729	1.376	57.744	281.074	810.162
	22/23	437.987	49.999	0.806	55.741	287.316	831.849
Greater Hermanus	08/09	3 584.199	456.956			805.122	4 846.277
	09/10	3 142.028	730.418			593.867	4 466.313
	10/11	2 599.228	610.599			594.352	3 804.179
	11/12	2 252.774	703.966			317.241	3 273.981
	12/13	2 558.602	249.186	59.830	396.120	324.189	3 587.927
	13/14	2 510.911	222.019	57.541	316.044	380.399	3 486.914
	14/15	2 796.733	258.324	68.291	456.693	359.729	3 939.770
	15/16	2 827.118	247.923	70.566	443.993	474.020	4 063.620
	16/17	2 915.073	248.026	68.614	562.588	317.045	4 111.346
	17/18	2 634.572	239.268	72.865	434.621	262.270	3 643.596
	18/19	2 516.253	249.022	68.057	488.253	332.685	3 654.270
	19/20	2 509.986	230.858	56.920	454.818	430.532	3 683.114
	20/21	2 542.047	211.139	65.232	244.886	960.986	4 024.290
	21/22	2 868.910	253.288	58.517	137.223	753.296	4 071.234
	22/23	2 848.181	254.798	64.680	168.822	816.989	4 153.470
Stanford	08/09	261.666	23.658			163.496	448.820
	09/10	212.914	60.553			194.486	467.953
	10/11	181.002	52.511			128.297	361.810
	11/12	176.753	60.348			142.029	379.130
	12/13	165.771	22.434	3.180	13.619	91.388	296.392
	13/14	162.686	34.172	5.818	16.626	76.516	295.818
	14/15	172.683	21.869	4.504	18.534	80.356	297.946
	15/16	181.474	23.032	6.002	19.607	73.438	303.553
	16/17	175.738	22.831	5.357	23.314	76.937	304.177
	17/18	170.569	21.954	4.726	24.514	78.723	300.486
	18/19	171.181	23.734	8.548	27.346	90.868	321.677
	19/20	176.335	21.408	8.714	25.474	93.141	325.072
	20/21	172.483	16.546	7.810	26.515	79.613	302.967
	21/22	187.249	20.403	4.497	42.414	17.035	271.598
	22/23	193.412	23.961	5.406	26.543	13.485	262.807
Greater Gansbaai	08/09	901.258	82.437			438.158	1 421.853
	09/10	685.179	312.121			457.580	1 454.880
	10/11	624.920	311.035			457.525	1 393.480
	11/12	675.065	251.814			435.335	1 362.214
	12/13	634.095	68.632	84.312	108.110	405.799	1 300.948
	13/14	620.628	69.442	65.987	151.687	413.621	1 321.365
	14/15	652.793	73.863	63.322	145.882	363.302	1 299.162
	15/16	647.941	64.996	82.285	170.803	384.841	1 350.866
	16/17	591.887	76.555	68.208	151.578	529.125	1 417.353
	17/18	631.340	83.517	83.633	157.117	449.900	1 405.507
	18/19	668.242	94.399	55.860	153.067	450.328	1 421.896
	19/20	695.208	86.324	58.131	161.247	390.657	1 391.567
	20/21	698.023	80.463	48.861	155.225	308.492	1 291.064
	21/22	686.619	88.469	55.352	152.124	308.847	1 291.411
	22/23	751.997	100.076	65.282	92.074	455.188	1 464.617
Pearly Beach	08/09	96.641	2.793			27.326	126.760
	09/10	85.002	3.513			21.683	110.198
	10/11	84.623	17.835			36.511	138.969
	11/12	93.424	2.429			45.689	141.542
	12/13	90.594	1.785	0.000	1.017	67.435	160.831
	13/14	88.605	2.322	0.000	2.494	87.708	181.129

Table C.1.3: Quantity of Water Used by each User Sector (Ml/a)							
Distribution System	**Year**	**Residential**	**Commercial**	**Industrial**	**Other**	**Non-Revenue Water**	**Total**
	14/15	97.815	2.868	0.000	2.964	52.640	156.287
	15/16	103.592	2.071	0.000	2.816	36.951	145.430
	16/17	106.401	1.495	0.000	2.713	21.928	132.537
	17/18	94.021	1.430	0.000	1.427	23.495	120.373
	18/19	101.500	2.080	0.000	2.672	38.499	144.751
	19/20	100.149	1.219	0.000	3.104	46.005	150.477
	20/21	100.005	1.492	0.000	2.835	44.318	148.650
	21/22	108.015	1.793	0.000	3.199	41.065	154.072
	22/23	111.715	2.136	0.00	1.685	25.787	141.323
Baardskeerdersbos	08/09	7.574	0.000			4.915	12.489
	09/10	7.809	0.000			2.722	10.531
	10/11	6.774	0.095			4.085	10.954
	11/12	6.327	0.390			2.778	9.495
	12/13	6.714	0.208	0.000	0.097	4.000	11.019
	13/14	5.749	0.164	0.000	0.074	5.665	11.652
	14/15	6.742	0.462	0.000	0.058	6.251	13.513
	15/16	7.466	0.392	0.000	0.132	6.654	14.644
	16/17	7.482	0.429	0.000	0.094	5.047	13.052
	17/18	7.616	0.308	0.000	0.032	6.752	14.708
	18/19	6.849	0.593	0.000	0.025	7.509	14.976
	19/20	8.254	0.454	0.000	0.025	6.941	15.674
	20/21	6.683	0.401	0.000	0.136	7.918	15.138
	21/22	7.067	0.666	0.000	0.020	5.883	13.636
	22/23	8.087	0.820	0.000	0.013	8.125	17.045
Buffeljags Bay	08/09	2.460	0.000			0.112	2.572
	09/10	2.582	0.000			0.000	2.582
	10/11	3.409	0.151			0.000	3.560
	11/12	3.281	0.595			0.019	3.895
	12/13	2.859	0.020	0.000	0.449	0.090	3.418
	13/14	2.927	0.001	0.000	0.326	0.004	3.258
	14/15	2.831	0.000	0.000	0.519	0.612	3.962
	15/16	2.928	0.000	0.000	0.815	0.705	4.448
	16/17	2.866	0.000	0.000	0.861	0.200	3.927
	17/18	2.885	0.000	0.000	1.185	0.373	4.443
	18/19	2.901	0.000	0.000	1.193	0.770	4.864
	19/20	2.863	0.000	0.000	1.365	0.930	5.158
	20/21	2.535	0.000	0.000	0.188	3.156	5.879
	21/22	2.215	0.000	0.000	0.743	2.299	5.257
	22/23	2.443	0.000	0.000	1.249	1.998	5.690
TOTAL	**08/09**	**5 882.392**	**638.800**			**2 305.113**	**8 826.305**
	09/10	**5 053.328**	**1 208.921**			**2 083.020**	**8 345.269**
	10/11	**4 366.933**	**1 120.039**			**1 933.487**	**7 420.459**
	11/12	**4 037.220**	**1 125.247**			**1 645.671**	**6 808.138**
	12/13	**4 259.068**	**397.906**	**147.322**	**572.908**	**1 716.524**	**7 093.728**
	13/14	**4 136.317**	**378.135**	**129.346**	**513.597**	**1 679.149**	**6 836.544**
	14/15	**4 546.799**	**412.987**	**136.117**	**648.425**	**1 490.886**	**7 235.214**
	15/16	**4 582.163**	**394.278**	**158.853**	**670.039**	**1 506.376**	**7 311.709**
	16/17	**4 586.038**	**411.142**	**142.179**	**807.880**	**1 609.033**	**7 556.272**
	17/18	**4 255.924**	**406.413**	**161.224**	**675.921**	**1 274.996**	**6 774.478**
	18/19	**4 205.759**	**431.448**	**132.465**	**734.091**	**1 511.124**	**7 015.091**
	19/20	**4 260.974**	**395.602**	**124.381**	**722.998**	**1 580.399**	**7 084.354**
	20/21	**4 302.001**	**364.371**	**123.150**	**484.069**	**2 077.312**	**7 350.903**
	21/22	**4 649.524**	**420.391**	**119.742**	**396.763**	**1 768.177**	**7 354.597**
	22/23	**4 742.372**	**450.815**	**136.174**	**351.419**	**1 840.979**	**7 521.759**

Quantity of effluent received at the WWTWs (Ml/a):

The inflow to all the WWTWs in Overstrand Municipality's Management Area is metered and the five-year history of the total inflow to the various WWTWs are summarised in the table below. The hydraulic and organic design capacities of the various WWTWs and the monthly flows and organic loads at the various plants, as well as the rainfall are included in Annexure A.

Table C.1.4: Quantity of Effluent Received at the Various WWTWs

WWTWs	22/23	Record: Prior (Ml/a)				
		21/22	20/21	19/20	18/19	17/18
Kleinmond	580.603	601.483	554.671	458.086	412.483	397.727
Hawston	264.910	291.700	222.561	157.316	149.776	121.982
Hermanus	2 947.775	2 645.129	2 357.005	2 157.670	2 222.640	2 195.970
Stanford	380.449	390.670	388.477	287.228	242.546	241.796
Gansbaai	363.738	320.462	313.684	319.058	304.848	300.253
Pearly Beach	35.947	37.775	29.531	16.333	-	-
Total	**4 573.422**	**4 287.219**	**3 865.929**	**3 395.691**	**3 332.293**	**3 257.728**

Quantity of treated effluent returned to the water resource system:

There is a need to report on the volume or proportion of treated effluent that is returned from each WWTW to the Water Resource System. These return flows can be significant and can add to the water resources of a catchment and need to be accounted for. In other instances, the effluent is not returned and is diverted to oxidation ponds or is re-used on parks, sports fields, etc.

All effluent discharged into the Municipal sewer systems are treated at the existing WWTWs and the total returns to the water resource system and the treated effluent re-used for irrigation purposes are summarised in the table below.

Table C.1.5: Total Returns to the Water Resource System and Treated Effluent re-used for Irrigation Purposes

WWTW	Type of WWTW	Resource Name (River, Dam, Other)	Current returns (22/23)		Current re-use (22/23)	
			Total Returns (Ml/a)	Portion (%) of total influent returned	Total Re-use (Ml/a)	Portion (%) of total influent reused
Kleinmond	Activated Sludge	Wetland to Sea	348.362*	60.00%	-	-
Hawston	Activated Sludge	Wetland	211.501	79.84%	-	-
Hermanus	Activated Sludge	Sea	2 049.495	69.53%	175.149	5.94%
Stanford	Activated Sludge	Tributary of the Klein River	265.003	69.66%	-	-
Gansbaai	Nereda System	Artificial Wetland	18.187	5.00%	341.021	93.75%

Notes: * Total returns were estimated

The current effluent re-use practices in Overstrand Municipality are as follows:

Table C.1.6: Current Effluent re-use Practices at the Various WWTWs

WWTWs	Current effluent re-used practices
Hermanus	Irrigation of the Hermanus golf course, sport field at the Hermanus High School, Hermanus Primary School, the cricket club, Mount Pleasant Primary School, Bowling Club, Curro School, Zwelihle School and the Schulphoek road reserve. Treated effluent is also used by Contractors.
Gansbaai	Irrigation of the public sport fields in Gansbaai, the sport fields at Gansbaai Primary School and the Gansbaai Academia and the bowling field in Franskraal.

The quantity of effluent treated by industrial consumers on their own premises and re-use by them is not known at this stage.

C.2. Water Services Delivery Profile

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

Table C.2.1: Norms and Standards for Levels of Water Supply Services

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

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

Table C.2.2: Norms and Standards for Levels of Sanitation Services

Hygiene promotion; Prevention of pollution; Re-use / recycle; Operation and Maintenance; Metering and tariffing; Solid Waste Management; Asset Management

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

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

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

C.2.1. User Connection Profile

The total number of user connections in each user sector, for the consumers provided with water services by Overstrand Municipality, is as follows:

Table C.2.1.1: User Connection Profile (Water Services)

WSDP Ref. #	Category of users	Water Services						
		Year 0 FY2022/23		Year - 1 FY2021/22		Year - 2 FY2020/21		New Connections Year 0 FY2022/23
		Nr	%	Nr	%	Nr	%	Nr
	RESIDENTIAL (DOMESTIC)							
3.3	Metered: Uncontrolled	38 851	72%	37 977	72%	37 103	84%	874
3.3	Metered: Controlled	0	0%	0	0%	0	0%	0
	Unmetered (flat rate)	0	0%	0	0%	0	0%	0
	Communal water supply	11 160	21%	11 209	21%	3 779	9%	-49
	Sub-Total: Residential	**50 011**	**93%**	**49 186**	**93%**	**40 882**	**93%**	**825**
	EDUCATION							
3.3	Schools	17	0%	17	0%	17	0%	0
	Tertiary educaton facilities	0	0%	0	0%	0	0%	0
	Sub-Total: Education	**17**	**0%**	**17**	**0%**	**17**	**0%**	**0**
	HEALTH							
3.3	Clinics	9	0%	10	0%	9	0%	-1
3.3	Hospitals	2	0%	2	0%	2	0%	0
3.3	Health Centres	1	0%	1	0%	1	0%	0
	Sub-Total: Health	**12**	**0%**	**13**	**0%**	**12**	**0%**	**-1**
	INSTITUTIONAL							
	Public Institutions (Incl. under "Other")	0	0%	0	0%	0	0%	0
3.3	Magistrate Offices	1	0%	1	0%	1	0%	0
3.3	Police Stations	5	0%	5	0%	5	0%	0
3.3	Prisons	0	0%	0	0%	0	0%	0
	etc	0	0%	0	0%	0	0%	0
	Sub-Total: Institutional	**6**	**0%**	**6**	**0%**	**6**	**0%**	**0**
	INDUSTRIAL							
3.3	Dry industries	45	0%	43	0%	39	0%	2
3.3	Wet industries	15	0%	15	0%	15	0%	0
	Sub-Total: Commercial	**60**	**0%**	**58**	**0%**	**54**	**0%**	**2**
	COMMERCIAL							
3.3	Businesses	2 488	5%	2 358	4%	2 227	5%	130
3.3	Office Buildings	0	0%	0	0%	0	0%	0
	Sub-Total: Commercial	**2 488**	**5%**	**2 358**	**4%**	**2 227**	**5%**	**130**
	MINING							
		0	0%	0	0%	0	0%	0
	Sub-Total: Commercial	**0**	**0%**	**0**	**0%**	**0**	**0%**	**0**
	OTHER							
	Agriculture: raw water	0	0%	0	0%	0	0%	0
	etc	1 035	2%	968	2%	905	2%	67
	Sub-Total: Other	**1 035**	**2%**	**968**	**2%**	**905**	**2%**	**67**
	TOTAL	**53 629**	**100%**	**52 606**	**100%**	**44 103**	**100%**	**1 023**

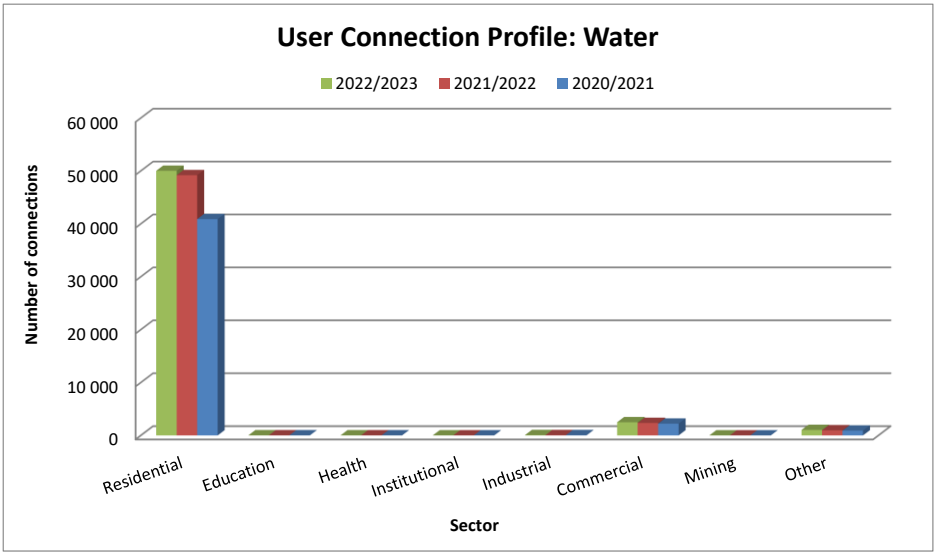


Figure C.2.1.1: User Connection Profile for Water

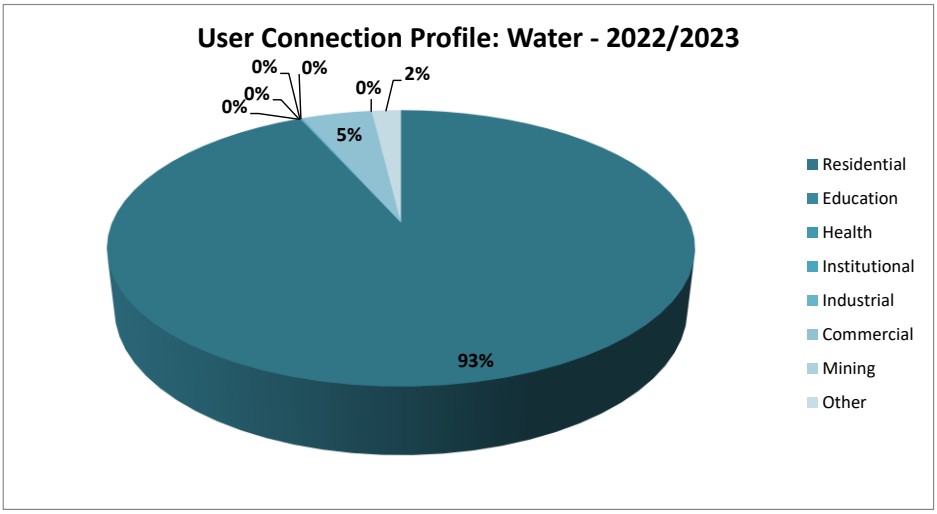


Figure C.2.1.2: User Connection Distribution for Water – Year 2022/2023

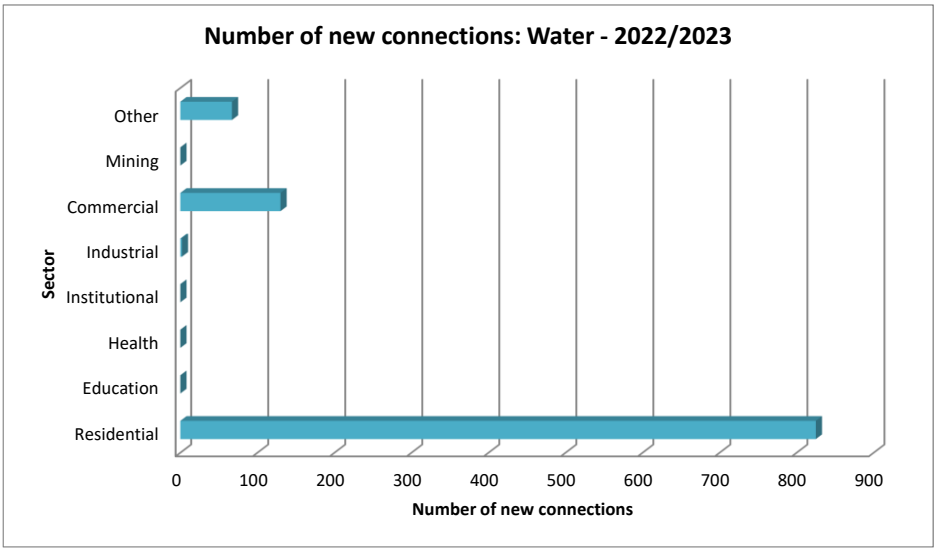


Figure C.2.1.3: Number of New Water Connections Provided during 2022/2023

Table C.2.1.2: User Connection Profile (Wastewater Services)								
WSDP Ref. #	Category of users	Wastewater Services						
		Year 0 FY2022/23		Year - 1 FY2021/22		Year - 2 FY2020/21		New Connections Year 0 FY2022/23
		Nr	%	Nr	%	Nr	%	Nr
	RESIDENTIAL (DOMESTIC)							
3.3	Metered: Uncontrolled	38 851	72%	37 977	72%	37 103	84%	874
3.3	Metered: Controlled	0	0%	0	0%	0	0%	0
	Unmetered (flat rate)	0	0%	0	0%	0	0%	0
	Communal water supply	11 160	21%	11 209	21%	3 779	9%	-49
	Sub-Total: Residential	**50 011**	**93%**	**49 186**	**93%**	**40 882**	**93%**	**825**
	EDUCATION							
3.3	Schools	17	0%	17	0%	17	0%	0
	Tertiary educaton facilities	0	0%	0	0%	0	0%	0
	Sub-Total: Education	**17**	**0%**	**17**	**0%**	**17**	**0%**	**0**
	HEALTH							
3.3	Clinics	9	0%	10	0%	9	0%	-1
3.3	Hospitals	2	0%	2	0%	2	0%	0
3.3	Health Centres	1	0%	1	0%	1	0%	0
	Sub-Total: Health	**12**	**0%**	**13**	**0%**	**12**	**0%**	**-1**
	INSTITUTIONAL							
	Public Institutions (Incl. under "Other")	0	0%	0	0%	0	0%	0
3.3	Magistrate Offices	1	0%	1	0%	1	0%	0
3.3	Police Stations	5	0%	5	0%	5	0%	0
3.3	Prisons	0	0%	0	0%	0	0%	0
	etc	0	0%	0	0%	0	0%	0
	Sub-Total: Institutional	**6**	**0%**	**6**	**0%**	**6**	**0%**	**0**
	INDUSTRIAL							
3.3	Dry industries	45	0%	43	0%	39	0%	2
3.3	Wet industries	15	0%	15	0%	15	0%	0
	Sub-Total: Commercial	**60**	**0%**	**58**	**0%**	**54**	**0%**	**2**
	COMMERCIAL							
3.3	Businesses	2 488	5%	2 358	4%	2 227	5%	130
3.3	Office Buildings	0	0%	0	0%	0	0%	0
	Sub-Total: Commercial	**2 488**	**5%**	**2 358**	**4%**	**2 227**	**5%**	**130**
	MINING							
		0	0%	0	0%	0	0%	0
	Sub-Total: Commercial	**0**	**0%**	**0**	**0%**	**0**	**0%**	**0**
	OTHER							
	Agriculture: raw water	0	0%	0	0%	0	0%	0
	etc	1 035	2%	968	2%	905	2%	67
	Sub-Total: Other	**1 035**	**2%**	**968**	**2%**	**905**	**2%**	**67**
	TOTAL	**53 629**	**100%**	**52 606**	**100%**	**44 103**	**100%**	**1 023**

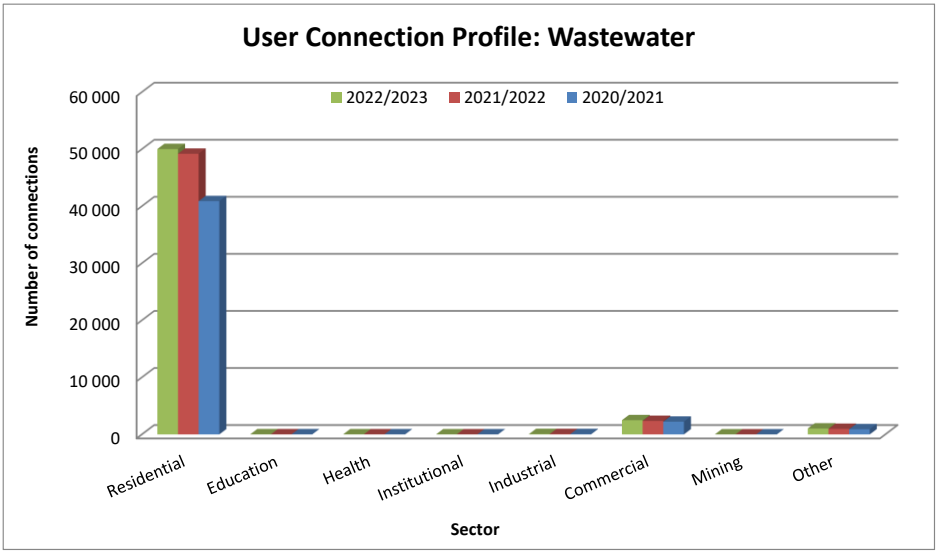


Figure C.2.1.4: User Connection Profile for Wastewater

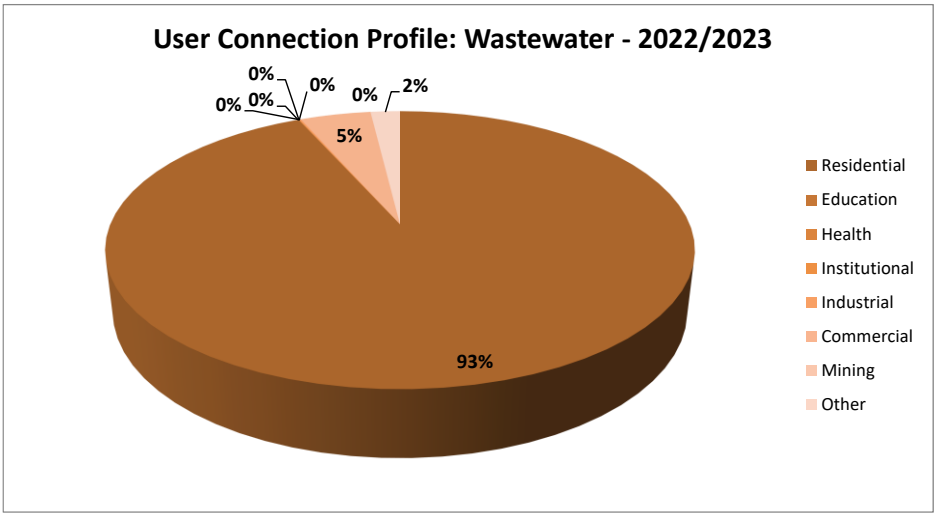


Figure C.2.1.5: User Connection Distribution for Wastewater – Year 2022/2023

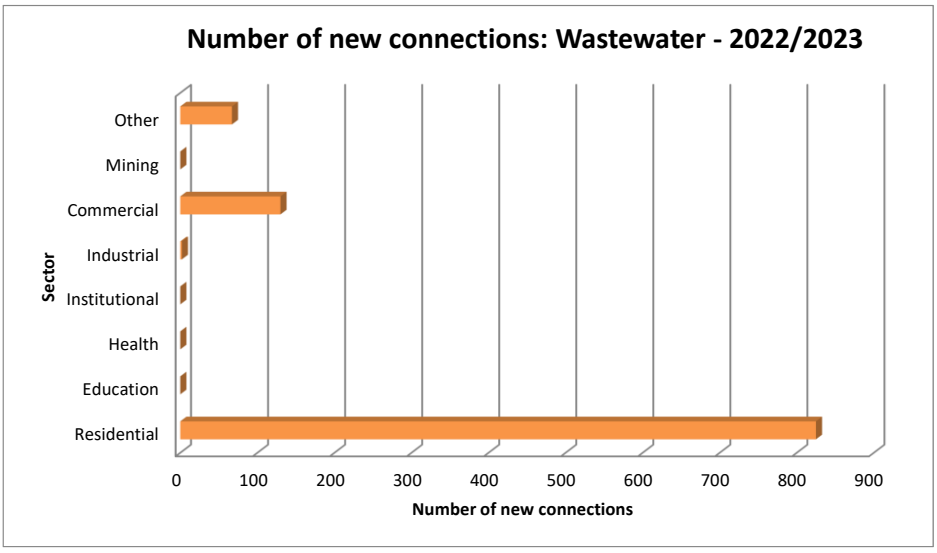


Figure C.2.1.6: Number of New Wastewater Connections Provided during 2022/2023

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

Table C.2.1.3: Number of Consumer Units in each User Sector for the Last Nine Financial Years					
Distribution System	**Residential**	**Commercial**	**Industrial**	**Other**	**Total**
2014/2015 (Average over period July 2014 – June 2015)					
Buffels River	3 264	106	0	36	**3 406**
Kleinmond	3 533	264	0	65	**3 862**
Greater Hermanus	18 168	904	31	325	**19 428**
Stanford	1 147	53	2	14	**1 216**
Greater Gansbaai	4 962	225	4	188	**5 378**
Pearly Beach	1 221	5	0	7	**1 234**
Baardskeerdersbos	63	0	0	3	**66**
Buffeljags Bay	30	0	0	4	**34**
TOTALS	**32 388**	**1 557**	**37**	**642**	**34 624**
2015/2016 (Average over period July 2015 – June 2016)					
Buffels River	3 316	110	0	31	**3 457**
Kleinmond	3 553	263	0	64	**3 880**
Greater Hermanus	18 305	999	32	308	**19 644**
Stanford	1 156	54	2	17	**1 229**
Greater Gansbaai	5 034	228	4	198	**5 464**
Pearly Beach	1 254	4	0	7	**1 265**
Baardskeerdersbos	64	0	0	3	**67**
Buffeljags Bay	30	0	0	6	**36**
TOTALS	**32 712**	**1 658**	**38**	**634**	**35 042**
2016/2017 (Average over period July 2016 – June 2017)					
Buffels River	3 362	118	0	30	**3 510**
Kleinmond	3 585	292	0	66	**3 943**
Greater Hermanus	18 788	1 004	37	346	**20 175**
Stanford	1 187	55	2	18	**1 262**
Greater Gansbaai	5 091	234	3	202	**5 530**
Pearly Beach	1 500	3	0	7	**1 510**
Baardskeerdersbos	64	0	0	3	**67**
Buffeljags Bay	30	0	0	6	**36**
TOTALS	**33 607**	**1 706**	**42**	**678**	**36 033**
2017/2018 (Average over period July 2017 – June 2018)					
Buffels River	3 416	118	0	30	3 564
Kleinmond	3 606	295	0	70	3 971
Greater Hermanus	19 460	1 039	38	499	21 036
Stanford	1 227	56	3	18	1 304
Greater Gansbaai	5 213	286	5	197	5 701
Pearly Beach	1 691	5	0	8	1 704
Baardskeerdersbos	64	0	0	3	67
Buffeljags Bay	30	0	0	6	36
TOTALS	**34 707**	**1 799**	**46**	**831**	**37 383**
2018/2019 (Average over period July 2018 – June 2019)					
Buffels River	3 501	119	0	30	3 650
Kleinmond	3 625	297	0	71	3 993
Greater Hermanus	19 819	1 161	38	532	21 550
Stanford	1 260	65	3	20	1 348
Greater Gansbaai	5 761	346	9	196	6 312
Pearly Beach	1 647	8	0	8	1 663
Baardskeerdersbos	64	1	0	3	68
Buffeljags Bay	30	0	0	6	36
TOTALS	**35 707**	**1 997**	**50**	**866**	**38 620**
2019/2020 (Average over period July 2019 – June 2020)					
Buffels River	3 558	119	0	30	3 707
Kleinmond	3 633	307	1	71	4 012

Table C.2.1.3: Number of Consumer Units in each User Sector for the Last Nine Financial Years					
Distribution System	**Residential**	**Commercial**	**Industrial**	**Other**	**Total**
Greater Hermanus	20 099	1 209	38	541	21 887
Stanford	1 269	76	3	18	1 366
Greater Gansbaai	5 917	375	9	198	6 499
Pearly Beach	1 657	9	0	8	1 674
Baardskeerdersbos	65	2	0	3	70
Buffeljags Bay	30	0	0	6	36
TOTALS	**36 228**	**2 097**	**51**	**875**	**39 251**
2020/2021 (Estimated)					
Buffels River	3 623	120	0	30	3 773
Kleinmond	3 649	312	1	73	4 035
Greater Hermanus	20 536	1 278	39	605	22 458
Stanford	1 295	84	3	18	1 400
Greater Gansbaai	6 194	421	11	196	6 822
Pearly Beach	1 710	11	0	8	1 729
Baardskeerdersbos	66	2	0	3	71
Buffeljags Bay	30	0	0	6	36
TOTALS	**37 103**	**2 227**	**54**	**940**	**40 324**
2021/2022 (Estimated)					
Buffels River	3 688	120	0	30	3 838
Kleinmond	3 665	317	2	74	4 058
Greater Hermanus	20 973	1 346	39	670	23 028
Stanford	1 322	91	4	18	1 435
Greater Gansbaai	6 469	468	13	195	7 145
Pearly Beach	1 763	13	0	8	1 784
Baardskeerdersbos	66	3	0	3	72
Buffeljags Bay	30	0	0	6	36
TOTALS	**37 976**	**2 358**	**58**	**1 004**	**41 396**
2022/2023 (Estimated)					
Buffels River	3 753	121	0	30	3 904
Kleinmond	3 681	322	2	76	4 081
Greater Hermanus	21 410	1 415	40	735	23 600
Stanford	1 349	98	4	19	1 470
Greater Gansbaai	6 745	515	15	193	7 468
Pearly Beach	1 815	15	0	9	1 839
Baardskeerdersbos	67	4	0	3	74
Buffeljags Bay	30	0	0	6	36
TOTALS	**38 850**	**2 490**	**61**	**1 071**	**42 472**

Table C.2.1.4: Total Number of Consumer Units per Town and Percentage Growth from 2014/2015 to 2022/2023										
Distribution System	**Annual Growth % 14/15 – 22/23**	**22/23**	**21/22**	**20/21**	**19/20**	**18/19**	**17/18**	**16/17**	**15/16**	**14/15**
Buffels River	1.72%	3 904	3 838	3 773	3 707	3 650	3 564	3 510	3 457	3 406
Kleinmond	0.69%	4 081	4 058	4 035	4 012	3 993	3 971	3 943	3 880	3 862
Greater Hermanus	2.46%	23 600	23 028	22 458	21 887	21 550	21 036	20 175	19 644	19 428
Stanford	2.40%	1 470	1 435	1 400	1 366	1 348	1 304	1 262	1 229	1 216
Greater Gansbaai	4.19%	7 468	7 145	6 822	6 499	6 312	5 701	5 530	5 464	5 378
Pearly Beach	5.11%	1 839	1 784	1 729	1 674	1 663	1 704	1 510	1 265	1 234
Baardskeerdersbos	1.44%	74	72	71	70	68	67	67	67	66
Buffeljags Bay	0.72%	36	36	36	36	36	36	36	36	34
TOTALS	**2.59%**	**42 472**	**41 396**	**40 324**	**39 251**	**38 620**	**37 383**	**36 033**	**35 042**	**34 624**

Note: The number of CUs for the last three financial years was estimated.

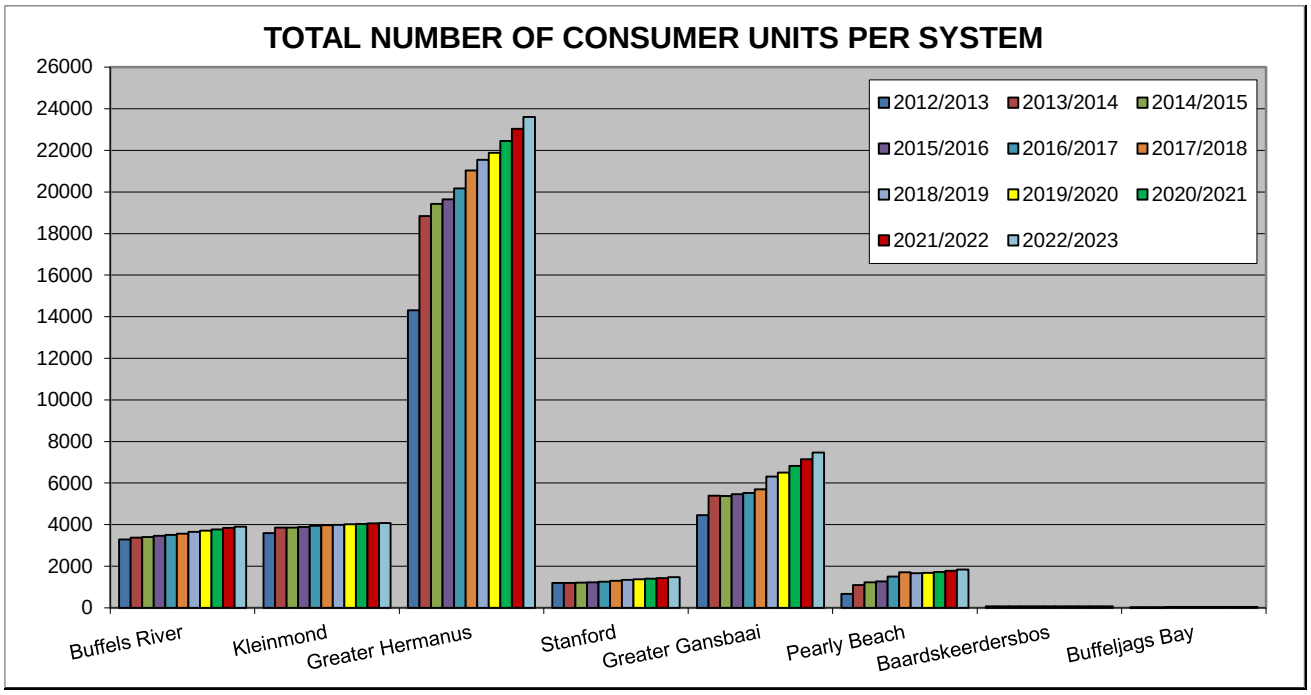


Figure C.2.1.7: Number of Billed Metered Consumers per System

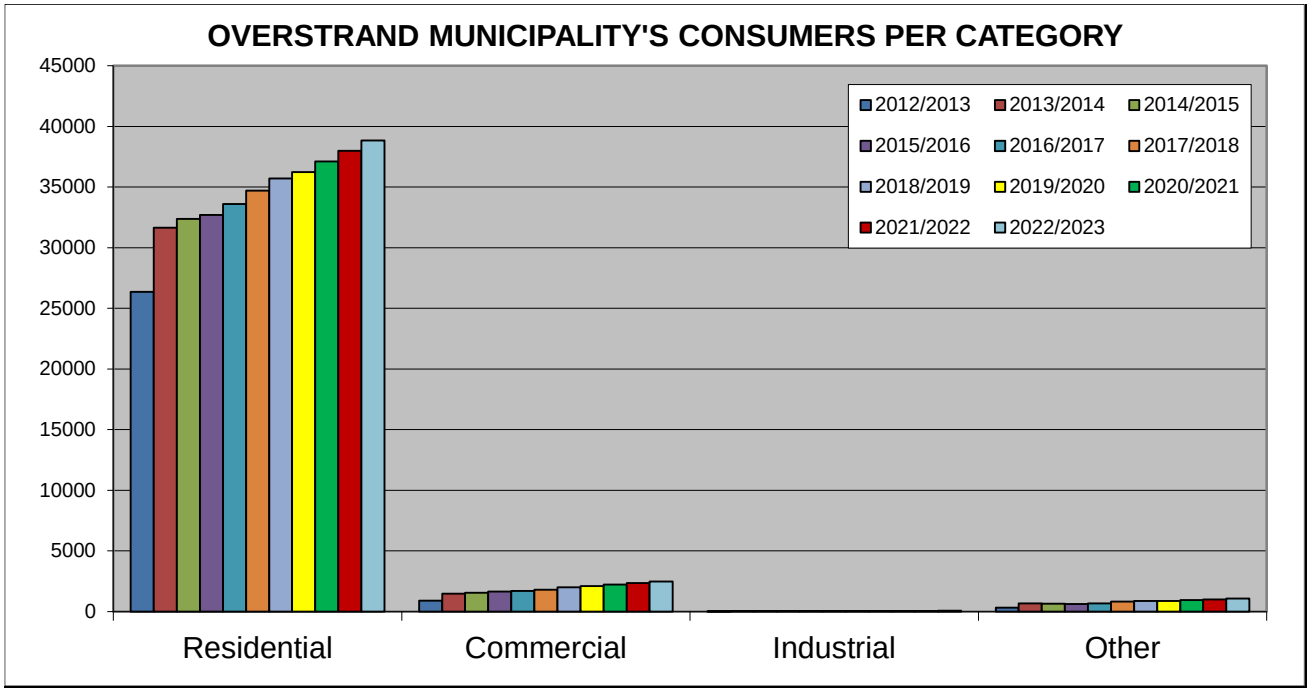


Figure C.2.1.8: Overstrand Municipality's Consumers per Category Type

All the formal households in the urban areas of Overstrand Municipality's Management Area are provided with water and sewer connections inside the premises. Informal areas are supplied with shared services as an intermediary measure. Overstrand Municipality works towards a ratio of at least one tap per twenty-five households and one communal toilet per five households for their shared services. Overstrand Municipality is committed to ensure that private landowners provide at least basic water and sanitation services to those households in the rural areas with existing services below RDP standard.

Overstrand Municipality's challenges with regard to the provision of basic water and sanitation services are as follows:

- To provide basic water and sanitation services in the informal areas to new citizens moving into the informal areas and to ensure that health and hygiene awareness and education is part of the process of providing basic services.
- To identify suitable land for the relocation of the people from informal areas, with existing communal services, to formal houses with a higher level of water and sanitation service (Services inside the erven).
- To identify adequate funding for the rehabilitation, maintenance, replacement and upgrading of the existing bulk and reticulation infrastructure in order to support the sustainability of the water and sanitation services.
- To monitor the provision of basic water and sanitation on privately owned land.

C.2.2. Residential Water Services Delivery Access Profile

The table below gives an overview of the water services delivery access profile of Overstrand Municipality.

Table C.2.2.1: Residential Water Services Delivery Access Profile: Water

Census Category	Description	Year 0 FY2022/23		Year -1 FY2021/22		Year 2 FY2020/21	
		Nr	%	Nr	%	Nr	%
	WATER (ABOVE MIN LEVEL)						
Piped (tap) water inside dwelling/institution	House connections	40 620	71%	39 713	70%	38 808	81%
Piped (tap) water inside yard	Yard connections	5 300	9%	5 300	9%	5 300	11%
Piped (tap) water on community stand: distance less than 200m from dwelling/institution	Standpipe connection < 200 m	11 191	20%	11 240	20%	3 810	8%
	Sub-Total: Minimum Serivce Level and Above	**57 111**	**100%**	**56 253**	**100%**	**47 918**	**100%**
	WATER (BELOW MIN LEVEL)						
Piped (tap) water on community stand: distance between 200m and 500m from dwelling/institution	Standpipe connection: > 200 m < 500 m	21	0%	21	0%	21	0%
Piped (tap) water on community stand: distance between 500m and 1000m (1km) from dwelling /institution	Standpipe connection: > 500 m < 1 000 m	8	0%	8	0%	8	0%
Piped (tap) water on community stand: distance greater than 1000m (1km) from dwelling/institution	Standpipe connection: > 1 000 m	5	0%	5	0%	5	0%
No access to piped (tap) water	No services	49	0%	49	0%	49	0%
	Sub-Total: Below Minimum Service Level	**83**	**0%**	**83**	**0%**	**83**	**0%**
	Total number of households	**57 194**	**100%**	**56 336**	**100%**	**48 001**	**100%**

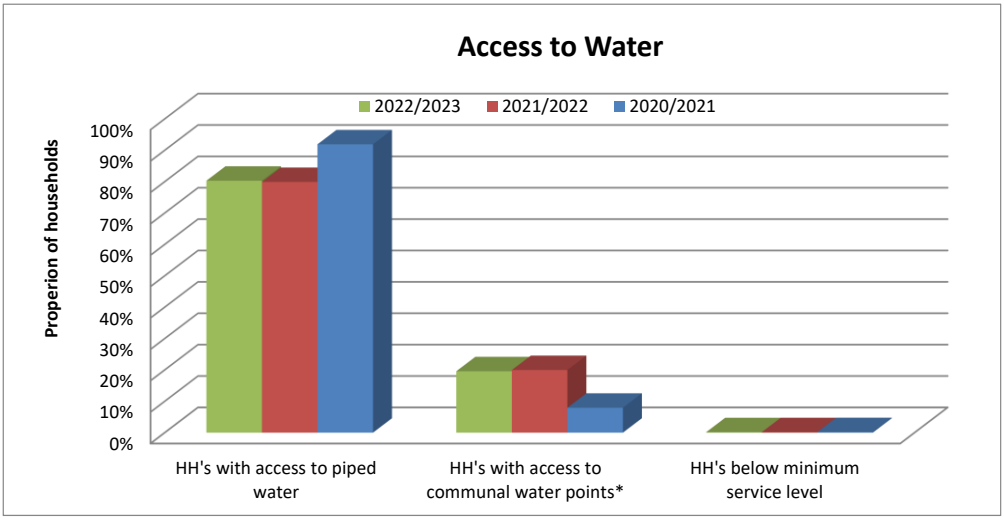


Figure C.2.2.1: Household Water Access Profile

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

Table C.2.2.2: Residential Water Service Levels (Residential Consumer Units)

Service Level	Buffels River	Kleinmond	Greater Hermanus	Stanford	Greater Gansbaai	Pearly Beach	Baardskeer-dersbos	Buffeljags Bay	Farms	Total
No Water Services	0	0	0	0	0	0	0	0	49 [2)]	49
Below RDP: Infrastructure Upgrade	0	0	0	0	0	0	0	0	0	0
Below RDP: Infrastructure Extension	0	0	0	0	0	0	0	0	34 [3)]	34
Below RDP: Infrastructure Refurbishment	0	0	0	0	0	0	0	0	0	0
Below RDP: O&M Needs	0	0	0	0	0	0	0	0	0	0
Below RDP: Water Resource Needs	0	0	0	0	0	0	0	0	0	0
Below RDP: Infrastructure and O&M Needs	0	0	0	0	0	0	0	0	0	0
Below RDP: Infrastructure, O&M and Water Resource Needs	0	0	0	0	0	0	0	0	0	0
Total Basic Need (RDP)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**83**	**83**
Below Housing Interim [4)]	0	0	0	0	0	0	0	0	0	0
Adequate Housing Permanent [5)]	0	1 014	7 897	447	1 661	126	0	15	0	11 160
Total Housing Need	**0**	**1 014**	**7 897**	**447**	**1 661**	**126**	**0**	**15**	**0**	**11 160**
Standpipes	0	0	0	0	0	0	0	0	31	31
Yard Connections [6)]	6	282	3 623	482	625	39	0	0	243	5 300
House Connections [1)]	3 753	3 681	21 410	1 349	6 745	1 815	67	30	1 770	40 620
Total Adequate	**3 759**	**3 963**	**25 033**	**1 831**	**7 370**	**1 854**	**67**	**30**	**2 044**	**45 951**
Total Residential Consumer Units for the Municipality	**3 759**	**4 977**	**32 930**	**2 278**	**9 031**	**1 980**	**67**	**45**	**2 127**	**57 194**

Notes: 1) Number of residential consumer units for the urban areas for 2022/2023 was estimated from the previous number of residential consumer units from the financial system.

2) Census 2011: Number of households with no access to piped (tap) water 49

3) Census 2011: Number of households with communal services (200m – 500m) 21, (500m – 1000m) 8 and (>1000m) 5.

4) Below Housing Interim in the above table is the number of informal households in informal areas without basic water services.

5) Adequate Housing Permanent in the above table is the number of informal households in informal areas with communal water services, as confirmed by the Municipality (June 2023).

6) Estimated number of backyard dwellers, as agreed with the Municipality during January 2014, as part of DWS's Backlog Eradication Strategy process.

The table below gives an overview of the sanitation services delivery access profile of Overstrand Municipality.

Table C.2.2.3: Residential Water Services Delivery Access Profile: Sanitation

Census Category	Description	Year 0		Year -1		Year 2	
		FY2022/23		FY2021/22		FY2020/21	
		Nr	%	Nr	%	Nr	%
	SANITATION (ABOVE MIN LEVEL)						
Flush toilet (connected to sewerage system)	Waterborne	30 398	53%	29 502	52%	28 376	59%
	Waterborne: Low Flush	4 100	7%	4 100	7%	4 100	9%
Flush toilet (with septic tank)	Septic tanks / Conservancy	11 239	20%	11 228	20%	11 449	24%
Chemical toilet	Non-waterborne (min. service level)	5	0%	5	0%	5	0%
Pit toilet with ventilation (VIP)		27	0%	27	0%	27	0%
Other / Communal Services	Waterborne (min. service level, communal)	11 160	20%	11 209	20%	3 779	8%
	Sub-Total: Minimum Serivce Level and Above	**56 929**	**100%**	**56 071**	**100%**	**47 736**	**99%**
	SANITATION (BELOW MIN LEVEL)						
Pit toilet without ventilation	Pit toilet	12	0%	12	0%	12	0%
Bucket toilet	Bucket toilet	68	0%	68	0%	68	0%
Other toilet provision (below min. service level	Other	119	0%	119	0%	119	0%
No toilet provisions	No services	66	0%	66	0%	66	0%
	Sub-Total: Below Minimum Service Level	**265**	**0%**	**265**	**0%**	**265**	**1%**
	Total number of households	**57 194**	**100%**	**56 336**	**100%**	**48 001**	**100%**

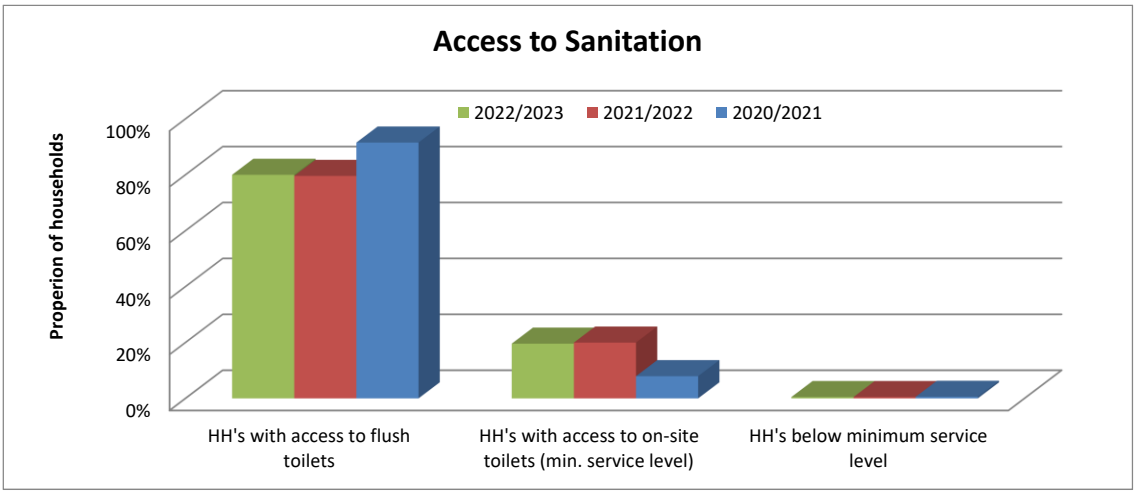


Figure C.2.2.2: Household Sanitation Access Profile

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

Table C.2.2.4: Residential Sanitation Service Levels (Residential Consumer Units)

Service Levels	Buffels River	Kleinmond	Greater Hermanus	Stanford	Greater Gansbaai	Pearly Beach	Baardskeer-dersbos	Buffeljags Bay	Farms	Total
No Sanitation Services	0	0	0	0	0	0	0	0	66 [3]	66
Below RDP: Infrastructure Upgrade	0	0	0	0	0	0	0	0	204 [4]	204
Below RDP: Infrastructure Extension	0	0	0	0	0	0	0	0	0	0
Below RDP: Infrastructure Refurbishment	0	0	0	0	0	0	0	0	0	0
Below RDP: O&M Needs	0	0	0	0	0	0	0	0	0	0
Below RDP: Water Resource Needs	0	0	0	0	0	0	0	0	0	0
Below RDP: Infrastructure and O&M Needs	0	0	0	0	0	0	0	0	0	0
Below RDP: Infrastructure, O&M and Water Resource Needs	0	0	0	0	0	0	0	0	0	0
Total Basic Need (RDP)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**270**	**270**
Below Housing Interim [5]	0	0	0	0	0	0	0	0	0	0
Adequate Housing Permanent [6]	0	1 014	7 897	447	1 661	126	0	15	0	11 160
Total Housing Need	**0**	**1 014**	**7 897**	**447**	**1 661**	**126**	**0**	**15**	**0**	**11 160**
No Waterborne (VIP)	0	0	0	0	0	0	0	0	27	27
Waterborne Low Flush	0	0	4 100	0	0	0	0	0	0	4 100
Septic Tanks / Conservancy Tanks	3 759	960	1 318	10	2 671	594	67	30	1 830	11 239
Waterborne	0	3 003	19 615	1 821	4 699	1 260	0	0	0	30 398
Total Adequate [2]	**3 759**	**3 963**	**25 033**	**1 831**	**7 370**	**1 854**	**67**	**30**	**1 857**	**45 764**
Total Residential Consumer Units for the Municipality	**3 759**	**4 977**	**32 930**	**2 278**	**9 031**	**1 980**	**67**	**45**	**2 127**	**57 194**

Notes: 1) Total for Septic Tanks and Conservancy tanks in Urban Areas was estimated from previous Municipal information for June for "Developed Sites Septic Tanks (SE8D)"

2) Include Backyard dwellers

3) Census 2011: Number of households with no toilet facility 66.

4) Census 2011: Number of households with existing buckets 68, chemical toilets 5, pit toilets without ventilation 12 and "other" 119.

5) Below Housing Interim in the above table is the number of informal households in informal areas without basic sanitation services.

6) Adequate Housing Permanent in the above table is the number of informal households in informal areas with communal ablution facilities, as confirmed by the Municipality (June 2023).

Number of households provided with water through communal water services:

The National Norms and Standards for Domestic Water and Sanitation Services, as published in the Government Gazette No.41100 of 8 September 2017, include the following interim water and sanitation services:

Table C.2.2.5: Interim Water and Sanitation Services (National Norms and Standards for Domestic Water and Sanitation Services)
Intermittent provision of water at a minimum level of water supply services
• A minimum volume of 1 500 litres of potable water shall be made available to a household per week. • The water provided shall comply with the SANS241 quality standards. • The access/delivery point shall be at a minimum a communal standpipe, or a storage facility in the yard (water container, yard tank, roof tank) of at least a volume of 1 500 litres. • In the case of a communal standpipe, it shall be within a reasonable walking distance of no more than 100m from the farthest household. • In the case of a storage facility in the yard (water container, yard tank, roof tank), it shall be refilled by a water tanker with potable water at least once a week. • The water shall be made available for 52 weeks per year. • All water use and/or supply shall be metered, but not tariffed. • Maintenance of the infrastructure for this level of service is the responsibility of the WSA. • Point-of-use water treatment systems and methods shall be advocated. • Efforts shall be made to ensure user acceptance and understanding for this level of service. • Users shall be educated in effective water use and hygiene. • This level of service shall be phased out by 2030 to comply with the National Development Plan's requirement of providing a basic service of at least a yard connection for water.
Interim sanitation services (Communal and shared facilities)

• Users shall be consulted on the siting and design, and the responsible cleaning and maintenance of shared toilets. Clean toilets are more likely to be frequently used.
• Plumbing in and for communal and shared facilities needs to be more robust than that installed on private premises and shall comply with the general principles of the National Building Regulations. Precautions need to be taken in the design against vandalism, theft and misuse.
• Efforts shall be made to provide people living with chronic illnesses, such as HIV and AIDS, with easy access to a toilet as they frequently suffer from chronic diarrhoea and reduced mobility.
• Where possible, communal and shared toilets must be provided with lighting, or users provided with torches. The input of the users must be sought with regard to ways of enhancing the safety of users.
• Efforts to build a sense of communal ownership and pride of possession shall be made so that cooperation is voluntarily given or assured by peer pressure.
• Sufficient sanitation facilities shall be provided for the number of users
  ➢ Communal toilet: Toilet seats – 1 seat per 50 users; Urinal units – 1 unit per 100 users; Hand washing – 1 basin per 10 toilet seats.
  ➢ Shared toilet mostly used all the time: Toilet seats – 1 seat per 20 users; Urinal units – 1 unit per 50 users; Hand washing – 1 basin per 4 toilet seats.
• Shared and communal facilities shall have separate toilet blocks for men and women with separate entries; waste bins with lids in toilet block for women – emptied once a week and disposed of appropriately; urinal facilities for men; seats for children in the section for women; waiting / circulating area; separate washing cubicles for men and women; facility to store large volumes of water (water-borne sanitation); appropriate wastewater disposal system; and store room for keeping the cleaning material / equipment.

Overstrand Municipality's Directorate Community Services regularly count the number of households in the informal areas. The current number of households in the informal areas, with access to communal basic services, is 3 242. The number of households with communal services in the informal areas and the number of households per facility type are summarised in the table below (June 2023).

Table C.2.2.6: Communal Service Levels in the Informal Areas

Area	Informal Settlement	No. of Households	Number of Toilets	Household / Toilet	Number of Taps	Households / Tap
Stanford	Die Kop	180	20	9.0	7	25.7
Kleinmond	Overhills	489	107	4.6	27	18.1
Gansbaai	Mashakhane	716	451	1.6	283	2.5
	Buffeljags Bay	15	8	1.9	2	7.5
Hawston	Erf 170	8	4	2.0	2	4.0
Zwelihle	Tsepe-Tsepe	244	40	6.1	7	34.9
	Serviced Sites	85	25	3.4	5	17.0
	Thambo Square	345	21	16.4	7	49.3
	Asazani	89	12	7.4	5	17.8
	Temporary Relocation Area	250	125	2.0	125	2.0
	New Camp	69	12	5.8	8	8.6
	Transit Camp	171	140	1.2	136	1.3
Sub-Total		**2 661**	**965**	**2.8**	**614**	**4.3**
Communal Service Levels – Emergency Housing						
Stanford	Stanford EHP	154	36	4.3	9	17.1
Hermanus	Mount Pleasant EHP (Haven)	25	8	3.1	4	6.3
	Mount Pleasant EHP (Dankbaar)	29	10	2.9	4	7.3
	Zwelihle EHP	150	42	3.6	13	11.5
Gansbaai	Masakhane EHP	97	16	6.1	3	32.3
	Eluxolweni EHP	126	30	4.2	11	11.5
Sub-Total		**581**	**142**	**4.1**	**44**	**13.2**
Total		**3 242**	**1 107**	**2.9**	**658**	**4.9**

Notes: No Services, Ratios above Targets, Ratios meeting Targets

Targets: Overstrand Municipality works towards a ratio of at least 1 tap per twenty-five households and 1 communal toilet per five households for their shared services.

The table below indicates the number of communal services provided on erven that was part of the land invasion.

Table C.2.2.7: Communal Service Levels Provided During Land Invasion

Area	Settlement	No. of Households	Number of Toilets	Number of Taps
Hermanus	Marikana (Area of church)	2 309	14	10
	Marikana (Next to swimming pool)		20	16
	Marikana (Next to recycling site)		20	14
	Marikana Swimming Pool		20	12
	Marikana (Next to parking area)		10	8
	Dubai (Schulphoek)	3 950	30	21
	Back of sportground, Zwelihle	173	20	8
Kleinmond	Overhills	525	19	6
Gansbaai	Masakhane (Next to primary school and portion of new housing project)	848	8	1
Stanford	Die Kop	88	8	2
	Thembelihle	25	2	1
Sub-Total		**7 918**	**171**	**99**

All schools and medical facilities in Overstrand Municipality's Management Area are supplied with a higher level of water and sanitation services. The existing water and sanitation service levels for all the schools in Overstrand Municipality's Management Area is summarised in the table below.

Table C.2.2.8: Service Levels at Schools

Associated Services Facility	Number of Facilities	Water			Sanitation		
		Facilities with Adequate Services	Facilities with no Services	Facilities with inadequate Services	Facilities with Adequate Services	Facilities with no Services	Facilities with inadequate Services
Schools	17	17	0	0	17	0	0

Source: Number of public schools – 2022 Socio Economic Profile of Overstrand Municipality, Western Cape Government

The existing water and sanitation service levels for all the Medical Facilities in Overstrand Municipality's Management Area is summarised in the table below.

Table C.2.2.9: Service Levels at Medical Facilities

Associated Services Facility	Number of Facilities	Water			Sanitation		
		Facilities with Adequate Services	Facilities with no Services	Facilities with inadequate Services	Facilities with Adequate Services	Facilities with no Services	Facilities with inadequate Services
Hospitals	2	2	0	0	2	0	0
Community Day Centres	1	1	0	0	1	0	0
Clinics	4	4	0	0	4	0	0
Satellite Clinics	5	5	0	0	5	0	0

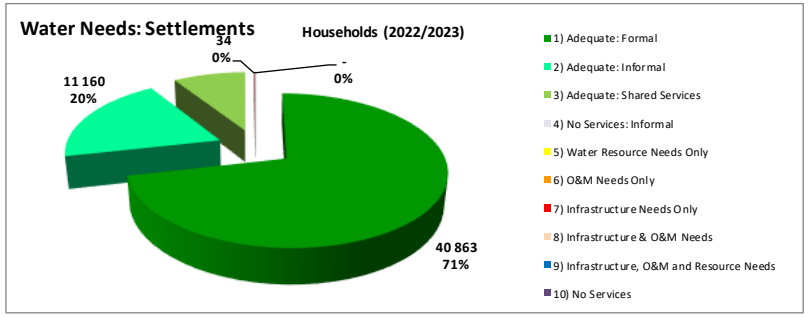
Source: Number of facilities - 2022 Socio Economic Profile of Overstrand Municipality, Western Cape Government

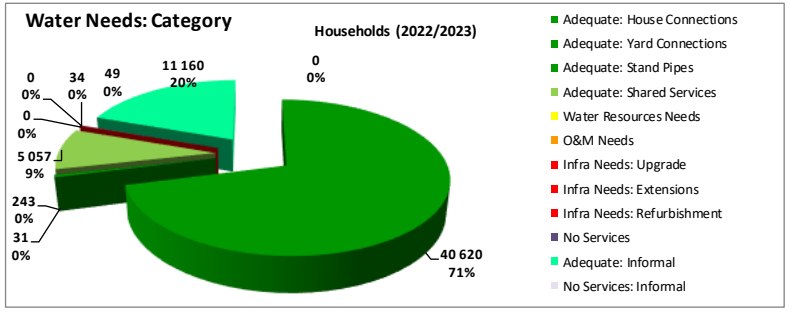
C.2.3. Residential Water Services Delivery Adequacy Profile

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

Table C.2.3.1: Residential Water Services Delivery Adequacy Profile (Water)

Water Categorisation	Number of settlements	FORMAL																				INFORMAL			
		Adequate								Water Resource needs		O & M Needs		Infrastructure Needs						No services		Adequate		No services	
		House Connections		Yard Connections		Stand Pipes		Shared Services						Upgrades		Extensions		Refurbishment							
		HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%
1	9	40 620	100%	243	100%																				
2	5																					11 160	100%		
3	7					31	100%	5 057	100%																
4	0																								
5	0																								
6	0																								
7	1															34	100%								
8	0																								
9	0																								
10	1																			49	100%				
Total Household Interventions required		40 620		243		31		5 057		0		0		0		34		0		49		11 160		0	



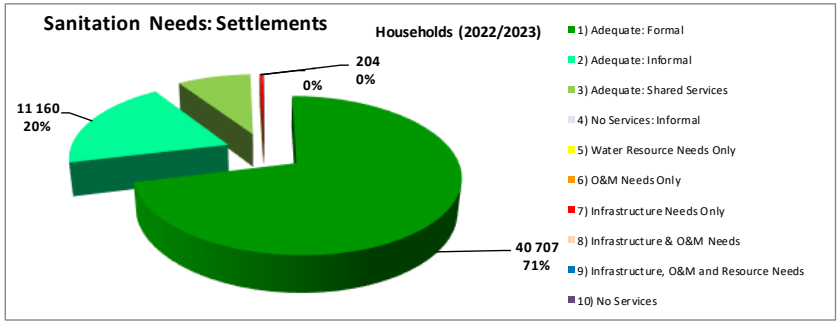


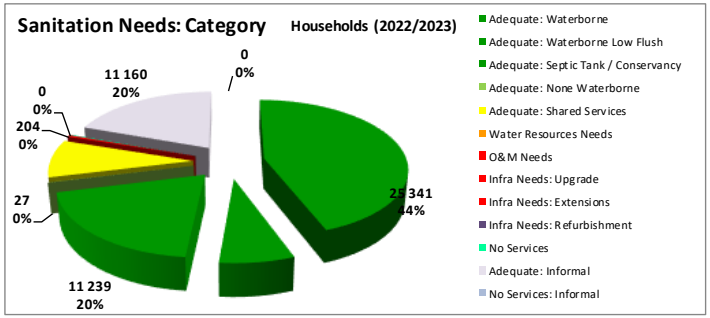
1	Adequate	3	Adequate: Shared services	5	Water Resources Needs **Only**	7	Infrastructure Needs **Only**	9	Infrastructure, O&M & Resource Needs
2	Adequate: Informal	4	No Services: Formal	6	O & M Needs **Only**	8	Infrastructure& O&M needs	10	No Services

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

Table C.2.3.2: Residential Water Services Delivery Adequacy Profile (Sanitation)

Water Categorisation	Number of settlements	FORMAL																				INFORMAL			
		Adequate										Water Resource needs		O & M Needs		Infrastructure Needs						No services		Adequate		No services	
		Waterborne		Waterborne Low flush		Septic Tank/ Conservancy		None Waterborne		Shared Services						Upgrades		Extensions		Refurbishmen							
		HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%
1	9	25 341	100%	4 100	100%	11 239	100%	27	100%																		
2	5																							11 160	100%		
3	7									5 057	100%																
4	0																										
5	0																										
6	0																										
7	1															204	100%										
8	0																										
9	0																										
10	1																					66	100%				
Total Household Interventions required		25 341		4 100		11 239		27		5 057		0		0		204		0		0		66		11 160		0	





1	Adequate	3	Adequate: Shared services	5	Water Resources Needs **Only**	7	Infrastructure Needs **Only**	9	Infrastructure, O&M & Resource Needs
2	Adequate: Informal	4	No Services: Formal	6	O & M Needs **Only**	8	Infrastructure& O&M needs	10	No Services

C.3. Cost Recovery and Free Basic Services

C.3.1. Tariffs

The water tariff structures for Overstrand Municipality for the 2022/2023 financial year and the previous three financial years are summarised in the table below (Subject to 15% VAT).

Table C.3.1.1: Water Tariffs

Consumer / Description	Tariff Code	Category		22/23	21/22	20/21	19/20
Consumer Deposits	WD1	Domestic Water		R678-00	R646-00	R620-76	R594-03
	WD2	Commercial Water Cons. < 40 kl		R2 709-00	R2 582-00	R2 483-07	R2 376-14
	WD3	Commercial Water Cons 40 – 100 kl		R9 479-00	R9 036-00	R8 688-51	R8 314-36
	WD4	Commercial Water Cons. 100 kl +		R16 249-00	R15 490-00	R14 893-96	R14 252-59
	WD5	Domestic – Water RUEs		Applicable RUE's x WD1A			
	WD6	Indigent Registered		R217-00	R207-00	R198-82	R190-26
Basic Charge	W1A1	Basic Monthly Charge per erf/unit per month		R155-62	R148-35	R142-64	R136-50
	W1A2A	Basic Monthly Subsidy: Residential Indigent as per paragraph A of the Indigent Policy per erf/unit per month		R155-62	R148-35	R142-64	R136-50
	W1A2B	Basic Monthly Subsidy: Residential Indigent as per paragraph B, C & D of the Indigent Policy per erf/unit per month 1/7/22-31/10/22		R129-14	R129-14	R129-14	R129-14
	W1A2B	Basic Monthly Subsidy: Residential Indigent as per paragraph B, C & D of the Indigent Policy per erf/unit per month 1/11/22-28/2/23		R86-09	-	-	-
	W1A2B	Basic Monthly Subsidy: Residential Indigent as per paragraph B, C & D of the Indigent Policy per erf/unit per month 1/3/23-30/6/23		R43-05	-	-	-
	W1A3A	Fixed Infrastructure Basic Charge per erf/unit per month		R15-45	R15-45	R15-45	R15-45
	W1A3B	Fixed Infrastructure Basic Charge per erf/unit per month		R8-41	R8-41	R8-41	R8-41
	W1A3C	Subsidised Fixed Infrastructure Basic Charge per erf/unit per month – Registered Indigent Households		R8-41	R8-41	R8-41	R8-41
Consumption Households and Registered Indigent Households (0 - 10 kl subsidised for indigent households)	W1B1	Normal Tariff & Level 1 restrictions	0 – 6 kl per kl	R6-38	R6-08	R5-85	R5-60
	W1B2		7 - 18 kl per kl	R13-08	R12-47	R11-99	R11-47
	W1B3		19 – 30 kl per kl	R21-22	R20-23	R19-45	R18-61
	W1B4		31 – 45 kl per kl	R32-68	R31-15	R29-95	R28-66
	W1B5		46 - 60 kl per kl	R42-43	R40-45	R38-89	R37-22
	W1B6		> 60 kl per kl	R56-58	R53-94	R51-87	R49-64
	W1B7	Restriction Tariff 1 (level 2 & 3 restrictions)	0 – 6 kl per kl	R6-38	R6-08	R5-85	R5-60
	W1B8		7 – 18 kl per kl	R17-01	R16-20	R15-58	R14-91
	W1B9		19 - 30 kl per kl	R27-59	R26-29	R25-28	R24-19
	W1B10		31 - 45 kl per kl	R42-48	R40-49	R38-93	R37-25
	W1B11		46 - 60 kl per kl	R55-16	R55-57	R53-43	R51-13
	W1B12		> 60 kl	R73-56	R74-10	R71-25	R68-18
	W1B13	Restriction Tariff 2 (level 4 & 5 restrictions)	0 – 6 kl per kl	R6-38	R6-08	R5-85	R5-60
	W1B14		7 – 18 kl per	R20-93	R19-97	R19-20	R18-37
	W1B15		19 - 30 kl per kl	R33-95	R32-38	R31-13	R29-79
	W1B16		31 - 45 kl per kl	R52-28	R49-83	R47-91	R45-85
	W1B17		46 - 60 kl per kl	R67-89	R68-40	R65-77	R62-94
	W1B18		> 60 kl	R90-53	R91-19	R87-68	R83-90
	W1B19	Restriction Tariff 3 (level 6 restrictions)	0 – 6 kl per kl	R6-38	R6-08	R5-85	R5-60
	W1B20		7 – 18 kl per kl	R26-16	R26-35	R25-34	R24-25
	W1B21		19 – 30 kl per kl	R42-44	R113-99	R109-61	R104-89
	W1B22		31 – 45 kl per kl	R65-35			
	W1B23		46 – 60 kl per kl	R84-86			
	W1B24		> 60 kl per kl	R113-17			

Table C.3.1.1: Water Tariffs							
Consumer / Description	**Tariff Code**	**Category**		**22/23**	**21/22**	**20/21**	**19/20**
Consumption – All other	W1C1	Normal Tariff & Level 1 restrictions	0 – 18 kl per kl	R14-47	R13-79	R13-26	R12-69
	W1C2		19 - 30 kl per kl	R21-22	R20-23	R19-45	R18-61
	W1C3		31 – 45 kl per kl	R32-68	R31-15	R29-95	R28-66
	W1C4		46 – 60 kl per kl	R42-43	R40-45	R38-89	R37-22
	W1C5		> 60 kl per kl	R56-58	R53-94	R51-87	R49-64
	W1C6	Restriction Tariff 1 (level 2 & 3 restrictions)	0 – 18 kl per kl	R18-81	R17-93	R17-24	R16-50
	W1C7		19 – 30 kl per kl	R27-59	R26-29	R25-28	R24-19
	W1C8		31 - 45 kl per kl	R42-48	R40-49	R38-93	R37-25
	W1C9		46 - 60 kl per kl	R55-16	R55-58	R53-44	R51-14
	W1C10		> 60 kl	R73-56	R74-09	R71-24	R68-17
	W1C11	Restriction Tariff 2 (level 4 & 5 restrictions)	0 – 18 kl per kl	R23-15	R22-08	R21-23	R20-32
	W1C12		19 - 30 kl per kl	R33-95	R32-38	R31-13	R29-79
	W1C13		31 - 45 kl per kl	R52-28	R49-83	R47-91	R45-85
	W1C14		46 - 60 kl per kl	R67-89	R68-40	R65-77	R62-94
	W1C15		> 60 kl	R90-53	R91-19	R87-68	R83-90
	W1C16	Restriction Tariff 3 (level 6 restrictions)	0 – 10 kl per kl	-	R27-59	R26-53	R25-39
			0 – 18 kl per kl	R28-93	-	-	-
			19 – 30 kl per kl	R42-44	-	-	-
			31 - 45 kl per kl	R65-35	-	-	-
			46 - 60 kl per kl	R84-86	-	-	-
	W1C17		> 10 kl per kl	-	R113-99	R109-61	R104-89
			> 60 kl	R113-17	-	-	-
Other Consumers	W1D1	Departmental per kl		R28-46	R25-19	R24-86	R23-39
	W1D2	Fire Hoses: Basic per month		R198-04	R188-79	R181-53	R173-71
	W1D3	Bulk usage (Unconnected to networks) per kl – Consumers permanently residing within Overstrand municipal area		R16-02	R15-27	R14-68	R14-05
	W1D3A	Restriction Tariff 1 (level 2 & 3 water restrictions)		R20-82	R19-85	R19-09	R18-27
	W1D3B	Restriction Tariff 2 (level 4 & 5 water restrictions)		R25-63	R24-21	R23-28	R22-28
	W1D3C	Restriction Tariff 3 (level 6 water restrictions)		R32-04	R30-53	R29-36	R28-10
	W1D4	Kidbrooke (Van Cauter 0 – 8000 kl /a)		R0-08	R0-08	R0-08	R0-08
	W1D5	Onrus Small Holdings Tariff 2 (Van Cauter)		R0-08	R0-08	R0-08	R0-08
	W1D6	Onrus Small Holdings Tariff 4 (Per Agreement)		R1-11	R1-11	R1-11	R1-11
	W1D7	Contractors water consumption – temporary connection		R28-46	R25-19	R24-86	R23-39
	W1D8	Bulk usage (Unconnected to networks) per Kl - People residing outside the Overstrand municipal area		R59-40	R56-63	R54-45	R52-11
	W1D8A	Restriction Tariff 1 (level 2 & 3 restrictions)		R77-23	R73-62	R70-79	R67-74
	W1D8B	Restriction Tariff 2 (level 4 & 5 restrictions)		R95-05	R90-62	R87-13	R83-38
	W1D8C	Restriction Tariff 3 (level 6 restrictions)		R118-81	R113-27	R108-91	R104-22
Wet Commercial, Sport, Parks etc. (must apply for this tariff)	W1E1	Normal Tariff & Level 1 restrictions	0 – 500 kl per kl	R21-05	R20-07	R19-30	R18-47
	W1E2		501 – 1 000 kl per kl	R31-84	R30-35	R29-18	R27-92
	W1E3		> 1 000 kl per kl	R42-45	R40-47	R38-91	R37-23
	W1E4	Restriction Tariff 1 (level 2 & 3 restrictions)	0 – 300 kl per kl	R27-37	R26-10	R25-10	R24-02
	W1E5		301 – 700 kl per kl	R41-39	R39-44	R37-92	R36-29
	W1E6		> 700 kl per kl	R55-19	R52-60	R50-58	R48-40
	W1E7	Restriction Tariff 2 (level 4 & 5 restrictions)	0 – 250 kl per kl	R33-69	R32-12	R30-88	R29-55
	W1E8		251 – 500 kl per kl	R50-94	R48-55	R46-68	R44-67
	W1E9		> 500 kl per kl	R67-92	R64-73	R62-24	R59-56
	W1E10	Restriction Tariff	0 – 100 kl per kl	R42-11	R40-14	R38-60	R36-94

Table C.3.1.1: Water Tariffs							
Consumer / Description	**Tariff Code**	**Category**		**22/23**	**21/22**	**20/21**	**19/20**
	W1E11	3 (level 6 restrictions)	>100 kl per kl	R84-91	R80-92	R77-81	R74-46
Wet Industry (Marine etc, must apply for this tariff) (Average of 100kl per day over prev. 365 days)	W1F1	Normal Tariff & Level 1 restrictions	0 – 5 800 kl per kl	R21-93	R20-91	R20-11	R19-24
	W1F2		> 5 800 kl per kl	R42-45	R40-47	R38-91	R37-23
	W1F3	Restriction Tariff 1 (level 2 & 3 restrictions)	0 – 5 800 kl per kl	R28-51	R27-19	R26-14	R25-01
	W1F4		> 5 800 kl per kl	R55-19	R52-60	R50-58	R48-40
	W1F5	Restriction Tariff 2 (level 4 & 5 restrictions)	0 – 5 800 kl per kl	R35-10	R33-46	R32-17	R30-78
	W1F6		> 5 800 kl per kl	R67-92	R64-73	R62-24	R59-56
	W1F7	Restriction Tariff 3 (level 6 restrictions	0 – 5 800 kl per kl	R43-87	R41-81	R40-20	R38-47
	W1F8		> 5 800 kl per kl	R84-91	R80-92	R77-81	R74-46
Availability Charges	W2A1	Overstrand per month		R155-62	R148-35	R142-64	R136-50
	W2A2	Farms connected to water pipeline		R155-62	R148-35	R142-64	R136-50
Rebates (Granted by Municipal Manager after application)	W2J1	Kl above average – per kl		R28-46	R25-19	R24-86	R23-39
Irrigation Water (Leiwater) and Raw Water	W3A1	Use and pump water (80-90min) per month Stanford		R47-56	R45-34	R43-60	R41-72
	W3A2	Pearly Beach Small Holdings: Basic		R58-04	R55-33	R53-20	R50-91
	W3A3	Pearly Beach Small Holdings: Consumption 0 – 70 kl per kl		R4-52	R4-33	R4-16	R3-98
	W3A4	Pearly Beach Small Holdings: Consumption > 70 kl per kl		R10-63	R10-13	R9-74	R9-32
	W3A5	Others per kl		R4-52	R4-33	R4-16	R3-98
	W3A6	Farm 1/722 Stanford as per agreement 0.875% of raw water abstraction from municipal boreholes, max 4380 kl/a, per kl		R0-00	R0-00	R0-00	R0-00
	W3A6A	Farm 10/722 Stanford as per agreement 0.875% of raw water abstraction from municipal boreholes, max 4380 kl/a, per kl		R0-00	R0-00	R0-00	R0-00
	W3A6B	Farms Rem 1/722 and 10/722 Stanford as per agreement, raw water abstraction from boreholes in excess of 0.875% of municipal abstraction per property, per kl		R4-52	R0-00	R0-00	R0-00
	W3A7	Farm 586 Volmoed raw water from De Bos pipeline consumption 0-300 kl/month per kl		R0-00	R0-00	R0-00	R0-00
	W3A8	Farm 586 Volmoed raw water from De Bos pipeline consumption >300 kl/month per kl		R4-52	R4-31	R3-92	R3-75
Irrigation Water (Treated Effluent)	W3B2	Hermanus Golf Club per month		R51 630-30	R49 218-59	R47 325-57	R45 289-63
	W3B3	All other per kl		R2-91	R2-77	R2-66	R2-55
	W3B4	Schools, municipal sports grounds and project sport grounds as per agreement		No Charge	No Charge	No Charge	No Charge
	W3B5	Curro Holdings – 250kl free per day as per deed of sale		R2-91	R2-77	R2-66	R2-55
Sundry Charges	W4A1	Testing of a meter (Call-out fee incl.)		R1 035-65	R991-30	R953-04	R912-17
	W4A2	Testing of a meter (Ind. / Bulk Meter)		Cost + 15% Min charge of R500-00	Cost + 15% Min charge of R500-00	Cost + 15% Min charge of R500-00	Cost + 15% Min charge of R500-00
	W4A3	Disconnection		R469-57	R449-57	R432-17	R413-91
	W4A4	Reconnection		R469-57	R449-57	R432-17	R413-91
	W4A5	Reconnection after normal working hrs		R940-00	R899-13	R864-35	R826-96
	W4A6	Administration fee – recalculation due to no meter access		R182-61	R175-65	R168-70	R161-74
	W4A7	Verification of a meter reading		R257-39	R246-09	R236-52	R226-09
	W4A8	Final and special readings		R235-65	R225-22	R216-52	R206-96
	W4A9	Call-out fee – Normal working hrs		R468-70	R448-70	R431-30	R413-04

Table C.3.1.1: Water Tariffs						
Consumer / Description	**Tariff Code**	**Category**	**22/23**	**21/22**	**20/21**	**19/20**
	W4A10	Call-out fee – After hrs	R938-26	R898-26	R863-48	R826-09
	W4A11	Replacement of damage meter	R1 259-13	R1 205-22	R1 159-13	R1 109-57
	W4A12	Removal of Meter (based on call out fee)	R1 035-65	R991-30	R953-04	R912-17
	W4A13	Registration of Borehole (Incl. inspection fee)	R351-30	R336-52	R323-48	R309-57
	W4A14	Repositioning of Meter (Excl. pipe)	R1 031-30	R986-96	R948-70	R907-83
	W4A15	Convert to water flow restrictor meter	R3 357-39	R3 213-04	R3 089-57	R2 956-52
	W4A16	Temporary connections – deposit	R8 835-00	R8 455-00	R8 130-00	R7 780-00
	W4A17	Temporary connection – usage per kl	R28-46	R25-19	R24-35	R23-39
	W4A18	Damage to Water Meter	Actual cost plus 15%	Actual cost plus 15%	Actual cost plus 15%	Actual cost plus 15%
	W4A19	Damage of Watermain	Actual cost plus R3 551-66	Actual cost plus R3 398-72	Actual cost plus R3 268-00	Actual cost plus R3 127-07
	W4A20	Damage of Service Connection (including water meter)	Actual cost plus R933-56	Actual cost plus R893-36	Actual cost plus R859-00	Actual cost plus R822-02
Illegal Connection / Tampering Fee	W5A1	1st Offence	R7 838-00	R7 500-00	R7 212-00	R6 901-00
	W5A2	2nd Offence – Must convert to a flow-restriction water meter at applicable tariff	R9 196-00	R8 800-00	R8 462-00	R8 098-00
	W5A3	3rd Offence (Restriction of service and remedial action fee = double previous offence fee)	Previous offence amount x 2	Previous offence amount x 2	Previous offence amount x 2	Previous offence amount x 2
Connection Fee	W6A1	20mm Connection Conventional Meter	R5 741-74	R5 494-78	R5 283-48	R5 055-65
	W6A2	20mm Connection Water Flow Restrictor Meter	R6 819-13	R6 525-22	R6 273-91	R6 003-48
	W6A3	Other Connections	Actual Cost + 15%	Actual Cost + 15%	Actual Cost + 15%	Actual Cost + 15%
	W6A4	Connections (Erf Boundary – by Dev.)	R1 493-04	R1 428-70	R1 373-91	R1 314-78
Bulk Service Dev. Fees	W7	Tariffs set out in Development Contribution Tariff list	Development Contributions will be determined as set out in the Annexure in respect of Dev. Contribution Policy			

The sewerage tariff structures for Overstrand Municipality for the 2022/2023 financial year and the previous three financial years are summarised in the table below (Subject to 15% VAT).

Table C.3.1.2: Sewerage Tariffs						
Consumer / Description	**Tariff Code**	**Category**	**22/23**	**21/22**	**20/21**	**19/20**
Sewerage – Single and Intermediate Residential (Dwelling house and duplex flats, Conventional sewers, small bore sewers and conservancy tanks)	SE7A1	0 – 35 kl per kl (based on 70% of 50 kl water usage) – per unit per month. Conservancy tank service only during office hours per month. For after-hours service, refer to tariff SE9B.	R15-53	R14-89	R14-32	R13-70
	SE7A2	Where no municipal water is used – per RUE per month. Conservancy tank service only during office hours per month. For after-hours service, refer to tariff SE9B.	R137-88	R131-57	R128-83	-
Sewerage – registered indigent households	SE7A4	0 – 4.2 kl – subsidised	-	R14-89	R14-32	R13-70
		0 – 7 kl - subsidised	R15-53	-	-	-
	SE7A5	4.3 – 35 kl per kl (based on 70% of max 50 kl water usage) – per unit per month, Conservancy tank service only during office hours per month. For after-hours service, refer to tariff SE9B.	-	R14-89	R14-32	R13-70
		8 – 35 kl per kl (based on 70% of max 50 kl water usage) – per unit per month, Conservancy tank service only during office hours per month. For after-hours service, refer to tariff SE9B.	R15-53	-	-	-
Sewerage – General residential (Blocks of flats and residential buildings)	SE7B1	0 – 45kl per kl (based on 90% of max 50 kl water usage) per unit per month.	R15-53	R14-89	R14-32	R13-70

Table C.3.1.2: Sewerage Tariffs							
Consumer / Description	**Tariff Code**	**Category**		**22/23**	**21/22**	**20/21**	**19/20**
Sewerage – Guest house, bed & breakfast establishments	SE7C1	Per kl (based on 70% of water usage) per unit per month		R15-53	R14-89	R14-32	R13-70
Consumption – All other (Including Commercial, Industrial, School, Sport, etc.)	SE7D1	Per kl (based on 90% of water usage) per unit per month – this percentage may be adjusted according to the Tariff Policy after investigation		R15-53	R14-89	R14-32	R13-70
Consumption - Departmental	SE7E1	0 – 35 kl per kl (based on 70% of max 50 kl water usage) per unit per month.		R15-53	R14-89	R14-32	R13-70
Basic Charge	SE8A	Basic Monthly Charge Developed sites per erf/unit per month.		R137-88	R132-20	R127-12	R121-65
	SE8A1	Basic Monthly Subsidy Residential Indigent as per paragraph A of the Indigent Policy per month		R137-88	R132-20	R127-12	R121-65
	SE8A2	Basic Monthly Subsidy Residential Indigent as per paragraph B, C & E of the Indigent Policy per month (01/07/2022 – 31/10/2022)		R115-09	R115-09	R115-09	R115-09
	SE8A2	Basic Monthly Subsidy Residential Indigent as per paragraph B, C & E of the Indigent Policy per month (01/11/2022 – 28/02/2023)		R76-73	R115-09	R115-09	R115-09
	SE8A2	Basic Monthly Subsidy Residential Indigent as per paragraph B, C & E of the Indigent Policy per month (01/03/2023 – 30/06/2023)		R38-36	R115-09	R115-09	R115-09
	SE8B	Basic Monthly Charge Undeveloped sites – cannot connect to the network per erf/unit per month.		R92-91	R89-08	R85-65	R81-96
	SE8C	Basic Monthly Charge Undeveloped sites – can connect to the network per erf/unit per month		R137-88	R132-20	R127-12	R121-65
	SE8D	Basic Monthly Charge Developed sites – with a septic Tank per erf/unit per month		R92-91	R89-08	R85-65	R81-96
	SE8E	Basic Monthly Charge – Low Cost Housing & Single Quarters per erf/unit per month		R92-91	R89-08	R85-65	R81-96
	SE8F1	Fixed Infrastructure Basic Charge per erf/unit per month		R9-60	R9-60	R9-60	R9-60
	SE8F2	Fixed Infrastructure Basic Charge per erf/unit per month		R3-43	R3-43	R3-43	R3-43
	SE8F3	Subsidised Fixed Infrastructure Basic Charge per erf/unit per month – Registered Indigent		R3-43	R3-43	R3-43	R3-43
Other Sewerage Charges and Sundry Charges	SE9A1	Vacuum Tanker Service for users not paying tariffs SE7 above – Provided on request	Vacuum Tanker service provided on request <6kl (per 6kl or part thereof)	R634-29	R608-14	R584-75	R559-57
	SE9A2		Vacuum Tanker service provided on request <5kl (per 5kl or part thereof)	R634-29	R608-14	R584-75	R559-57
	SE9A4		Vacuum Tanker service provided on request >6kl (per 6kl or part thereof)	R634-29	R608-14	R584-75	R559-57
	SE9A5		Call out fee for Tank Service request but no service due to another defect	R634-29	R608-14	R584-75	R559-57
	SE9A6		More than 3 pipes an additional fee per pipe for users not paying tariff SE7 above	R92-91	R89-08	R85-65	R81-96
	SE9B1	After Hours Vacuum Tanker Service – Provided on request	After hours per request < 6kl (per 6kl or part thereof)	R1 268-58	R1 216-28	R1 169-49	R1 119-13
	SE9B2		After hours per request > 6kl (per 6kl or part thereof)	R1 268-58	R1 216-28	R1 169-49	R1 119-13
	SE9B3		After hours per request < 5kl (per 5 kl or part thereof)	R1 268-58	R1 216-28	R1 169-49	R1 119-13
	SE9B2		After hours businesses with Public Toilets per removal	R380-90	R365-20	R351-15	R336-03
	SE9C1	Vacuum Tanker	Normal applicable Tariff (SE9A1 or SE9A2 or SE9A4) plus	R380-91	R365-21	R351-16	R336-03

Table C.3.1.2: Sewerage Tariffs							
Consumer / Description	**Tariff Code**	**Category**		**22/23**	**21/22**	**20/21**	**19/20**
		Service outside urban areas – Provided on request	additional per hour plus SE9C2				
	SE9C2		Normal applicable Tariff (SE9A1 or SE9A2 or SE9A4) plus additional per km	R18-60	R17-83	R17-14	R16-40
	SE9C6	After Hours Vacuum Tanker Service outside urban areas – Provided on request	After hours applicable Tariff (SE9B1 or SE9B2 or SE9B3) plus additional per hour plus SE9C7	R380-90	R365-20	R351-15	R336-03
	SE9C7		After hours applicable Tariff (SE9B1 or SE9B2 or SE9B3) plus additional per km	R18-60	R17-83	R17-14	R16-40
	SE9D1	Testing and Connection Fees	Testing of septic and conservancy tanks per test	R1 650-44	R1 582-61	R1 521-74	R1 456-52
	SE9D2		Small bore sewerage connection fee + tank test	R7 573-04	R7 260-87	R6 981-74	R6 680-87
	SE9D3		Sewer connection	R5 682-61	R5 448-70	R5 231-30	R5 006-09
	SE9E1	Disposal	Charge per kl or part thereof	R15-65	R80-00	R76-52	R73-04
Bulk services development fees	SEW10	Bulk services development fees		Development Contributions will be determined as set out in the Annexure in respect of Development Contribution Policy			
Illegal Connection / Tampering Fee	SE11A	1st Offence		R7 783-00	R7 462-00	R7 175-00	R6 866-00
	SE11B	2nd Offence (SE11A x 2)		R15 566-00	R14 924-00	R14 348-00	R13 730-00

C.3.2. Metering, Billing and Free Basic Services

The table below gives an overview of the metering, billing and free basic services of Overstrand Municipality.

Table C.3.2.1: Overview of Metering, Billing and Free Basic Services

Regulations Ref. #	Description	Unit	Year 0	Year - 1	Year - 2
			FY2022/23	FY2021/22	FY2020/21
	UNITS SUPPLIED (as per water services access profile)				
10.2 (b) (i)	Household water connections (house and yard connections)	Nr	**45 920**	**45 013**	**44 108**
10.2 (b) (iv)	Household sewerage connections	Nr	**45 737**	**44 830**	**43 925**
	METERING				
	Metered Water Connections (aligned with Table C2.1)				
	Residential (Exclude communal services)	Nr	38 851	37 977	37 103
	Commercial / Business	Nr	2 488	2 358	2 227
	Industrial	Nr	60	58	54
	Government / Institutional	Nr	35	36	35
	Other	Nr	1 035	968	905
	Sub-Total: Metered Water Connections	**Nr**	**42 469**	**41 397**	**40 324**
	Proportion of metered connections (residential) *	%	85%	84%	84%
	Total number of meters	Nr	**42 469**	**41 397**	**40 324**
10.2 (b) (vi)	Total number of new connections (aligned with Table C.2.1)	Nr	742	552	315
10.2 (e) (i)	Total number of new meters installed	Nr	742	552	315
	Proportion of new connections, metered	%	100.0%	100.0%	100.0%
	Number of meters tested	Nr	11	17	23
10.2 (e) (ii)	Proportion of meters tested to total number of meters	%	0.0%	0.0%	0.1%
	Number of meters replaced	Nr	145	1 782	25
10.2 (e) (ii)	Proportion of meters replaced to total number of meters	%	0.3%	4.3%	0.1%
	BILLING				
	Customer billing (water and sewerage)		**Nr**	**Nr**	**Nr**
	Residential	Nr	38 851	37 977	37 103
	Commercial / Business	Nr	2 488	2 358	2 227
	Industrial	Nr	60	58	54
	Government / Institutional	Nr	35	36	35
	Other	Nr	1 035	968	905
	Sub-Total: Customers billed	Nr	**42 469**	**41 397**	**40 324**
	Proportion of bills to metered connections	%	**100%**	**100%**	**100%**
	Residential	%	100%	100%	100%
	Commercial / Business	%	100%	100%	100%
	Industrial	%	100%	100%	100%
	Government / Institutional	%	100%	100%	100%
	Other	%	100%	100%	100%
	FREE BASIC SERVICES				
	Nr customers receiving:				
	Free Basic Water	Nr	1 491	7 367	7 278
10.2 (b) (v)	Free Basic Sanitation	Nr	1 491	7 367	7 278
	Proportion of Free Basic Services				
	Water	%	4%	19%	20%
	Sewerage	%	4%	19%	20%

Note: * All residential consumers in the urban areas of Overstrand Municipality are metered. The "Water Services Access Profile" however includes the consumers on the farms and the backyard dwellers on formal erven in the urban areas. Backyard dwellers use the service of the main house, which is metered. Consumers on the farms utilise their own water sources, which is not metered by the Municipality, therefore the 84% and 85% compliance in the above table.

C.3.3. Revenue Collection and Cost Recovery

The table and figures below give an overview of Overstrand Municipality's water services revenue collection and cost recovery (Unaudited figures).

Table C.3.3.1: Overview of Water Services Revenue Collection and Cost Recovery

Regulations Ref. #	Description	Year 0	Year - 1	Year - 2
		FY2022/23	FY2021/22	FY2020/21
	INCOME			
	Billed			
	Water reticulation / provision	R 161 327 587	R 143 848 921	R 139 689 136
	Sewerage / wastewater	R 105 260 572	R 111 790 978	R 92 431 399
	Sub-Total: Billed	**R 266 588 159**	**R 255 639 899**	**R 232 120 535**
	Collections			
	Water reticulation / provision	R 171 080 016	R 153 516 132	R 156 070 339
	Sewerage / wastewater	R 114 598 887	R 121 263 147	R 108 943 003
	Sub-Total: Collections	**R 285 678 902**	**R 274 779 279**	**R 265 013 342**
	Equitable share income			
	Water reticulation / provision	R 11 970 646	R 12 576 728	R 13 426 079
	Sewerage / wastewater	R 12 300 863	R 11 921 680	R 17 136 139
	Sub-Total: Equitable share income	**R 24 271 509**	**R 24 498 408**	**R 30 562 218**
	EXPENDITURE (O&M)			
	Water services	R 153 152 405	R 145 142 796	R 137 409 799
	Sewerage / wastewater services	R 140 730 503	R 112 745 218	R 99 329 089
	Total: Water Services O&M	**R 293 882 908**	**R 257 888 014**	**R 236 738 888**
	COST RECOVERY ANALYSIS / RATIOS	**%**	**%**	**%**
10.2 (d) (ii)	**Billed as % of Cost**			
	Water	113.2%	107.8%	111.4%
	Sewerage	83.5%	109.7%	110.3%
	Total	**99.0%**	**108.6%**	**111.0%**
10.2 (d) (iii)	**Unrecovered as % of Cost**			
	Water services	1.4%	2.0%	-2.2%
	Sewerage / wastewater services	2.1%	2.2%	0.6%
	Total	**1.8%**	**2.1%**	**-1.0%**

The figure below gives an overview of the revenue collection and cost recovery profile for water services for Overstrand Municipality.

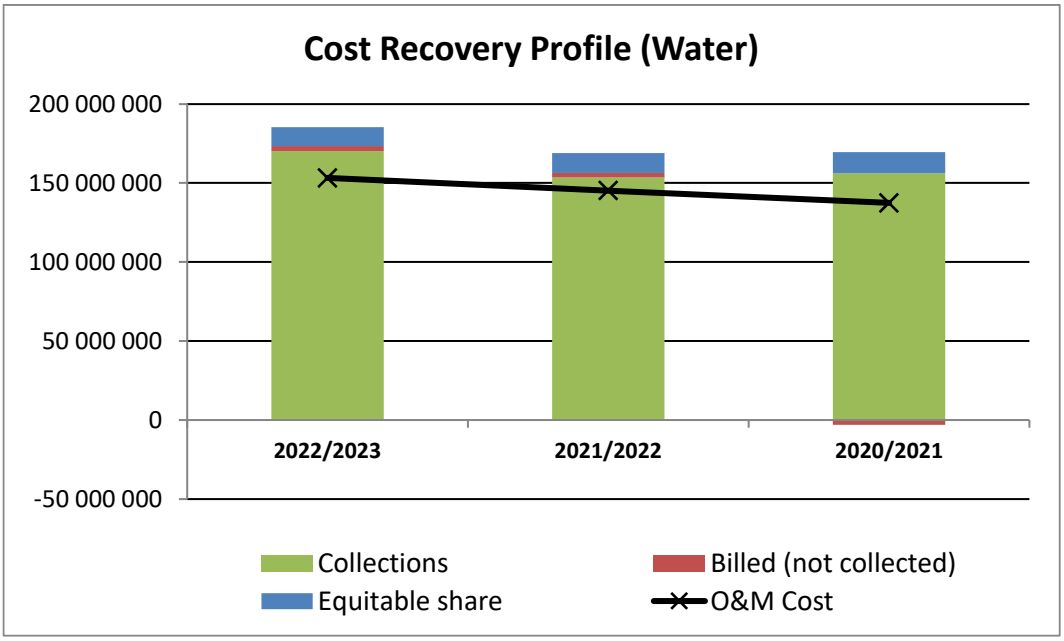


Figure C.3.3.1: Revenue Collection and Cost Recovery Profile (Water)

The figure below gives an overview of the revenue collection and cost recovery profile for wastewater services for Overstrand Municipality.

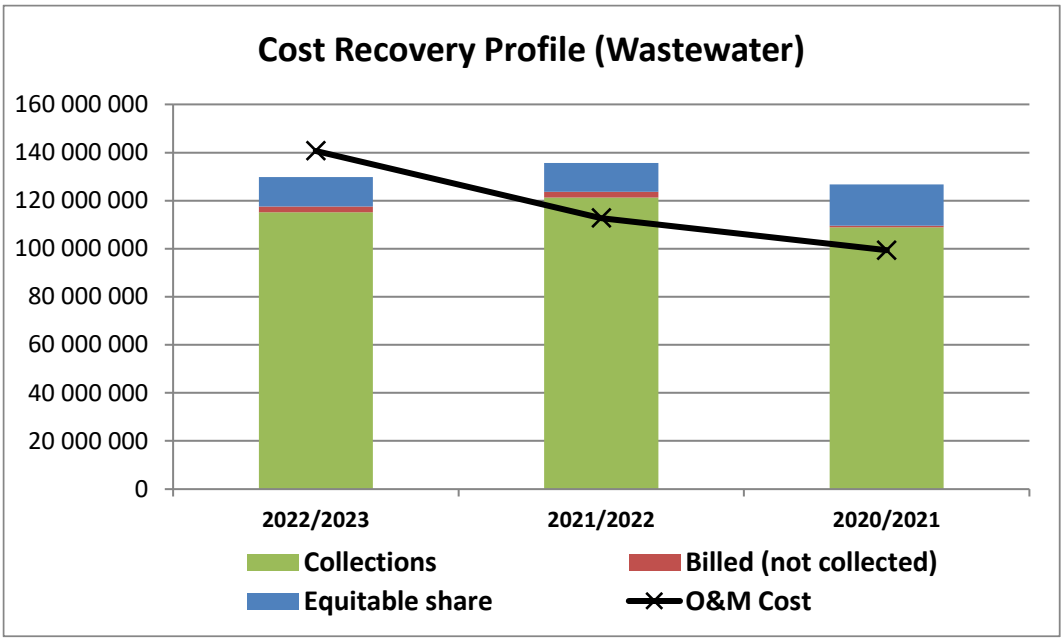


Figure C.3.3.2: Revenue Collection and Cost Recovery Profile (Wastewater)

Overstrand Municipality's Operational Budget for water services for the last four financial years are summarised in the table below (Unaudited figures).

Table C.3.3.2: Operational Budget for Water Services for the Last Four Financial Years					
Category	**Vote**	**Actual 22/23**	**Actual 21/22**	**Actual 20/21**	**Actual 19/20**
Expenditure (2900)					
Employee Related Costs: Wages and Salaries	3000	R13 248 820	R12 049 600	R11 447 986	R10 169 806
Employee Related Costs: Social Contributions	3100		R1 927 755	R1 779 332	R1 685 576
Dept Impairment	3500	R2 157 828	R1 589 611	R311 297	R4 213 698
Depreciation and Asset Impairment	3700	R24 123 324	R27 025 840	R28 375 390	R27 748 998
Interest Expense: External Borrowings	3900	R19 118 636	R19 288 546	R19 530 222	R17 319 306
Other Materials	4110	R3 979 479	R3 417 689	R3 048 286	R3 803 254
Contracted Services	4200	-	R4 001 503	R5 934 624	R1 965 742
Other Expenses	4400	R7 134 620	R8 724 745	R5 028 797	R3 830 631
Bad Debt Written Off	-	R3 197 787	-	-	-
Total Direct Operating Expenditure	**2900**	**R72 960 494**	**R78 025 290**	**R75 455 934**	**R70 737 011**
Bulk Water Services Operation and Maintenance Contract		R65 326 154	R47 284 600	R39 883 885	R35 634 946
Water Testing		-	R1 005 626	R833 654	R1 204 718
Water Management Charges		-	R1 125 600	R1 100 550	R1 013 640
Groundwater Management		-	R2 406 997	R2 292 652	R2 163 525
Contracted Services: Engineering		-	R1 069 077	R1 026 489	R1 947 468
Departmental Charges		R14 865 757	R14 225 606	R16 816 635	R15 955 068
Total Expenditure		**R153 152 405**	**R145 142 796**	**R137 409 799**	**R128 656 376**
Income (100)					
Service Charges	400	R158 055 781	R142 896 923	R131 054 149	R133 581 907
Fines	1300	R144 071	R131 398	R28 848	R255 024
Transfers Recognised: Operating	1600	R13 838 716	R12 576 728	R13 426 079	R13 650 111
Transfers Recognised: Capital	1610	R0	R0	R7 881 744	R5 807 732
Other Revenue	1700	R1 259 665	R820 600	R724 395	R368 395
Total Direct Operating Revenue	**1900**	**R173 298 233**	**R156 425 649**	**R153 115 215**	**R153 663 169**
Total Surplus / Deficit		**R20 145 828**	**R11 282 853**	**R15 705 416**	**R25 006 793**

Overstrand Municipality's Operational Budget for sanitation services (Excluding Stormwater and Public Toilets) for the last four financial years are summarised in the table below (Unaudited figures).

Table C.3.3.3: Operational Budget for Sanitation Services for the Last Four Financial Years					
Category	**Vote**	**Actual 22/23**	**Actual 21/22**	**Actual 20/21**	**Actual 19/20**
Expenditure					
Employee Related Costs: Wages and Salaries	3000	R24 750 294	R20 083 245	R17 805 217	R17 416 314
Employee Related Costs: Social Contributions	3100		R2 904 941	R2 280 173	R2 061 983
Dept Impairment	3500	R1 512 231	R647 604	R894 325	R1 666 676
Depreciation and Asset Impairment	3700	R20 561 409	R19 468 953	R17 991 070	R16 807 034
Interest Expense: External Borrowings	3900	R12 472 675	R11 578 860	R11 454 849	R11 384 134
Other Materials	4110	R6 849 065	R6 113 599	R5 050 508	R4 965 764
Contracted Services	4200	-	R14 168 099	R7 782 727	R6 371 340
Other Expenses	4400	R2 306 327	R2 429 112	R1 878 691	R1 578 159
Bad Debt Written Off	-	R1 139 947	-	-	-
Total Direct Operating Expenditure	**2900**	**R69 591 948**	**R77 394 413**	**R65 137 561**	**R62 251 404**
Bulk Water Services Operation and Maintenance Contract		R50 828 232	R17 595 493	R15 883 380	R15 728 813
Water Testing		-	R341 808	R366 453	R424 760
Contracted Services: Engineering		-	R532 811	R980 540	R228 839
Departmental Charges		R20 310 323	R16 880 693	R16 961 155	R16 092 175
Total Expenditure		**R140 730 503**	**R112 745 218**	**R99 329 089**	**R94 725 991**
Income					
Service Charges	400	R100 655 126	R93 177 101	R87 090 602	R80 871 157

Table C.3.3.3: Operational Budget for Sanitation Services for the Last Four Financial Years					
Category	**Vote**	**Actual 22/23**	**Actual 21/22**	**Actual 20/21**	**Actual 19/20**
Fines	1300	R0	R0	R0	R0
Transfers Recognised: Operating	1600	R16 053 554	R11 921 680	R17 136 139	R17 202 168
Transfers Recognised: Capital	1610	R0	R18 034 404	R4 852 376	R126 000
Other Revenue	1700	R852 754	R579 473	R488 421	R248 387
Total Direct Operating Revenue	**1900**	**R117 561 435**	**R123 712 658**	**R109 567 538**	**R98 447 712**
Total Surplus / Deficit		**R23 169 068**	**R10 967 440**	**R10 238 449**	**R3 721 721**

The table below gives an overview of the consumer debtors for 30, 60 and 90 days for the last ten financial years, as on the 30th of June.

Table C.3.3.4 Consumer Debtors for 30, 60 and 90 days for the last ten financial years (end of June)										
Days	**2022/2023**	**2021/2022**	**2020/2021**	**2019/2020**	**2018/2019**	**2017/2018**	**2016/2017**	**2015/2016**	**2014/2015**	**2013/2014**
30 Days	R20 795 359	R12 652 079	R11 303 670	R12 303 545	R8 867 109	R8 400 107	R7 978 076	R7 267 047	R7 407 509	R5 966 863
60 Days	R10 024 275	R3 767 724	R2 704 243	R4 413 062	R2 561 997	R1 791 955	R2 082 481	R2 646 824	R2 522 224	R1 627 291
90 Days	R7 495 715	R2 532 526	R1 931 764	R2 573 876	R1 702 680	R1 157 743	R1 427 636	R1 672 085	R1 644 146	R1 072 680

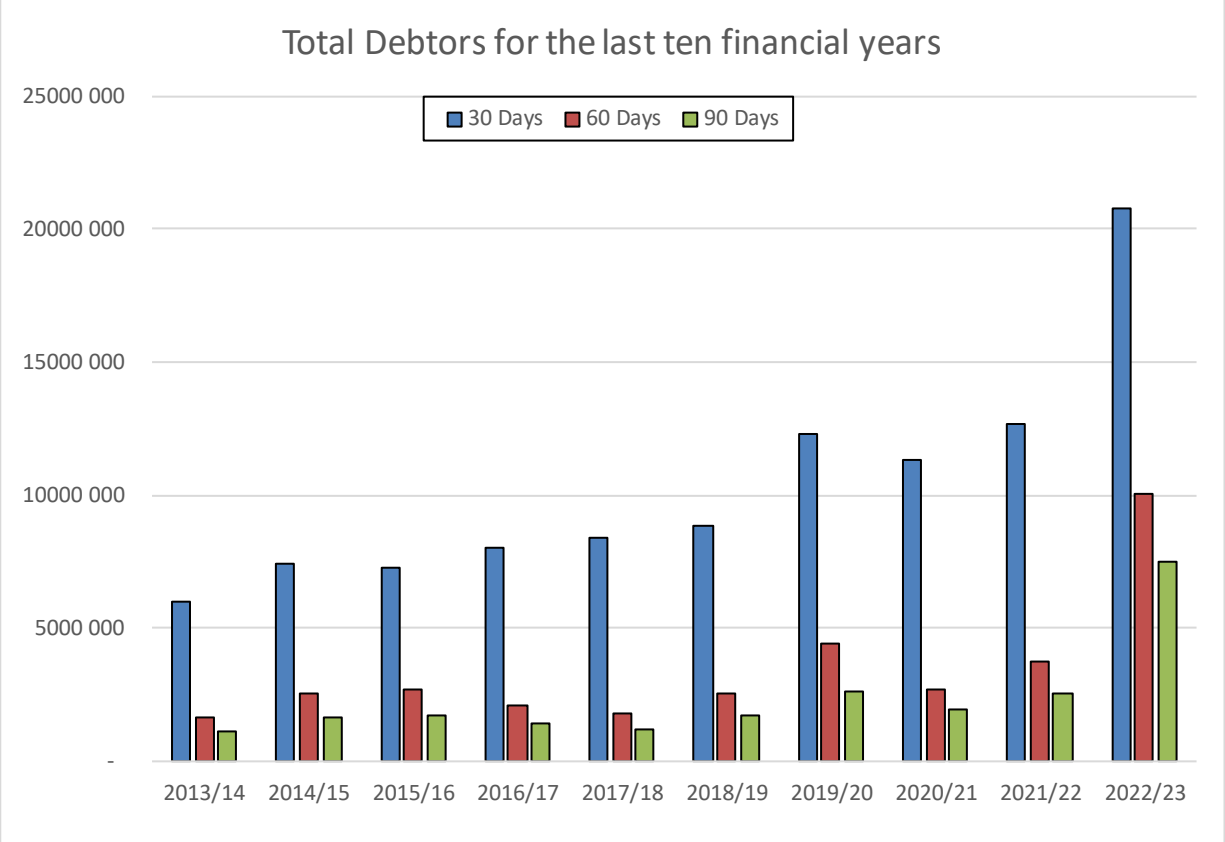


Figure C.3.3.3: Debtors for the Last Ten Financial Years at the end of June

C.4. Water Quality

C.4.1. Sampling Programme

Comprehensive Operational and Compliance Water Quality and Final Effluent Monitoring Programmes are implemented by Overstrand Municipality. The tables below give an overview of Overstrand Municipality's compliance sampling programmes for potable water quality for the various water distribution systems.

Table C.4.1.1: Sampling Programme for Potable Water Quality

Treated Water Schemes: Buffels River (Reticulation)

Registered Sites per Scheme		Active (yes/no)			Determinands per Category (Compliance SANS 241:2015)	Frequency (days)		
		Year 0	Year-1	Year-2		Year 0	Year-1	Year-2
#	Name	FY2022/23	FY2021/22	FY2020/21		FY2022/23	FY2021/22	FY2020/21
1	Betty's Bay (Stoney Point Harbour Stand-pipe)	Yes	Yes	Yes	**Microbiological (Health)**			
2	Rooi-Els (Drummond Arms Rest.)	-	Yes	Yes	E.Coli (Count per 100 ml)	30	30	30
3	Betty's Bay Harold Porter Botanical Gardens	Yes	Yes	Yes				
4	Pringle Bay 365 Restaurant	Yes	Yes	Yes	**Aesthetic**			
5	Rooi-Els Reservoir	Yes	-	-	Colour (mg/l)	30	30	30
					Conductivity at 25 °C (mS/m)	30	30	30
					Iron as Fe (µg/l)	30	30	30
					Manganese as Mn (µg/l)	30	30	30
					Operational			
					Turbidity NTU	30	30	30
					Aluminium as Al (µg/l)	30	30	30
					Total Coliform Count per 100 ml	30	30	30
					Heterotrophic Plate Count count per 1ml	30	30	30
					pH at 25°C	30	30	30
					Disinfectant Residual			
					Free available chlorine (mg/l)	30	30	30

Table C.4.1.1: Sampling Programme for Potable Water Quality

Treated Water Schemes: Kleinmond (Reticulation)

Registered Sites per Scheme		Active (yes/no)			Determinands per Category (Compliance SANS 241:2015)	Frequency (days)		
		Year 0	Year-1	Year-2		Year 0	Year-1	Year-2
#	Name	FY2022/23	FY2021/22	FY2020/21		FY2022/23	FY2021/22	FY2020/21
1	Municipal Office	Yes	Yes	Yes	**Microbiological (Health)**			
2	Kleinmond Stoor	Yes	Yes	Yes	E.Coli (Count per 100 ml)	30	30	30
					Aesthetic			
					Colour (mg/l)	30	30	30
					Conductivity at 25 °C (mS/m)	30	30	30
					Operational			
					Turbidity NTU	30	30	30
					Aluminium as Al (µg/l)	30	30	30
					Total Coliform Count per 100 ml	30	30	30
					Heterotrophic Plate Count count per 1ml	30	30	30
					pH at 25°C	30	30	30
					Disinfectant Residual			
					Free available chlorine (mg/l)	30	30	30

Table C.4.1.1: Sampling Programme for Potable Water Quality								
Treated Water Schemes: Hermanus (Reticulation)								
Registered Sites per Scheme		**Active (yes/no)**			**Determinands per Category (Compliance SANS 241:2015)**	**Frequency (days)**		
		Year 0	**Year-1**	**Year-2**		**Year 0**	**Year-1**	**Year-2**
	Name	**FY2022/23**	**FY2021/22**	**FY2020/21**		**FY2022/23**	**FY2021/22**	**FY2020/21**
1	House next to Marine Hotel	Yes	Yes	Yes	**Microbiological (Health)**			
2	Grotto Beach Voëlklip	Yes	Yes	Yes	E.Coli (Count per 100 ml)	30	30	30
3	30 Piet Retief Street Sandbaai	Yes	Yes	Yes				
4	6 Riverside Drive Fisherhaven	Yes	Yes	Yes	**Aesthetic**			
5	43 Cross Street	-	Yes	Yes	Colour (mg/l)	30	30	30
6	Hermanus High School	Yes	Yes	Yes	Iron as Fe (µg/l)	30	30	30
7	Onrus Eiland	Yes	Yes	Yes	Manganese as Mn (µg/l)	30	30	30
8	Onrus Douglas Street (Clinic)	Yes	-	-	Conductivity at 25 °C (mS/m)	30	30	30
					Disinfectant Residual			
					Free available chlorine (mg/l)	30	30	30
					Operational			
					Turbidity NTU	30	30	30
					Aluminium as Al (µg/l)	30	30	30
					Total Coliform Count per 100 ml	30	30	30
					Heterotrophic Plate Count count per 1ml	30	30	30
					pH at 25°C	30	30	30

Table C.4.1.1: Sampling Programme for Potable Water Quality								
Treated Water Schemes: Stanford (Reticulation)								
Registered Sites per Scheme		**Active (yes/no)**			**Determinands per Category (Compliance SANS 241:2015)**	**Frequency (days)**		
		Year 0	**Year-1**	**Year-2**		**Year 0**	**Year-1**	**Year-2**
#	**Name**	**FY2022/23**	**FY2021/22**	**FY2020/21**		**FY2022/23**	**FY2021/22**	**FY2020/21**
1	Municipal Office	Yes	Yes	Yes	**Microbiological (Health)**			
2	Taxi Rank	-	-	Yes	E.Coli at Reticulation (Count per 100 ml)	30	30	30
3	WWTW Drinking Water Tap	Yes	Yes	-				
3	Stanford Bulk Works	Yes	Yes	-	**Aesthetic**			
					Colour (mg/l)	30	30	30
					Conductivity at 25 °C (mS/m)	30	30	30
					Operational			
					Turbidity NTU	30	30	30
					Total Coliform Count per 100 ml	30	30	30
					Heterotrophic Plate Count count per 1ml	30	30	30
					pH at 25°C	30	30	30
					Disinfectant Residual			
					Free available chlorine (mg/l)	30	30	30

Table C.4.1.1: Sampling Programme for Potable Water Quality								
Treated Water Schemes: Gansbaai (Reticulation)								
Registered Sites per Scheme		**Active (yes/no)**			**Determinands per Category (Compliance SANS 241:2015)**	**Frequency (days)**		
		Year 0	**Year-1**	**Year-2**		**Year 0**	**Year-1**	**Year-2**
#	**Name**	**FY2022/23**	**FY2021/22**	**FY2020/21**		**FY2022/23**	**FY2021/22**	**FY2020/21**
1	Gansbaai (Muni. Office)	Yes	Yes	Yes	**Microbiological (Health)**			
2	Kleinbaai (Superette)	Yes	Yes	Yes	E.Coli (Count per 100 ml)	30	30	30
3	De Kelders (44 De Villiers)	-	Yes	Yes				
4	Franskraal (OK)	Yes	Yes	Yes	**Aesthetic**			
5	Franskraal Uilkraal	Yes	Yes	Yes	Colour (mg/l)	30	30	30
6	Blompark (6 Roos Str.)	-	Yes	Yes	Conductivity at 25 °C (mS/m)	30	30	30
7	Masekhane (1 Walter Sisulu Str)	-	Yes	Yes				
8	De Kelders (Cliff Street)	Yes	-	-	**Operational**			
9	Masekhane Built It	Yes	-	-	Aluminium as Al (µg/l)	30	30	30
10	Gansbaai WWTW Drinking Water Tap	Yes	-	-	pH at 25°C	30	30	30
					Heterotrophic Plate Count count per 1ml	30	30	30
					Turbidity NTU	30	30	30
					Total Coliform Count per 100 ml	30	30	30
					Disinfectant Residual			
					Free available chlorine (mg/l)	30	30	30

Table C.4.1.1: Sampling Programme for Potable Water Quality								
Treated Water Schemes: Pearly Beach (Reticulation)								
Registered Sites per Scheme		**Active (yes/no)**			**Determinands per Category (Compliance SANS 241:2015)**	**Frequency (days)**		
		Year 0	**Year-1**	**Year-2**		**Year 0**	**Year-1**	**Year-2**
	Name	**FY2022/23**	**FY2021/22**	**FY2020/21**		**FY2022/23**	**FY2021/22**	**FY2020/21**
1	INFO Centre	Yes	Yes	Yes	**Microbiological (Health)**			
2	Public Toilets	-	-	Yes	E.Coli (Count per 100 ml)	30	30	30
3	Castle Rock	Yes	Yes	-				
					Aesthetic			
					Colour (mg/l)	30	30	30
					Iron as Fe (µg/l)	30	30	30
					Conductivity at 25 °C (mS/m)	30	30	30
					Operational			
					Turbidity NTU	30	30	30
					Aluminium as Al (µg/l)	30	30	30
					Total Coliform Count per 100 ml	30	30	30
					Heterotrophic Plate Count count per 1ml	30	30	30
					pH at 25°C	30	30	30
					Disinfectant Residual			
					Free available chlorine (mg/l)	30	30	30

Table C.4.1.1: Sampling Programme for Potable Water Quality								
Treated Water Schemes: Baardskeerdersbos (Reticulation)								
Registered Sites per Scheme		**Active (yes/no)**			**Determinands per Category (Compliance SANS 241:2015)**	**Frequency (days)**		
		Year 0	**Year-1**	**Year-2**		**Year 0**	**Year-1**	**Year-2**
#	**Name**	**FY2022/23**	**FY2021/22**	**FY2020/21**		**FY2022/23**	**FY2021/22**	**FY2020/21**
1	Community Hall (House Hoofstraat 12)	Yes	Yes	Yes	**Microbiological (Health)**			
2	Marietjies Pub	-	-	Yes	E.Coli (Count per 100 ml)	30	30	30
3	Community Centre	Yes	Yes	-				
					Aesthetic			
					Colour (mg/l)	30	30	30
					Iron as Fe (µg/l)	30	30	30
					Manganese as Mn (µg/l)	30	30	30
					Conductivity at 25 °C (mS/m)	30	30	30
					Operational			
					pH at 25°C	30	30	30
					Heterotrophic Plate Count count per 1ml	30	30	30
					Turbidity NTU	30	30	30
					Total Coliforms count per 100 ml	30	30	30
					Disinfectant Residual			
					Free available chlorine (mg/l)	30	30	30

Table C.4.1.1: Sampling Programme for Potable Water Quality								
Treated Water Schemes: Buffeljags Bay (Reticulation)								
Registered Sites per Scheme		**Active (yes/no)**			**Determinands per Category (Compliance SANS 241:2015)**	**Frequency (days)**		
		Year 0	**Year-1**	**Year-2**		**Year 0**	**Year-1**	**Year-2**
#	**Name**	**FY2022/23**	**FY2021/22**	**FY2020/21**		**FY2022/23**	**FY2021/22**	**FY2020/21**
1	Community Hall	Yes	Yes	Yes	**Microbiological (Health)**			
2	Reservoir Outflow	Yes	Yes	Yes	E.Coli (Count per 100 ml)	30	30	30
					Aesthetic			
					Colour (mg/l)	30	30	30
					Iron as Fe at reservoir outflow (µg/l)	30	30	30
					Conductivity at 25 °C (mS/m)	30	30	30
					Chloride as Cl (mg/l)	-	-	-
					Operational			
					Turbidity NTU	30	30	30
					Total Coliform Count per 100 ml	30	30	30
					Heterotrophic Plate Count count per 1ml	30	30	30
					pH at 25°C	30	30	30
					Disinfectant Residual			
					Free available chlorine (mg/l)	30	30	30

The operational water sampling programmes of Overstrand Municipality complies with the minimum monitoring requirements of the SANS 241-2:2015 (Table 1: Minimum monitoring for prescribed process risk indicators) for the various WTWs and distribution systems.

The table below indicates the compliance of the E.Coli monitoring frequency in the water distribution systems of Overstrand Municipality, in terms of the minimum requirements of SANS:241-2: 2015 (Table 2). The period assessed was for samples taken from July 2022 to June 2023.

Table C.4.1.2: Overstrand Municipality's Compliance of the Monthly E.Coli Monitoring Frequency in the Water Distribution Systems in Terms of the Minimum Requirements of SANS 241-2:2015 (Table 2).

Distribution System	Population served	Required number of monthly samples (SANS 241-2:2015: Table 2)	Number of monthly E.Coli samples taken by Municipality during 2022/2023
Buffels River	3 593	2.0	12.4
Kleinmond	8 698	2.0	8.5
Greater Hermanus	76 410	14.6	24.6
Stanford	6 375	2.0	8.4
Greater Gansbaai	22 531	4.3	23.3
Pearly Beach	1 317	2.0	8.6
Baardskeerdersbos	129	2.0	9.0
Buffeljags Bay	155	2.0	6.6

It can be noted from the above table that the number of monthly E.Coli samples taken by the Municipality during the 2022/2023 financial year was far more than the required number of samples for all the water distribution systems.

The table below gives an overview of Overstrand Municipality's compliance sampling programme for wastewater (final effluent) quality.

Table C.4.1.3: Sampling Programme for Wastewater Effluent Quality

Registered Sites		Active			Determinands per Category	Frequency (days)		
		Year 0	Year-1	Year-2		Year 0	Year-1	Year-2
#	Name	FY2022/23	FY2021/22	FY2020/21		FY2022/23	FY2021/22	FY2020/21
1	Kleinmond	Yes	Yes	Yes	**Microbiological**			
2	Hawston	Yes	Yes	Yes	Faecal Coliforms (count per 100mℓ)	30	30	30
3	Hermanus	Yes	Yes	Yes				
4	Stanford	Yes	Yes	Yes	**Chemical**			
5	Gansbaai	Yes	Yes	Yes	Ammonia Nitrogen (mg/ℓ as N)	30	30	30
6	Pearly Beach	Yes	Yes	Yes	Nitrate Nitrogen (mg/ℓ as N)	30	30	30
					Nitrite Nitrogen (mg/ℓ as N)	30	30	30
					Ortho Phosphate (mg/ℓ as P)	30	30	30
					COD (mg/ℓ) Filtered	-	-	30
					COD (mg/ℓ) Unfiltered	30	30	30
					Free Chlorine (mg/ℓ)	30	30	30
					Physical			
					Electrical Conductivity (mS/m)	30	30	30
					pH	30	30	30
					Total Suspended Solids (mg/ℓ)	30	30	30

The table below gives an overview of the compliance with regard to the water quality and final effluent compliance sampling programmes, as taken from the DWS IRIS.

Table C.4.1.4: Compliance to the Sampling Programme (s)

Measurable / Enabling Factor	Unit	Year 0 FY2022/23						Year -1 FY2021/22						Year -2 FY2020/21					
		MAH	CAH	CCH	CNA	O	D	MAH	CAH	CCH	CNA	O	D	MAH	CAH	CCH	CNA	O	D
Potable Water Quality																			
Supply system submissions	Nr registered	Information not available on IRIS						Information not available on IRIS						Information not available on IRIS					
	Nr submitted																		
	Annual %																		
Monitoring compliance	Average %																		
Certified Data	Average %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0%	100%	100%	100%	100%
In-Time Submission	Annual %	83%	100%	85%	83%	83%	83%	79%	100%	81%	77%	77%	79%	80%	0%	80%	77%	79%	81%
Wastewater Quality																			
		M	C	P	O			M	C	P	O			M	C	P	O		
Monitoring Compliance	Average %	96%	83%	96%	-			94%	71%	93%	-			100%	32%	40%	-		
Certified Data	Average %	100%	100%	100%	-			100%	100%	100%	-			100%	100%	100%	-		
In-Time Submission	Average %	81%	84%	82%	-			66%	69%	68%	-			70%	70%	70%	-		

Legend **MAH**: Microbiological Acute Health; **CAH**: Chemical Acute Health; **CCH**: Chemical Chronic Health; **CNA**: Chemical Non Health Aesthetic; **O**: Operational; **D**: Disinfectant

Legend Wastewater **M**: Microbiological; **C**: Chemical; **P**: Physical; **O**: Operational

Information not correct in IRIS, ongoing discussions with DWS. Compliance data sometimes to be re-submitted due to techical problems at IRIS, which result in low In-Time Submission percentages.

The table below gives an overview of the water quality monitoring from the WSDP Guide Framework perspective.

Table C.4.1.5: Water Quality Monitoring Overview from WSDP Guide Framework Perspective

WSDP Ref #	Measurable / Enabling Factor	Unit	Year 0 FY2022/23	Year - 1 FY2021/22	Year - 2 FY2020/21
6.3	**Water Supply and Quality**				
6.3.2	Process Control in place	yes/total WTW in %	100%	100%	100%
6.3.3	Monitoring Programme in place	yes/total schemes in %	100%	100%	100%
6.3.4	Sample Analysis Credibility	Average %	100%	100%	100%
9.2	**Monitoring**				
9.2.1	% of water abstracted monitored: Surface water	Q monitored / Q abstracted in %	100%	100%	100%
9.2.2	% of water abstracted monitored: Ground water	Q monitored / Q abstracted in %	100%	100%	100%
9.2.3	% of water abstracted monitored: External Sources (Bulk purchase)	Q monitored own / Q purchased in %	N/A	N/A	N/A
9.2.6	Water compliance quality for formal schemes? (1: daily, 2: weekly, 3: monthly, 4: annually, 5: never)	frequency	Monthly	Monthly	Monthly
9.2.7	Water compliance quality for rudimentary schemes? (1: daily, 2: weekly, 3: monthly, 4: annually, 5: never)	frequency	N/A	N/A	N/A
9.2.9	Is the number sufficient in accordance to the SANS241 requirements?	yes/no	Yes	Yes	Yes
9.3	**Water Quality**				
	Is there a water safety plan in place?	yes/no	Yes	Yes	Yes
9.3.1	Reporting on quality of water taken from source: urban & rural	yes/total schemes in %	100%	100%	100%
9.3.5	Quality of water taken from source: urban - % monitored by WSA self?	monitored by WSA / total schemes in %	100%	100%	100%
9.3.6	Quality of water taken from source: rural - % monitored by WSA self?	monitored by WSA / total schemes in %	N/A	N/A	N/A
9.3.9	Are these results available in electronic format?	yes/no	Yes	Yes	Yes

The table below gives an overview of the wastewater quality monitoring from the WSDP Guide Framework perspective.

Table C.4.1.6 : Wastewater Quality Monitoring Overview from WSDP Guide Framework Perspective					
WSDP Ref #	Measurable / Enabling Factor	Unit	Year 0	Year - 1	Year - 2
			FY2022/23	FY2021/22	FY2020/21
5.3.1	**Monitoring and Sample Failure**				
5.3.1.1	Compliance Monitoring: % of tests performed as required by general limits /special limits/ license requirements (Average % over previous 12 months)	Annual %	91%	86%	57%
5.3.1.2	Operational: % of tests performed as required by general limits /special limits/ license requirements (Average % over previous 12 months)	Annual %	Not captured on IRIS and recorded by Process Controllers at each of the WWTW		
6.4	**Wastewater Supply and Quality**				
6.4.2	Process Control in place	yes/total WWTW in %	Yes	Yes	Yes
6.4.3	Monitoring Programme in place	yes/total WWTW in %	Yes	Yes	Yes
6.4.4	Sample Analysis Credibility	Average %	100%	100%	100%
9.2	**Monitoring**				
9.2.10	Is the number sufficient in accordance to licences?	yes/no	Yes	Yes	Yes
9.3	**Water Quality**				
	Is there a wastewater risk abatement plan in place?	yes/no	Yes	Yes	Yes
9.3.2	Reporting on quality of water returned to the resource: urban	yes/total WWTW in %	100%	100%	100%
9.3.3	Reporting on quality of water returned to the resource: rural	yes/total WWTW in %	N/A	N/A	N/A
9.3.7	Quality of water returned to resource: urban - % monitored by WSA self?	monitored by WSA / urban WWTW in %	100%	100%	100%
9.3.8	Quality of water returned to resource: rural - % monitored by WSA self?	monitored by WSA / rural WWTW in %	N/A	N/A	N/A
9.3.9	Are these results available in electronic format?	yes/no	Yes	Yes	Yes

DWS's Blue Drop Process

The DWS completed the Blue Drop PAT process for the WSAs in 2021. Blue drop status is awarded to those towns that comply with 95% criteria on drinking water quality management. The blue drop performance of Overstrand Municipality is summarised as follows in the DWS's 2014 Blue Drop Report, which was the last complete assessment done by the DWS.

Table C.4.1.7: Blue Drop Performance of the Municipality (DWS's 2014 Blue Drop Report)	
Municipal Blue Drop Score	**2011 – 90.56%, 2012 – 96.82% and 2014 - 90.79%**

Regulatory Impression: The Overstrand Local Municipality team was well prepared and demonstrated their commitment to the Blue Drop assessment and water quality excellence. The Municipality is to be congratulated for obtaining Blue Drop status for the Greater Hermanus system. A decreased municipal score was however achieved during this assessment. The reason for the observed decrease in compliance includes:

- Full compliance with the requirements of SANS 241 with regard to monitoring and analysis could not be demonstrated. No chemical determinants have been analysed in the reticulation network to monitor the chemical quality of water provided to the consumer and identify any potential health impacts. In addition, the frequency of analysis does not comply with the requirements for the final water produced at treatment facilities receiving surface water or within the reticulation network. The Municipality however confirmed that subsequent to the assessment that a service provider has been appointed to implement a risk-based monitoring programme that fully complies with the requirements of SANS 241, sampler training and uploading of analytical data to the BDS.
- Detailed annual process audits could not be demonstrated that assessed the performance of the treatment systems and each process unit with the design capacity of the plant. Recommendations should be incorporated into the review process of water safety plan.
- Poor microbiological compliance was observed in the Baardskeerdersbos system. This should be mitigated when the new plant to treat borehole water is commissioned in August 2014.

Significant progress has been made by the municipality with regard to WC/WDM and projects have been ongoing for the last three years. Good baseline information and a formal strategy are available that enables the municipality to make informed decisions regarding ongoing planning to minimise non-revenue water.

It is anticipated that the identified gaps will be addressed by the Overstrand Local Municipality and that an upward trend towards Blue Drop compliance will once again be achieved in the next assessment.

Based on the Audit results, the DWS has serious concerns on the poor microbiological drinking water quality and the resultant risk to consumers of the Baardskeerdersbos water supply system. These concerns have to be addressed as a matter of urgency and drinking water quality results and appropriate actions must be communicated to consumers should the water be found to be unfit for human consumption.

Site Inspection (Preekstoel WTW (88%) and Buffels River WTW (90%)): The site inspection impression at the **Preekstoel WTW** was considered to be good. A number of drinking water quality management practices still require attention, including:

1. A flow chart was displayed of the incident management protocol that indicates roles and responsibilities but alert levels were not included.
2. Records of the results of the jar tests that are routinely undertaken could not be provided.
3. Emergency shower and eyewash facilities were not located at the chemical dosing room.
4. Manual post dosing of lime was being undertaken at the time of the assessment due to equipment failure. This was to be repaired as part of the maintenance contract with an external service provider. Standby equipment was not installed.
5. Standby chlorine dosing equipment is not installed.

The site inspection impression at the **Buffels River WTW** was considered to be good. A number of drinking water quality management practices still require attention, including:

1. A flow chart was displayed of the incident management protocol that indicates roles and responsibilities, but alert levels were not included.
2. The original O&M manual for the WTW is not available. Standard operating procedures have been compiled.
3. Records of jar tests undertaken by the service provider could not be provided.
4. Chemical tanks are not contained within a bounded area.
5. Standby chlorine dosing equipment is not installed.
6. Standby air compressor is not installed.

Performance Area	Baardskeerdersbos	Buffeljags Bay	Buffels River	Greater Gansbaai	Greater Hermanus	Kleinmond	Pearly Beach	Stanford
Water Services Provider(s)	Overstrand LM	Overstrand LM	Overstrand LM	Overstrand LM	Overstrand LM	Overstrand LM	Overstrand LM	Overstrand LM
Water Safety Planning	29.75	23.54	33.43	31.50	33.43	31.15	24.59	29.75
Treatment Process Management	4.28	5.60	4.00	6.80	8.00	6.40	6.80	4.70
DWQ Compliance	0.00	15.75	23.25	23.25	29.60	23.25	29.60	30.00
Management Accountability	8.95	8.20	9.25	9.25	9.25	9.25	9.25	9.25
Asset Management	8.72	9.24	11.03	10.50	11.90	10.29	10.29	11.38
Use Efficiency, Loss Management	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Bonus Scores	9.17	6.50	3.25	4.00	1.27	3.25	3.83	2.86
Penalties	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue Drop Score (2014)	**63.87%**	**71.83%**	**87.20%**	**88.30%**	**96.44%**	**86.59%**	**87.35%**	**90.94%**
Blue Drop Score (2012)	91.6%	93.8%	95.0%	97.1%	97.9%	95.0%	95.2%	92.7%
Blue Drop Score (2011)	93.7%	75.4%	95.1%	95.1%	87.2%	93.1%	94.3%	95.2%
Blue Drop Score (2010)	Not Assessed	Not Assessed	63.83%	63.81%	75.31%	60.06%	Not Assessed	Not Assessed
System Design Capacity (Ml/d)	0.150	0.100	5.500	7.100	28.000	5.800	1.400	1.500
Operational Capacity (% i.t.o. Design)	100%	105%	44%	100%	29%	39%	100%	57%
Average daily consumption (l/p/d)	655.0	310.3	803.4	445.9	192.4	230.1	1605.4	159.9
Microbiological Compliance (%)	**90.0%**	**95.5%**	**99.9%**	**99.9%**	**98.9%**	**99.9%**	**99.9%**	**99.9%**
Chemical Compliance (%)	**92.0%**	**99.9%**	**96.4%**	**96.1%**	**96.4%**	**96.4%**	**99.9%**	**96.4%**

Overstrand Municipality also received their 2022 Blue Drop Risk Ratings early this year, as calculated from the 2021 assessment done by the DWS.

Table C.4.1.8: BDRR for the Overstrand Municipality (2022)	
Municipal Blue Drop Risk Rating	**19.1%**

WSA Overview: All the Water Supply Systems (Baardskeerdersbos WSS, Buffeljags Bay WSS, Buffels River WSS, Greater Gansbaai WSS, Greater Hermanus WSS, Kleinmond WSS, Pearly Beach WSS and Stanford WSS) falls in the low-risk category.

Criteria A: The design capacities for all the Water Supply Systems were provided.

Criteria B: All the Water Supply Systems are operating within their design capacities.

Criteria C: All the Water Supply Systems achieved excellent compliance for Microbiological compliance (>98%), Microbiological Monitoring compliance (>80%), Chemical compliance (>98%) and Chemical Monitoring compliance (>80%), except Buffeljags Bay WSS which achieved adequate Chemical compliance of 92.3%

Criteria D: All the Water Supply Systems achieved excellent compliance (>90%) with technical skills which is an indication of relevant process controllers, supervisors and maintenance teams. However, Baardskeerdersbos WSS and Greater Gansbaai WSS have insufficient technical skills and this presents a risk with regards to operations and maintenance of these WSS.

Criteria E: All the Water Supply Systems achieved adequate compliance of 81.8% for Water Safety Planning and development of risk-based water quality monitoring programmes as outlined in SANS241:2015.

Table C.4.1.8: BDRR for the Overstrand Municipality (2022)								
Municipal Blue Drop Risk Rating								**19.1%**
The Regulator encourages the WSA and WSP to urgently implement the following recommendations to ensure delivery of safe drinking water for all consumers. • Implementation of corrective measures in the event of microbiological and chemical failures to always ensure delivery of safe drinking water. • Appointment of suitably qualified staff (supervisors, process controllers and maintenance teams) aligned to set criteria. • Development of Water Safety Plan as per SANS241:2015 and WHO guidelines including risk assessment of entire supply system, water quality evaluation based on full SANS 241:2015 analysis of raw and final water, development of risk-based monitoring programmes and implementation of mitigating measures to address all medium and high risks.								
Assessment Area	**Baardskeerdersbos**	**Buffeljags Bay**	**Buffels River**	**Greater Gansbaai**	**Greater Hermanus**	**Kleinmond**	**Pearly Beach**	**Stanford**
A: Total Design Capacity (Ml/d)	0.190	0.080	5.500	8.100	38.000	5.800	1.440	1.000
B: % Operational Capacity in terms of design	21.6%	12.8%	36%	43.8%	27%	39%	27.1%	86%
C1a: % Microbiological Compliance	100.0%	98.5%	100%	99.6%	100%	100%	100%	100%
C1b: % Microbiological Monitoring Compliance	100.0%	100%	100%	100%	100%	100%	100%	100%
C2a: % Chemical Compliance	99.5%	92.3%	97.7%	98.9%	99.3%	99.1%	99.3%	99.6%
C2b: % Chemical Monitoring Compliance	97.1%	97.1%	97.1%	97.1%	97.1%	97.1%	97.1%	97.1%
D: % Technical Skills	54.2%	91.7%	91.7%	91.7%	66.7%	91.7%	91.7%	91.7%
E: % Water Safety Plan Status	81.8%	81.8%	81.8%	81.8%	81.8%	81.8%	81.8%	81.8%
% BDRR / BDRR max	**12.8%**	**16.2%**	**16.7%**	**17%**	**20.7%**	**16.2%**	**13.9%**	**17.8%**

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

Table C.4.1.9: Average Residential Daily Consumption (l/p/d) for the Last Four Financial Years.												
Distribution System	**2019/2020**			**2020/2021**			**2021/2022**			**2022/2023**		
	Estimated Permanent Population	**Aver. Daily Billed Metered Res. Consump-tion (kl)**	**Aver. Daily consump-tion (l/p/d)**	**Estimated Permanent Population**	**Aver. Daily Billed Metered Res. Consump-tion (kl)**	**Aver. Daily consumption (l/p/d)**	**Estimated Permanent Population**	**Aver. Daily Billed Metered Res. Consump-tion (kl)**	**Aver. Daily consump-tion (l/p/d)**	**Estimated Permanent Population**	**Aver. Daily Billed Metered Res. Consump-tion (kl)**	**Aver. Daily consump-tion (l/p/d)**
Buffels River	3 180	797	**251**	3 312	852	**389**	3 449	931	**270**	3 593	893	**249**
Kleinmond	8 077	1 063	**132**	8 279	1 066	**129**	8 486	1 076	**127**	8 698	1 089	**125**
Greater Hermanus	67 054	6 376	**95**	70 038	6 368	**91**	73 154	7 113	**97**	76 410	7 067	**92**
Stanford	5 894	459	**78**	6 050	442	**73**	6 210	487	**78**	6 375	482	**76**
Greater Gansbaai	19 524	1 720	**88**	20 479	1 805	**88**	21 480	1 778	**83**	22 531	1 829	**81**
Pearly Beach	1 237	239	**193**	1 263	239	**189**	1 290	266	**206**	1 317	263	**200**
Baardskeerdersbos	127	20	**157**	128	17	**133**	128	19	**148**	129	19	**147**

Table C.4.1.9: Average Residential Daily Consumption (l/p/d) for the Last Four Financial Years.												
Distribution System	2019/2020			2020/2021			2021/2022			2022/2023		
	Estimated Permanent Population	Aver. Daily Billed Metered Res. Consump-tion (kl)	Aver. Daily consump-tion (l/p/d)	Estimated Permanent Population	Aver. Daily Billed Metered Res. Consump-tion (kl)	Aver. Daily consumption (l/p/d)	Estimated Permanent Population	Aver. Daily Billed Metered Res. Consump-tion (kl)	Aver. Daily consump-tion (l/p/d)	Estimated Permanent Population	Aver. Daily Billed Metered Res. Consump-tion (kl)	Aver. Daily consump-tion (l/p/d)
Buffeljags Bay	153	8	**52**	154	7	**45**	155	6	**39**	155	7	**45**
All Systems	**105 246**	**10 682**	**101**	**109 703**	**10 796**	**98**	**114 352**	**11 676**	**102**	**119 208**	**11 649**	**98**

Note: The average residential billed metered consumption in the above table is for the period July to June each financial year, excluding the period November to February.

DWS's Green Drop Process

The DWS completed the new Green Drop assessment for the WSAs in 2021 and the results were received early in 2022. Green drop status is awarded to those WSAs that comply with 90% criteria on key selected indicators on wastewater quality management. The green drop performance of Overstrand Municipality is summarised as follows in the DWS's 2022 Green Drop Report.

Table C.4.1.10: Green Drop Performance of the Municipality (DWS's 2022 Green Drop Report)	
Average Green Drop Score	**2009 – 63.0%, 2011 – 89.0%, 2013 – 89.0%, 2021 – 89.0%**

Regulatory Impression: Overstrand Municipality and WSP Veolia delivered a sterling performance that was awarded with an overall 89% Green Drop score. The municipality continues to maintain a remarkable record of 89% over 10 years, marked by a committed, competent team. In addition, Gansbaai, Hermanus and Stanford were serious contenders for Green Drop Certification, which regrettably had to be waived due to not achieving excellent standards (>90%) on their final microbiological and/or chemical qualities. The WSA should be able to attain Certification status in 2023 if this matter can be resolved.

The Regulator is impressed with the level of preparation and professional conduct during the audit, represented by managers in various roles, supported by Veolia Water. All required information was loaded onto IRIS for various KPAs prior which ensure a seamless preliminary assessment. The team then used the main audit and verification audit events to maximise their scores by providing clarification and further evidence on sludge classification (landfilling), stormwater- and water demand management and capital projects. The striking performance and sustained services are not surprising if noting the strength of the engineering, technical, scientific, and laboratory competence, supported by committed senior management and municipal leadership. Perfect score (100%) was achieved for KPA Capacity Management for the expertise, supported by comprehensive operation, maintenance and monitoring plans and records, including financials and energy management. Human capacity is optimised via the adoption of automation and telemetry. This aspect must be taken up with the Regulator to align with capacity requirements to ensure that any risks associated with such innovations are managed. Flow monitoring is in place for inflow and outflow, and online monitoring for night flows (Mycity) is in place. Energy optimisation via LED is standard procedure and CO_2 equivalents are calculated to monitor the benefit. Well done. These best practices set a high standard for wastewater services in South Africa.

In a nutshell, the municipality performance exceptionally well in all KPA (>90%), with the exception of Effluent and Sludge Compliance. Areas for improvement include the laboratory turn-around time, monitoring of dedicated sludge streams and performance evaluation against design expectations, flow meter calibration / verification, sludge classification according to the WRC guidelines (noting new landfill regulations).

The adoption of site specific W_2RAP process is an encouraging; notably that risk management is informed and influenced by a process audit, sewer master plan and supported by budget for implementation. Improvement should focus on having (independent) Risk Reviews every 6 months to monitor (quantify) risk movement. The Regulator congratulates Overstrand and hope the 2023 audit cycle will result in an exponential improvement until Green Drop excellence is achieved for all six systems.

Table C.4.1.10: Green Drop Performance of the Municipality (DWS's 2022 Green Drop Report)

Green Drop Findings:

1. All WWTW achieved a full score for capacity management, thereby verifying the availability of registered and qualified process controllers, maintenance teams (inhouse and outsourced services), engineering, technical (technicians and technologists) and scientific expertise tied to wastewater management and asset planning.
2. W_2RAPs are in place and implemented and its impact monitored through operational monitoring and compliance monitoring.
3. All systems presented financial evidence viz. allocated budgets and expenditure, treatment cost (R/m³ treated), energy costs (R/kWh) and contracts for external services.
4. Six of six WWTWs logged full records for compliance monitoring, including biomonitoring.
5. Operational monitoring with online meters for most process streams are implemented. Gaps are still noted with regard to sludge monitoring of dedicated streams, e.g. in and output from settlers and thickeners, anaerobic digesters, belt presses, drying beds, etc.
6. High quality reports were presented for process audits, sewage inspection reports and sewer master planning.
7. Bylaws are updated and enforced.
8. Twelve months of data uploaded on IRIS for all six WWTWs, supported by relevant site-specific water use authorisation and general authorisations.
9. Sludge classification for landfill disposal is done, but not complemented by WRC classification – the latter not only intending to guide disposal but also to monitor the quality of biosolids produced by the site.
10. No penalties and no directives were issued for any systems.
11. No plants in the critical or high-risk positions.
12. Capital projects are part of a three-year plan, with 2021 projects listed as follows:
    - R6 700 000: Sewer network extension in Gansbaai WWTWs and associated infrastructure
    - R16 154 000: Hawston WWTW refurbishment on civil and mechanical equipment's for various unit processes.
    - R8 836 000: Hermanus WWTW refurbishments and associated infrastructure.
    - R1 645 000: Kleinmond WWTW refurbishments and associated infrastructure.
    - R1 797 000: Stanford WWTW refurbishments and associated infrastructure.

The Hermanus WWTW was inspected to verify the Green Drop audit findings (**Technical Site Assessment for the Hermanus WWTW 74%)**:

- The network and pumpstation was in good condition, noticed for routine maintenance and adequate response to sewage blockages.
- Trespassing seems to be a risk at the WWTW, compounded by land invasion close to the site. Neighbours to the WWTW resort to jumping over the fence to access their residence. Overstrand has plans to raise the wall to secure the facility and mitigate security risks.
- Plant infrastructure is aging; however, its lifespan is extended via preventative maintenance strategies. All equipment is functional.
- The site office displays certificates for PCs and WWTW – a satisfactory working environment is observed.
- Operational monitoring, daily logbook or maintenance records were in place.
- Safety signs were displayed at various unit processes i.e., chlorination, belt presses, lime storage, reactors, etc.
- Parts of the site was untidy and not evident of good groundskeeping - used as storage whilst network upgrades/refurbishments underway. Good housekeeping was evident at the maturation ponds.
- Sludge drying beds were not well kept and used only during emergency. Belt presses are used for primary sludge handling.
- Veolia Water developed a reactor control- and sludge management plan.
- All required documents were presented on site including comprehensive O&M manual with manufacturers specs, PFD and model of plant, and record of all maintenance issues (job cards, works orders, tracking of outstanding jobs).

Key Performance Area	Weight	Gansbaai	Hawston	Hermanus	Kleinmond	Pearly Beach	Stanford
A: Capacity Management	15%	100%	100%	100%	100%	100%	100%
B: Environmental Management	15%	91.0%	85.0%	85.0%	86.0%	98.8%	92.0%
C: Financial Management	20%	98.0%	98.0%	98.0%	78.0%	97.5%	98.0%
D: Technical Management	20%	97.5%	97.5%	97.5%	93.5%	97.1%	97.5%
E: Effluent & Sludge Management	30%	70.0%	50.0%	85.0%	64.0%	62.5%	50.0%
F: Bonus		94.0%	94.0%	94.0%	94.0%	56.0%	94.0%
G: Penalties		0.0%	0.0%	0.0%	0.0%	-25.0%	0.0%
H: Disqualifiers		None	None	None	None	None	None
2021 Green Drop Score		**89% - 96%**	**89%**	**89% - 96%**	**88%**	**88%**	**89% - 90%**
2013 Green Drop Score		**92%**	**90%**	**91%**	**78%**	**NA**	**93%**
2011 Green Drop Score		**76%**	**88%**	**92%**	**83%**	**NA**	**83%**
2009 Green Drop Score		**66%**	**57%**	**66%**	**66%**	**NA**	**61%**
System Design Capacity (Ml/d)		2.000	1.000	12.000	2.000	0.259	1.200
Design Capacity Utilisation (%)		43%	61%	54%	76%	31%	89%
Resource Discharged into		Irrigation Sports Complex	Maturation Pond into Wetland	Ocean	Reed-bed / wetland area lined to sea	An aquifer	Constructed reed bed to Klein River
Microbiological Compliance (%)		68%	80%	87%	91%	100%	82%
Chemical Compliance (%)		86%	74%	98%	51%	58%	78%
Physical Compliance (%)		95%	62%	100%	88%	27%	82%
Wastewater Risk Rating (CRR% of CRR max)							
2011 CRR (%)		**31.0%**	**33.0%**	**35.0%**	**44.0%**	**NA**	**44.0%**
2013 CRR (%)		**35.3%**	**29.0%**	**45.0%**	**47.0%**	**NA**	**29.0%**
2021 CRR (%)		**41.2%**	**52.9%**	**36.4%**	**47.1%**	**52.9%**	**64.7%**

C.4.2. Water Quality Compliance

The table below gives an overview of Overstrand Municipality's water quality compliance, as taken from the IRIS.

Table C.4.2.1: Overview of Water Quality Compliance

WSDP Ref #	Measurable / Enabling Factor	Unit	Year 0 FY2022/23						Year -1 FY2021/22						Year -2 FY2020/21					
			MAH	CAH	CCH	CNA	O	D	MAH	CAH	CCH	CNA	O	D	MAH	CAH	CCH	CNA	O	D
	Results per the Integrated Regulatory Information System																			
n/a	Analysis compliance	Total	1192	76	2487	3382	4344	1138	985	76	2287	3261	3900	904	982	0	1873	3377	4145	838
n/a		Nr Failures	8	0	8	44	147	22	10	0	2	32	74	25	3	0	1	41	74	795
n/a		Compliance %	99%	100%	100%	99%	97%	98%	99%	100%	100%	99%	98%	97%	100%	0%	100%	99%	98%	5%
n/a	Samples frequency	Total	1154	19	1170	996	1352	1119	928	19	922	929	942	886	982	0	975	989	1007	838
n/a		Nr Failures	485	9	502	281	543	456	258	9	256	259	264	220	236	0	231	219	237	204
n/a		Compliance %	58%	53%	57%	72%	60%	59%	72%	53%	72%	72%	72%	75%	76%	0%	76%	78%	76%	76%
n/a	Sites compliance	Total	453	19	454	454	457	450	449	19	447	449	449	446	544	0	540	556	557	454
n/a		Nr Failures	107	9	108	108	108	106	106	9	106	106	106	105	108	0	108	107	108	106
n/a		Compliance %	76%	53%	76%	76%	76%	76%	76%	53%	76%	76%	76%	76%	80%	0%	80%	81%	81%	77%
6.3	**Water Supply and Quality**																			
6.3.6	Blue Drop Status	last year certified by DWS	2022 Blue Drop Assessment (Waiting for results)						2021 Blue Drop PAT						No Blue Drop assessment was done by DWS					
9.3	**Water Quality**																			
9.3.10	% Time (days) within SANS 241 standards per year	Average of analysis compliance %	99%						99%						67%					

Legend **MAH**: Microbiological Acute Health; **CAH**: Chemical Acute Health; **CCH**: Chemical Chronic Health; **CNA**: Chemical Non Health Aesthetic; **O**: Operational; **D**: Disinfectant

Information not correct in IRIS, ongoing discussions with DWS. Compliance data sometimes to be re-submitted due to techical problems at IRIS, which result in low sample frequency and site compliance percentages.

The Table below gives an overview of the number of compliance samples taken over the period July to June for the last two financial years for the various water distribution networks.

Table C.4.2.2: Number of Water Quality Compliance Samples Taken Throughout the Various Water Distribution Systems Over the Period July to June for the Last Two Financial Years

Number of Sampling points within the distribution system (WTW Included)	5		3		9		3		7		3		3		2	
Parameter Sampled	**Buffels River**		**Kleinmond**		**Greater Hermanus**		**Stanford**		**Greater Gansbaai**		**Pearly Beach**		**Baards-keerdersbos**		**Buffeljags Bay**	
	22/23	**21/22**	**22/23**	**21/22**	**22/23**	**21/22**	**22/23**	**21/22**	**22/23**	**21/22**	**22/23**	**21/22**	**22/23**	**21/22**	**22/23**	**21/22**
pH (at 25°C)	129	143	77	80	259	238	73	76	213	213	76	73	80	79	50	50
Conductivity	58	47	40	39	123	93	49	56	137	129	52	50	43	40	38	40
Turbidity	167	132	76	82	262	238	73	79	204	212	82	73	114	79	50	50
Colour	110	116	40	35	245	222	39	45	210	202	76	74	43	41	26	30
Iron (as Fe)	109	114	20	21	258	237	6	6	42	32	53	48	99	74	25	30
Aluminium (as Al)	126	136	77	82	247	220	6	6	198	184	78	73	4	8	3	4
E.Coli	149	129	102	82	295	238	101	77	280	222	103	74	108	73	79	50
Total Coliform Bacteria	72	47	43	36	133	116	45	48	144	125	45	43	45	41	30	31
Heterotrophic Plate Count	156	130	104	82	305	237	108	78	301	227	114	75	133	85	80	51
Somatic Coliphages	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Free Chlorine	148	129	102	81	283	202	100	76	267	221	101	71	104	75	77	50
Cadmium (as Cd)	2	1	2	2	2	3	3	3	4	3	2	2	2	2	2	2
Total Organic Carbon	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Nitrate	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Nitrite	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Total Alkalinity	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	-
Calcium Hardness	15	16	16	17	18	36	73	71	40	33	12	12	16	10	12	12
Calcium	11	-	10	-	12	-	30	-	22	-	11	-	11	-	11	-
Total Hardness	15	16	17	17	18	36	76	74	44	35	12	12	16	10	12	12
Magnesium Hardness	15	16	16	17	18	36	67	69	38	33	12	11	16	10	12	12
Magnesium (as Mg)	11	-	10	-	12	-	30	-	22	-	11	1	11	-	11	-

Table C.4.2.2: Number of Water Quality Compliance Samples Taken Throughout the Various Water Distribution Systems Over the Period July to June for the Last Two Financial Years																
Number of Sampling points within the distribution system (WTW Included)	5		3		9		3		7		3		3		2	
Parameter Sampled	**Buffels River**		**Kleinmond**		**Greater Hermanus**		**Stanford**		**Greater Gansbaai**		**Pearly Beach**		**Baards-keerdersbos**		**Buffeljags Bay**	
	22/23	**21/22**	**22/23**	**21/22**	**22/23**	**21/22**	**22/23**	**21/22**	**22/23**	**21/22**	**22/23**	**21/22**	**22/23**	**21/22**	**22/23**	**21/22**
Fluoride (as F)	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Total Dissolved Solids	2	1	2	2	13	3	3	3	4	4	2	2	2	2	2	2
Manganese (as Mn)	64	98	4	3	263	237	6	6	29	20	4	4	119	71	3	5
Sodium (as Na)	2	1	2	2	2	3	3	3	15	4	2	2	2	2	2	2
Potassium (as K)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Chloride	2	1	2	2	2	3	3	3	4	4	2	2	2	2	24	2
Sulphate (as SO4)	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Ammonium	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Nitrate/Nitrite Nitrogen	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Nickel (as Ni)	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Copper (as Cu)	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Chromium (as Cr)	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Lead (as Pb)	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Cyanide	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Arsenic (as As)	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Mercury (as Hg)	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Selenium (as Se)	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Antimony (as Sb)	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Total THM Ratio (Calc)	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Phenols	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Chloroform	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Bromoform	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Dibromochloromethane	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Bromodichloromethane	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Uranium (as U)	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Cryptosporidium Species	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Giardia Species	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Monochloramine	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Microcystins	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Barium	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Boron	2	1	2	2	2	3	3	3	4	4	2	2	2	2	2	2
Total number of samples	**1 425**	**1 304**	**824**	**744**	**2 843**	**2 491**	**997**	**872**	**2 342**	**2 027**	**912**	**764**	**1 032**	**766**	**611**	**497**

The water quality of all the water distribution systems in Overstrand Municipality is "Excellent", according to the SANS 241:2015 classification. The water quality compliance sample results are included in Annexure D for each of the water distribution systems. The overall percentage of compliance of the water quality samples taken over the period July to June for the last two financial years is summarised in the table below per distribution system. The additional monitoring required by Overstrand Municipality for determinands identified during the risk assessment exceeding the SANS 241:2015 numerical limits are also included in the table.

Table C4.2.3: Percentage Compliance of the Water Quality Samples for the Last Two Financial Years						
Performance Indicator	Performance Indicator categorised as unacceptable Yes / No (Table 4 of SANS 241-2:2015)		% Sample Compliance according to SANS 241-2015 Limits		Frequency of Additional Monitoring due to failure (Table 3 of SANS 241-2:2015)	
	22/23	21/22	22/23	21/22	22/23	21/22
Buffels River						
Acute Health Microbiological	No (Excellent)	No (Excellent)	99.3%	100.0%	-	-
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Chronic Health	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Aesthetic	No (Excellent)	No (Excellent)	99.8%	99.8%	-	-
Operational Efficiency	Yes (Unacceptable)	No (Excellent)	89.7%	93.9%	Monthly	-
Kleinmond						
Acute Health Microbiological	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Chronic Health	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Aesthetic	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Operational Efficiency	No (Excellent)	No (Excellent)	98.2%	98.9%	-	-
Greater Hermanus						
Acute Health Microbiological	No (Excellent)	No (Excellent)	100.0%	98.8%	-	-
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Chronic Health	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Aesthetic	No (Excellent)	No (Excellent)	99.5%	99.6%	-	-
Operational Efficiency	No (Excellent)	No (Excellent)	98.4%	99.1%	-	-
Stanford						
Acute Health Microbiological	No (Excellent)	No (Excellent)	99.1%	98.8%	-	-
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Chronic Health	No (Excellent)	No (Excellent)	99.4%	100.0%	-	-
Aesthetic	No (Excellent)	No (Excellent)	100.0%	99.5%	-	-
Operational Efficiency	No (Excellent)	No (Excellent)	97.0%	97.2%	-	-
Greater Gansbaai						
Acute Health Microbiological	No (Excellent)	No (Excellent)	99.3%	98.7%	-	-
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Chronic Health	No (Excellent)	No (Excellent)	99.8%	99.7%	-	-
Aesthetic	No (Excellent)	No (Excellent)	100.0%	99.8%	-	-
Operational Efficiency	No (Excellent)	No (Excellent)	97.1%	98.4%	-	-
Pearly Beach						
Acute Health Microbiological	No (Excellent)	No (Excellent)	99.1%	98.7%	-	-
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Chronic Health	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Aesthetic	No (Excellent)	No (Excellent)	100.0%	98.5%	-	-
Operational Efficiency	No (Excellent)	No (Excellent)	94.9%	98.8%	-	-
Baardskeerdersbos						
Acute Health Microbiological	No (Excellent)	No (Excellent)	99.1%	98.7%	-	-
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Chronic Health	No (Excellent)	No (Excellent)	97.3%	99.2%	-	-
Aesthetic	No (Excellent)	No (Excellent)	94.9%	99.1%	-	-
Operational Efficiency	No (Excellent)	No (Good)	93.3%	90.8%	-	-

Table C4.2.3: Percentage Compliance of the Water Quality Samples for the Last Two Financial Years						
Performance Indicator	Performance Indicator categorised as unacceptable Yes / No (Table 4 of SANS 241-2:2015)		% Sample Compliance according to SANS 241-2015 Limits		Frequency of Additional Monitoring due to failure (Table 3 of SANS 241-2:2015)	
	22/23	21/22	22/23	21/22	22/23	21/22
Buffeljags Bay						
Acute Health Microbiological	No (Excellent)	No (Excellent)	97.6%	100.0%	-	-
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Chronic Health	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Aesthetic	Yes (Unacceptable)	No (Excellent)	87.0%	95.3%	Quarterly	-
Operational Efficiency	No (Excellent)	No (Excellent)	97.8%	94.1%	-	-

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

Table C.4.2.4: Four Categories under which the Risks Posed by Micro-organism, Physical or Aesthetic Property or Chemical Substance of Potable Water is Normally Classified	
Category	**Risk**
Acute Health	Determinand that poses an immediate unacceptable health risk if present at concentration values exceeding the numerical limits specified in this part of SANS 241.
Aesthetic	Determinand that taints water with respect to taste, odour and colour and that does not pose an unacceptable health risk if present at concentration values exceeding the numerical limits specified in SANS 241.
Chronic Health	Determinand that poses an unacceptable health risk if ingested over an extended period if present at concentration values exceeding the numerical limits specified in SANS 241.
Operational	Determinand that is essential for assessing the efficient operation of treatment systems and risks from infrastructure

The recommendations from the detail WTW Process Audits (June 2022), as completed during the 2021/2022 financial year, are summarised in the table below.

Table C.4.2.5 Recommendations from the detail WTW Process Audits	
WTW	**Recommendation**
Buffels River	• Formalise soda ash dosing configuration. • Expedite repairs to the inlet flowmeter. • Monitor and record turbidity values for the individual settling tanks and continue to optimise the operation of this Process Unit. • Record actual “Filter-to-waste” durations. • Perform Specific Deposit determination on filter media. • Investigate underdrain system of filtration. Re-install nozzles in a more secure manner. • Monitor and record turbidity values for the individual filters and continue to optimise the operation of this Process Unit. • Install a formal, fixed treated water sampling point. • A formal plan for dealing with a chlorine leak needs to be developed, it seems like there is no safe way in which to ventilate the area. • Current stacking practices related to cylinders needs to be addressed, both full and empty cylinders should be securely chained. It is furthermore ideal to have demarcated areas for these. • There should be 30 days’ stock on site. • Another full-face mask should be provided. Ideally, every process controller should have his/her own one. • Having spare chlorine connector lines, “pigtails”, on site is always advisable. • Ensure all the required information is captured, i.e., ensure the turbidity values from the individual settling tanks are recorded.
Kleinmond	• Provide standby Flocculant Dosing Pump. • Monitor and record turbidity values for the individual settling tanks and continue to optimise the operation of this Process Unit. • Provide flow control to the individual settling tank inlets (currently isolation sluice gates are provided). • Control flow to the filters as to ensure they are equally loaded. • Install a second Backwash Pump & Blower. • Theoretically, the plant should be able to cope with only two filters in operation. • Perform Specific Deposit determination on filter media. • Current stacking practices related to cylinders needs to be addressed, both full and empty cylinders should be securely chained. It is furthermore ideal to have demarcated areas for these.

Table C.4.2.5 Recommendations from the detail WTW Process Audits	
WTW	**Recommendation**
	• There should be 30 days stock on site. • Another full-face mask should be provided. Ideally, every process controller should have his/her own one. • Having spare chlorine connector lines, “pigtails”, on site is always advisable. • Capture the units being used in the logbook – there is, as an example, no indication of the unit in which flow is measured. • Monitor (and record) turbidity values for the individual settling tanks in order to optimise the operation of this Process Unit.
Preekstoel	• Clean off some of the residue that forms on the dosing points. • Monitor and record turbidity values for the individual settling tanks and continue to optimise the operation of this Process Unit. • Consider moving the inlet to the centre of the distribution box as to establish better flow distribution between the two basins. • Control flow to the filters as to ensure they are equally loaded. • Monitor and record turbidity values for the individual filters in order to optimise the operation of this Process Unit. • Theoretically, the plant should be able to cope with only two filters per bank in operation. • Perform Specific Deposit determination on filter media. • There should be 30 days stock on site. • Having spare chlorine connector lines, “pigtails”, on site is always advisable. • Monitor and record turbidity values for the individual Process Units. • Ensure Process Controllers are aware of the Preventative Maintenance Schedule. • Ensure records / logbooks pertaining to preventative maintenance are also available on site. • Start sensitising Process Controllers to take more responsibility for aspects related to risk management pertaining to the operation of the Works.
Stanford	• Maintenance of membranes are crucial, ensure all schedules are adhered to. • Ensure spare membranes are available, either on site or in storage. • Ensure a standby RO Feed Pump is available in storage (Only a duty pump is currently installed). • Ensure maintenance of dosing pumps are scheduled. • Closely monitor residual chlorine levels. Maintain a balance between providing additional residual protection in the network and raising levels to appoint where a “chlorine taste and smell” become evident to consumers.
Franskraal	• Connect (electrically) the standby Flocculant Dosing Pump. • Formalise the flocculant dosing point. • Monitor and record turbidity values for the individual settling tanks in order to optimise the operation of this Process Unit. • Control flow to the filters as to ensure they are equally loaded. • Theoretically, the plant should be able to cope with only two filters in operation. • Perform Specific Deposit determination on filter media. • Current stacking practices related to cylinders needs to be addressed, both full and empty cylinders should be securely chained. It is furthermore ideal to have demarcated areas for these. • There should be 30 days stock on site. • Another full-face mask should be provided. Ideally, every process controller should have his/her own one. • Repair the chlorine scales. • Ensure all the required information is captured, i.e., ensure the turbidity values from the individual filters are recorded.
De Kelders	• Maintenance of membranes are crucial, ensure all schedules are adhered to. • Ensure spare membranes are available, either on site or in storage. • Ensure maintenance of dosing pumps are scheduled. • Provide a containment barrier around the dosing station to prevent any spillages or leaks from becoming a hazard to plant personnel. • Closely monitor residual chlorine levels. Maintain a balance between providing additional residual protection in the network and raising levels to appoint where a “chlorine taste and smell” become evident to consumers.
Pearly Beach	• Ensure sludge disposal records are kept. • Maintenance of membranes are crucial, ensure all schedules are adhered to. • Ensure spare membranes are available, either on site or in storage. • Ensure maintenance of dosing pumps are schedules. • A general clean-up of the area would be advisable. • Provide a containment barrier around the dosing station to prevent any spillages or leaks from becoming a hazard to plant personnel. • Closely monitor residual chlorine levels. Maintain a balance between providing additional residual protection in the network and raising levels to a point where a “chlorine taste and smell” become evident to consumers.
Baardskeerdersbos	• Should deficiencies in the removal of manganese be noted, determine the concentration or organic

Table C.4.2.5 Recommendations from the detail WTW Process Audits	
WTW	**Recommendation**
	compounds in the raw water. • Automate desludging of the second settler. • Ensure sludge disposal records are kept. • Ensure water quality results from the sludge drainage water, flowing back into the natural water course, are kept on site. • Maintenance of membranes are crucial, ensure all schedules are adhered to. • Ensure spare membranes are available, either on site or in storage. • Ensure maintenance of dosing pumps are schedules. • A general clean-up of the area would be advisable. • Provide a containment barrier around the dosing station to prevent any spillages or leaks from becoming a hazard to plant personnel. • Closely monitor residual chlorine levels. Maintain a balance between providing additional residual protection in the network and raising levels to a point where a "chlorine taste and smell" become evident to consumers.
Buffeljags Bay	• Ensure monitoring is done in accordance with SANS241:2015 – Table 1
All WTWs	• Ensure spreadsheet is being kept up to date and not only populated once a month. • Process Controllers to interact with the data collected on site, draw graphs etc. to track operational changes (quality & quantities). • Process Controllers should receive feedback from both the internal lab and the independent laboratory. • The calibration of the equipment used on site should be verified by the internal lab. • Consider expanding the spreadsheet to provide operational feedback and not act as database only. • The inclusion of Electrical Conductivity in the daily testing is a requirement stipulated in SANS241:2015 – Table 1 and needs to be included. • Ensure Process Controllers are aware of the Preventative Maintenance Schedule. • Ensure records / logbooks pertaining to preventative maintenance are also available on site. • Start sensitising Process Controllers to take more responsibility for aspects related to risk management pertaining to the operation of the Works.

The table below gives an overview of the overall wastewater quality compliance, as taken from the IRIS.

Table C.4.2.6: Overview of Wastewater Quality Compliance															
WSDP Ref #	**Measurable / Enabling Factor**	**Unit**	**Year 0 FY2022/23**				**Year-1 FY2021/22**				**Year-2 FY2020/21**			
			M	**C**	**P**	**O**	**M**	**C**	**P**	**O**	**M**	**C**	**P**	**O**
	Results per the Integrated Regulatory Information System													
n/a	Regulatory compliance	Total	119	330	301	-	92	244	282	-	30	76	102	-
n/a		Nr Failures	38	167	96	-	12	92	65	-	7	20	25	-
n/a		Compliance %	68%	49%	68%	-	87%	62%	77%	-	77%	74%	75%	-
n/a	Operational compliance	Total	Not captured on IRIS, but recorded by Process Controllers at each of the WWTW											
n/a		Nr Failures												
n/a		Compliance %												
5.3.1	**Monitoring and Sample Failure**													
5.3.1.3 5.3.1.4 5.3.1.5	Average % of sample failure	Failure %	32%	51%	32%	-	13%	38%	23%	-	23%	26%	25%	NA
6.3	**Water Supply and Quality**													
6.4.6	Green Drop Status	last year certified by DWS	2022 Green Drop PAT (Waiting for results)				2021 Green Drop Assessment				No Green Drop assessment was done by DWS			

Legend **M**: Microbiological; **C**: Chemical; **P**: Physical; **O**: Operational

The final effluent quality complies with the authorised Microbiological, Chemical and Physical limits for most of the WWTWs. The final effluent quality compliance sample results are included in Annexure D for each of the WWTWs. The overall Microbiological, Chemical and Physical compliance percentages of the final effluent samples taken over the last three financial years at the Kleinmond-, Hawston-, Hermanus-, Stanford-, Gansbaai and Pearly Beach WWTW are summarised in the tables below.

Table 4.2.7: Percentage Microbiological (Faecal Coliforms) Compliance of the Compliance Samples Taken at the Various WWTWs for the Last Three Financial Years

WWTW	2022/2023	2021/2022	2020/2021
Kleinmond	91.7%	91.7%	100.0%
Hawston	100.0%	91.7%	100.0%
Hermanus	91.7%	75.0%	100.0%
Stanford	33.3%	91.7%	100.0%
Gansbaai	16.7%	50.0%	100.0%
Pearly Beach	83.3%	100.0%	100.0%
All WWTWs	**69.4%**	**83.3%**	**100.0%**

Note: Where parameters were resampled, due to failures, the resampled results were used to calculate the above compliance percentages.

Table 4.2.8: Percentage Chemical Compliance of the Compliance Samples Taken at the Various WWTWs for the Last Three Financial Years

WWTW	2022/2023					2021/2022					2020/2021				
	Ammonia	Nitrites & Nitrates	COD	Ortho Phosphate	Overall	Ammonia	Nitrites & Nitrates	COD	Ortho Phosphate	Overall	Ammonia	Nitrites & Nitrates	COD	Ortho Phosphate	Overall
Kleinmond	16.7%	100.0%	0.0%	100.0%	**54.2%**	16.7%	100.0%	33.3%	100.0%	**62.5%**	8.3%	100.0%	66.7%	100.0%	**68.8%**
Hawston	33.3%	100.0%	16.7%	66.7%	**54.2%**	25.0%	100.0%	33.3%	75.0%	**58.3%**	83.3%	100.0%	75.0%	100.0%	**89.6%**
Hermanus	83.3%	83.3%	100.0%	91.7%	**89.6%**	91.7%	100.0%	91.7%	100.0%	**95.8%**	100.0%	100.0%	100.0%	100.0%	**100.0%**
Stanford	91.7%	100.0%	100.0%	100.0%	**97.9%**	100.0%	100.0%	100.0%	100.0%	**100.0%**	91.7%	100.0%	91.7%	100.0%	**95.8%**
Gansbaai	41.7%	66.7%	66.7%	91.7%	**66.7%**	66.7%	66.7%	100.0%	91.7%	**81.3%**	100.0%	91.7%	100.0%	100.0%	**97.9%**
Pearly Beach	91.7%	100.0%	0.0%	100.0%	**72.9%**	91.7%	100.0%	0.0%	100.0%	**72.9%**	58.3%	100.0%	0.0%	83.3%	**60.4%**
All WWTWs	**59.7%**	**91.7%**	**47.2%**	**91.7%**	**72.6%**	**65.3%**	**94.4%**	**59.7%**	**94.4%**	**78.5%**	**73.6%**	**98.6%**	**72.2%**	**97.2%**	**85.4%**

Note: Where parameters were resampled, due to failures, the resampled results were used to calculate the above compliance percentages.

Table 4.2.9: Percentage Physical Compliance of the Compliance Samples Taken at the Various WWTWs for the Last Three Financial Years

WWTW	2022/2023				2021/2022				2020/2021			
	pH	Electrical Conductivity	Total Suspended Solids	Overall	pH	Electrical Conductivity	Total Suspended Solids	Overall	pH	Electrical Conductivity	Total Suspended Solids	Overall
Kleinmond	100.0%	100.0%	50.0%	**83.3%**	100.0%	91.7%	83.3%	**91.7%**	100.0%	91.7%	83.3%	**91.7%**
Hawston	91.7%	50.0%	75.0%	**72.2%**	100.0%	25.0%	75.0%	**66.7%**	100.0%	16.7%	100.0%	**72.2%**
Hermanus	100.0%	100.0%	100.0%	**100.0%**	100.0%	100.0%	100.0%	**100.0%**	100.0%	100.0%	100.0%	**100.0%**
Stanford	100.0%	83.3%	100.0%	**94.4%**	100.0%	91.7%	100.0%	**97.2%**	100.0%	66.7%	100.0%	**88.9%**
Gansbaai	100.0%	75.0%	91.7%	**88.9%**	100.0%	100.0%	100.0%	**100.0%**	100.0%	83.3%	100.0%	**94.4%**
Pearly Beach	50.0%	25.0%	0.0%	**25.0%**	91.7%	50.0%	8.3%	**50.0%**	75.0%	0.0%	25.0%	**33.3%**
All WWTWs	**90.3%**	**72.2%**	**69.4%**	**77.3%**	**98.6%**	**76.4%**	**77.8%**	**84.3%**	**95.8%**	**59.7%**	**84.7%**	**80.1%**

Note: Where parameters were resampled, due to failures, the resampled results were used to calculate the above compliance percentages.

Power outages through load shedding have been at the worst level ever during the 2022/23 financial year, and had the following negative impacts on the treatment processes at the WWTWs and the compliance of the final effluent:

- Pumps and telemetry devices cannot always be operated during load shedding periods;
- Treatment stops and sewage flows cannot be controlled, which also negatively impact the compliance of the final effluent discharged from the WWTWs; and
- Equipment damage costs, back-up generators costs, increased labour costs and increased pump start-up costs.

The recommendations from the detail WWTW Process Audits (June 2022), as completed during the 2021/2022 financial year, are summarised in the table below.

Table C.4.2.10: Recommendations from the detail WWTW Process Audits

WWTW	Recommendation
Kleinmond	• Install outlet flowmeter. • Control the MLSS concentration at around 3 500 mg/l by daily wasting. • Monitor and maintain alkalinity above 500 mg/l. • Gather data on peak flows to better understand the effect these have on clarifier performance. • Complete installation of new dosing pump (Disinfection). • Manager (or independent laboratory's sampler) to conduct random residual chlorine and/or microbiological sampling to verify disinfection. • Run the press 6.5 hours per day, every day. • Allow Sludge Lagoons to dry out and start with the cleaning of these as to create spare capacity should the press be out of order for an extended period. • Ensure spreadsheet is being kept up to date and not only populated once a month. • Process Controllers to interact with the data collected on site - draw graphs etc. to track operational changes (quality & quantities). • Process Controllers should receive feedback from both the internal lab and the independent laboratory. • The calibration of the equipment used on site should be verified by the internal lab. • Consider expanding the spreadsheet to provide operational feedback and not act as database only. • Ensure Process Controllers are aware of the Preventative Maintenance Schedule. • Ensure records / logbooks pertaining to preventative maintenance are also available on site. • Start sensitising Process Controllers to take more responsibility for aspects related to risk management pertaining to the operation of the Works.
Hawston	• As there is no grit removal prior to the transfer pumpstation scheduled cleaning of the sump should be prioritised. • Look into ways of reducing the concentrated velocity onto the Head of Works screen. • Provide a dedicated area for vacuum tanker discharge / secure the operation by providing a built-in quick-couple connection for discharge (eliminate the need to open and close the manhole). As an interim measure, ensure the team follows a Standard Operating Procedure which includes securing the area while they are working and ensure the manhole cover is replaced once they leave. • Reduce the MLSS concentration to no more than 3 500 mg/l and then maintain these levels by daily wasting. • Measure alkalinity and ensure it remains in excess of 871 mg/l. • Install standby dosing pump / ensure standby unit is available (in safe storage) for quick installation should the need arise. • Running the press 12 hours per day, every day. • Clean the drying beds and prepare them for use. Should they be required on a regular basis one could consider laying some bricks with holes in them onto the sand - this minimises weed re-growth and facilitates easy sludge removal while still allowing drainage to take place. • Ensure spreadsheet is being kept up to date and not only populated once a month. • Process Controllers to interact with the data collected on site - draw graphs etc. to track operational changes (quality & quantities). • Process Controllers should receive feedback from both the internal lab and the independent laboratory. • The calibration of the equipment used on site should be verified by the internal lab. • Consider expanding the spreadsheet to provide operational feedback and not act as database only. • Ensure Process Controllers are aware of the Preventative Maintenance Schedule. • Ensure records / logbooks pertaining to preventative maintenance are also available on site. • Start sensitising Process Controllers to take more responsibility for aspects related to risk management

Table C.4.2.10: Recommendations from the detail WWTW Process Audits	
WWTW	**Recommendation**
	pertaining to the operation of the works.
Hermanus	• Ensure tankers keep on discharging in the same way that they are currently doing. It would however be advisable to do periodic spot-check analyses on the contents being discharged. • As the mechanical degritters seem to break down quite frequently, it would be advisable to consider a full refurbishment of these units. • Aerators seems to be switching on and off quite frequently (DO control) – consider providing some delay function on the switchgear as to prevent this frequent switching from causing damage to the motors (also refer to O&M manual for maximum number of starts per hour recommended). • Calibration / verification of the in-line DO meters should be done on a routine basis. • Reduce the MLSS concentration to no more than 3 500 mg/l and then maintain these levels by daily wasting. • Monitor and maintain raw alkalinity at levels above 420 mg/l. • Investigate options for dealing with scum. As installing a scum draw-off system would be quite complex, one could consider a sprayer system to break up the scum and allow it to settle. This would have to include the installation of scum baffles. If scum is going to continue flowing into the Maturation Ponds, regular cleaning would be required. • Increase RAS Pump capacity, i.e. provide bigger motors for pumps. • Investigate options of dealing with back-flow from maturation ponds after heavy rains. • Do not be over-reliant on the automated system - Process Controllers should be encouraged to closely monitor the performance of this section of their Works. • Operate the press for 4.5 hours per day, every day. • Continue cleaning the drying beds and prepare them for use as and when required. Clean more beds as to provide more standby capacity. • Process Controllers to interact with the data collected on site - draw graphs etc. to track operational changes (quality & quantities). • The calibration of the equipment used on site should be verified by the internal lab • Consider expanding the spreadsheet to provide operational feedback and not act as database only. • Ensure Process Controllers are aware of the Preventative Maintenance Schedule. • Ensure records / logbooks pertaining to preventative maintenance are also available on site. • Start sensitising Process Controllers to take more responsibility for aspects related to risk management pertaining to the operation of the works.
Gansbaai	• Ensure maintenance is performed in a way that will ensure minimum downtime of equipment. • Reduce the MLSS concentration to no more than 3 500 mg/l and then maintain these levels by daily wasting. • Measure Alkalinity and ensure it remains in excess of 814 mg/l. • Clean out Chlorine Contact Channel. • Continue running the press 3.5 hours per day, every day. • Clean the drying beds to ensure spare capacity as / when required. • Ensure spreadsheet is being kept up to date and not only populated once a month. • Process Controllers to interact with the data collected on site - draw graphs etc. to track operational changes (quality & quantities). • The calibration of the equipment used on site should be verified by the internal lab. • Consider expanding the spreadsheet to provide operational feedback and not act as database only. • Ensure Process Controllers are aware of the Preventative Maintenance Schedule. • Ensure records / logbooks pertaining to preventative maintenance are also available on site. • Start sensitising Process Controllers to take more responsibility for aspects related to risk management pertaining to the operation of the works.
Pearly Beach	• Clean screen on a regular basis (as the plant is left unattended this should not be neglected). • Ensure screenings are periodically removed from the primary pond (Anaerobic Pond). • Ensure the grit channels are cleaned on a routine basis (as the plant is left unattended this should not be neglected). • Check grit channel flow velocity during tanker discharge – velocity not to exceed 0.3 m/s. • Ensure that screenings are periodically removed from the primary pond. • Remove floating “grass island” from primary pond. • Investigate grit accumulation in the primary pond / Clean out the primary pond. • Consider “boosting” the process in an attempt to improve process performance (short-term remedial step). • Check Residual Chlorine readings on regular basis. • Ensure grit is removed, screenings are cleared, required readings recorded and grounds are maintained. • Ensure operational monitoring, including flowmeter readings and residual chlorine testing is done on a frequent basis. • Filtered COD analyses could provide a different perspective on the system’s compliance. • Ensure records pertaining to maintenance are in line with best-practice principles.

C.4.3. Incident Management

Water Safety Plans are in place for all the water distribution systems and treatment facilities. A detailed risk assessment was executed as part of the process and the existing control measures implemented by Overstrand Municipality were evaluated. An Improvement / Upgrade Plan is also in place with relevant Water and Safety Management Procedures for any type of incident. Detail WTW Process Audits were also completed for all the WTWs during the 2021/2022 financial year (June 2022).

A W_2RAP for the various WWTWs is also in place. The W_2RAP is an all-inclusive risk analysis tool by which risks associated with the management of collection, treatment and disposal of wastewater, are identified and rated (quantified). The identified risks can then be managed according to its potential impacts on the receiving environment / community / resource. Detail WWTW Process Audits were also completed for all the WWTWs during the 2021/2022 financial year (June 2022).

The medium and high risks (Post control) for the source, treatment and distribution for the various water systems, as identified as part of the Water Safety Planning process, are indicated in the table below.

Table C.4.3.1: Medium and High Risks for the various water distribution systems (Water Safety Plan)

Harzards or Hazardous Event	Element	Residual Risk	Existing Control Measures
Buffels River			
Treatment plant needs refurbishment and upgrades.	Treatment	Medium	Upgrade study was done by Zutari. Treatment Plant will be refurbished and upgraded in the next five years. Plant is being maintained to supply water that complies to the SANS241 standards.
Poor condition of pipelines.	Distribution	Medium	Pipe bursts are monitored, the condition of the pipelines are inspected and old pipelines are replaced as funds become available.
Kleinmond			
On-site septic tank systems close to source.	Source: Palmiet River	Medium	Septic tanks are phased out and households are connected to the full waterborne sewer system as capital funding becomes available.
Livestock, human activity at water source (Harmful organisms).	Source: Palmiet River	High	No control measures in place. Long river running from Grabouw to Kleinmond. Can only test raw water as a control measure.
Poor condition of pipelines.	Distribution	Medium	Pipe bursts are monitored, the condition of the pipelines are inspected and old pipelines are replaced as funds become available.
Greater Hermanus			
Falling water levels due to drought or drawdown of water body.	Source: De Bos Dam	Medium	Mitigated by diversification of water sources by addition of boreholes. Boreholes managed according to recommendations in geohydrological report. If allocation from De Bos Dam is decreased, boreholes alone not adequate.
Water allocation from De Bos dam.	Source: De Bos Dam	Medium	Boreholes drilled; Currently adequate supply. A desalination project has been included in the latest WSDP.
Adequacy of infrastructure.	Source: De Bos Dam	Medium	Raw water is augmented from 2 x Borehole fields. A desalination project has been included in the latest WSDP.
Saline ingress would impact on the quality of the water.	Source: Gateway Borehole field	Medium	Monitoring program in place. Manage abstraction - Stop abstracting 3m above sea level / set point.
Groundwater may contain metals naturally occurring in soil / rocks (local geology).	Source: Gateway Borehole field	Medium	Water treatment process for Fe and Mn removal has been implemented. Water stabilised. Scheduled monitoring of Fe and Mn levels. Electrical conductivity monitored in-line.
Security: Theft / Vandalism or sabotage.	Source: Gateway Borehole field	Medium	The area is now fenced and there has been a reduction in vandalism. Should there be no further abatement an alarm system could be considered.
Power failures/ load shedding would impact on the supply of water.	Source: Gateway Borehole field	Medium	Portable generators available. Measures are in place to ensure sustainable supply (reservoir operated at 90%, gravity line from De Bos dam not affected and generator to run the plant).
Saline ingress would impact on the quality of the water.	Source: Hemel & Aarde Borehole field	Medium	Monitoring program in place (Done by Umvoto). Manage abstraction - Stop abstracting 3m above sea level /set point
Groundwater may contain metals	Source: Hemel	Medium	Water treatment process for Fe and Mn removal has been

Table C.4.3.1: Medium and High Risks for the various water distribution systems (Water Safety Plan)			
Harzards or Hazardous Event	**Element**	**Residual Risk**	**Existing Control Measures**
naturally occurring in soil / rocks (local geology).	& Aarde Borehole field		implemented. Scheduled monitoring of Fe and Mn levels. (Done by Umvoto).
Security: Theft / Vandalism or sabotage.	Source: Hemel & Aarde Borehole field	Medium	Fenced and gate locked. A number of alarm systems have been installed together with armed response to curb the cable theft.
Power failures/ load shedding would impact on the supply of water.	Source: Hemel & Aarde Borehole field	Medium	Portable generators available, but due to access constraints to boreholes it would not be possible to use. Measures are in place to ensure sustainable supply (reservoir operated at 90%, gravity line from De Bos dam not affected). Generator available to continue with operation of plant.
Site security (i.e. fencing, gates, locks).	Treatment	High	Boundary fence in place. Fence inspected.
Adequate chemical stock / runs out of stock: Coagulants, chlorine and caustic soda.	Treatment	High	Stock taking done 2 x month. A 3 month re-order level is in place. SLAs with service providers.12 months guaranteed - not possible now. Caustic soda no guarantee any more.
Disposal of sludge.	Treatment	High	Lagoons fully utilised. Project to address the situation.
Safety warning signs.	Treatment	Medium	Plan compiled to erect safety signs has commenced; Health and Safety Officer assigned with responsibility.
PPE , training on the use of equipment and testing of safety equipment i.e. safety shower, eye wash, BA apparatus. Not available / available but not functional.	Treatment	Medium	Safety Officer has identified the need. Required PPE per job determined. Employees equipped with personal protective clothing and /or equipment. Only harnesses and retractable lifeline shared; issued as per job requirement. Training was done for everything listed in fall protection plan. Annual medical fitness evaluation.
Inadequate Safety training.	Treatment	Medium	Annual safety training done: Evacuation drill; Training on handling of chlorine and chlorine leaks; Chemical spillages. There is a Training plan for high risk management standards: Confined spaces, control of hazardous energy, traffic management done. Busy with working on heights. Annual safety inductions (for all staff).
Storage of chemicals.	Treatment	Medium	Tanks in good condition; possibility of leaking tanks / tanks bursting thus reduced. Busy with upgrading of safety system and compiling of emergency plan.
Water losses / Water reclamation.	Treatment	Medium	Water losses calculated monthly; At bio-filter plant Fe-filters backwashed at 80% and Mn filters backwashed 1 x per week. Re-cycle filter backwash water. Filters in conventional plant run up to 36 - 48 hours. Implementation of WDM Strategy.
Gateway borehole treatment; $KMnO_4$ dosing system.	Treatment	Medium	Inspections done by Process Controllers; report any malfunction and will take corrective action immediately. Strainer cleaned 2 x month. Water mixed with outflow from De Bos and Hemel and Aarde borehole systems.
Discharge of filter backwash water.	Treatment	Medium	Although probably impacting of the operation of the Gateway section, measures in place to control the possible associated risks. Filtrate from three filters in Gateway treatment section monitored every 2 hours. Outflow from this section blends with outflow from conventional treatment plant. Adequate chlorine contact time for inactivation of oocysts.
Dosing of caustic soda.	Treatment	Medium	Corrective action is implemented immediately. If Mn concentrations are high, the water is diverted to be treated with the Gateway boreholes. (Challenges with supply of caustic soda will be partially addressed by decreased usage once aeration basin phase 2 has been completed).
Chlorine dosage control.	Treatment	Medium	Standby equipment available. Free chlorine measured every 2 hours and recorded. Routine checks done and findings recorded; action taken immediately. Generator available to run whole plant during power failures.
Chlorine room - the structure / lay out and general safety procedures.	Treatment	Medium	Lay-out of installation meets safety requirements. Adequate safety signs. Chlorine detector. Chlorine room is kept locked; room is alarmed.
Water Losses – Bulk	Distribution	High	Reservoir levels are mainly controlled from Control Room. Annual Control Room training. Planning to replace some pipelines (IDP).
Water Losses - Reticulation	Distribution	High	Planning to replace some pipelines (IDP). Reservoir levels are mainly controlled from Control Room. Annual Control Room training.

Table C.4.3.1: Medium and High Risks for the various water distribution systems (Water Safety Plan)			
Harzards or Hazardous Event	**Element**	**Residual Risk**	**Existing Control Measures**
Communal standpipes	Distribution	High	Consumer education and inspections.
Control Room: Instrumentation failure (e.g. telemetry, SCADA).	Distribution	Medium	Protocols in place. Annual control room training. Manual inspection of reservoir in place. Functional IOT devices as replacement availability in the case of major failure.
Control Room: Tools to do the job.	Distribution	Medium	Session where Process Controllers could list all matters impacting on the work.
Knowledge on the network / training.	Distribution	Medium	Specific areas for training were identified. Training and refresher training were provided.
Reservoir security	Distribution	Medium	Reservoirs mostly fenced and gates are kept locked. Not all reservoirs affected; impact on supply system reduced.
Power outages / load shedding.	Distribution	Medium	Generators available. IOT replacements where high level of vandalism observed.
Infrastructure (pipelines) integrity.	Distribution	Medium	Busy with replacing of infrastructure; documented in WSDP. Planned maintenance done every 4th month. Communication protocol in place. Plans for specific areas are in place (improvement plan).
Infrastructure (pipelines) integrity.	Distribution	Medium	Busy with replacing of infrastructure; documented in WSDP. Bi-monthly network monitoring. Customer care section register complaints, which are then investigated. Communication protocol in place.
Monitoring program compiled, registered on IRIS and implemented according to SANS 241-2:2015.	Water Quality	High	Sampling program compiled and registered on the IRIS, but not compliant.
Training of samplers.	Water Quality	Medium	Training material will be compiled and staff responsible for sampling will be trained. Tertiary qualified employees are responsible for taking of the samples.
Draft Regulation 813 - not meeting the requirements.	Institutional	High	Working 2 shifts, 3 X Class IV would be required - currently Foreman plus 1 x Principal PC (2 x Class IV). Training plans in place.
Inadequate budget.	Institutional	High	Annual O&M budget is adequate. Bi-annual O&M adjustment budget.
Delays with Procurement / Supply chain / credit control.	Institutional	High	Internal changes made, busy with training.
Global warming / impact not considered.	Institutional	High	WSDP covers suggested planning. Response strategies to be included in WSDP. Plan to reduce NRW and water losses. Approach towards Water Resource Management. Dealing with consequences of unpredictability of weather patterns. Good practise in case of Natural Environment. Plan for progressive adaptation to climate change and current challenges.
Asset register not in place and updated with all necessary information.	Institutional	Medium	Asset register in place.
In-migration of people into the area / Increased demand.	Institutional	Medium	Planning: Full implementation of the WC/WDM Strategy and measures. Develop groundwater to its full potential (Licenced volumes). Regional scheme with Overberg Water for possible bulk supply from the Theewaterskloof Dam or the Palmiet River. Direct and indirect potable water re-use.
	Institutional	Medium	Additional reservoir capacity and network replacement planned for over the next 5 -10 years.
Actions not taken on process deficiencies / no infrastructure development planning.	Institutional	Medium	WSDP covers recommendations from Process audit reports and projects. Implementation plans with budgets compiled. Some corrective actions already implemented.
WSP / Annual Revision of WSP.	Institutional	Medium	Now being revised. Institution aware of most risks. Risks were identified and assessed during the last 12 months. Updated risk assessment done (both Veolia and Overstrand Municipality present) on 29 April 2022.
Asset Management.	Institutional	Medium	Busy updating Maintenance schedules to be aligned with asset register. Standby equipment available. From WSDP: The asset renewal needs for the water infrastructure assets over the next 10 years is R65.965 million per year (for all systems).
Reporting of WQ data to DWS / IRIS.	Institutional	Medium	Contract with the external Laboratory also for monthly uploading of data.
Pandemics / Covid 19.	Institutional	Medium	Contingency Plan in place. Procedure was put in place; barrier between teams and plants. Monitored and adjusted.

Table C.4.3.1: Medium and High Risks for the various water distribution systems (Water Safety Plan)			
Harzards or Hazardous Event	**Element**	**Residual Risk**	**Existing Control Measures**
			Awareness done; protocol communicated.
Stanford			
Poor condition of pipelines.	Distribution	Medium	Pipe bursts are monitored, the condition of the pipelines are inspected and old pipelines are replaced as funds become available.
Greater Gansbaai			
On-site septic tank systems close to source.	Source	Medium	Septic tanks are phased out and households are connected to the full waterborne sewer system as capital funding becomes available.
Poor condition of pipelines.	Distribution	Medium	Pipe bursts are monitored, the condition of the pipelines are inspected and old pipelines are replaced as funds become available.
Pearly Beach			
Capacity of the DAFF is inadequate	Treatment	Medium	The DAFF must be upsized as a pre-treatment process on the Koekemoer dam water to the same size as the treatment works.
Poor condition of pipelines.	Distribution	Medium	Pipe bursts are monitored, the condition of the pipelines are inspected and old pipelines are replaced as funds become available.
Baardskeerdersbos and Buffeljags Bay			
Poor condition of pipelines.	Distribution	Medium	Pipe bursts are monitored, the condition of the pipelines are inspected and old pipelines are replaced as funds become available.

The medium and high risks for the wastewater source, drainage systems and wastewater treatment for the various sewer drainage systems, as identified as part of the W_2RAP process, are indicated in the table below.

Table C.4.3.2: Medium and High Risks for the various sewer drainage systems (W_2RAP)			
Harzards or Hazardous Event	**Element**	**Risk**	**Recommendations**
Kleinmond			
Fats and oils getting into sewer system	Wastewater Source	Medium	Regular inspections to be performed at restaurants and garages
Damage to the reticulation system due to construction activity.	Drainage System	Medium	Maintenance teams repair damage pipe as soon as possible.
Power failure at sewer pump stations	Drainage System	Medium	Install permanent generators.
Power failures, MCC failures or Transformer failure.	Wastewater Treatment	Medium	Install permanent generators.
Inefficient or inadequate maintenance lead to treatment failure.	Wastewater Treatment	Medium	The control forms were implemented, which will improve the maintenance and ensure better treatment plant performance.
Instrument failure (e.g. telemetry, SCADA).	Wastewater Treatment	Medium	Maintenance teams are on standby for breakdowns.
The site is not secured, fenced.	Wastewater Treatment	Medium	Fence must be upgraded.
Grit removal not effective. Grit carry-over to the downstream processes.	Wastewater Treatment	Medium	Control forms implemented, which improve grit removal.
Inefficient or inadequate maintenance can lead to treatment failure.	Wastewater Treatment	Medium	The control forms was implemented, which will improve the maintenance and ensure better treatment plant performance. Training was given to PC.
Secondary Treatment: Poor nitrification.	Wastewater Treatment	Medium	Plant must be upgraded in future, but for now control sheets must be implemented, which will improve treatment processes.
Secondary Treatment: Inefficient or inadequate sludge wasting can lead to treatment failure	Wastewater Treatment	Medium	The control forms was implemented, which will improve sludge wasting and PC was given training.
Secondary Treatment: pH correction not done correctly and must be done throughout the day.	Wastewater Treatment	Medium	The control forms must be implemented, which will improve the adding of lime.
Secondary Treatment: Poor operational monitoring leading to potential poor process performance.	Wastewater Treatment	Medium	The control forms must be implemented, which will improve the treatment processes. PC must go for training.

Table C.4.3.2: Medium and High Risks for the various sewer drainage systems (W_2RAP)			
Harzards or Hazardous Event	**Element**	**Risk**	**Recommendations**
Secondary Treatment: Non-optimised treatment processes leads to final effluent quality not complying with the requirements at times.	Wastewater Treatment	Medium	Control sheets must be implemented.
Dosing malfunction due to equipment failure or power failure. Possible interruption to chlorination.	Wastewater Treatment	Medium	Chlorine dosing equipment inspected on daily basis and chlorine samples tested daily
Low free chlorine residual at point of discharge has negative impact on humans / environment.	Wastewater Treatment	Medium	Chlorine test done at discharge points and chlorine set according to demand.
Staff safety is compromised as they do not always were PPE.	Wastewater Treatment	Medium	PPE clothing are left at work so that always available.
The site is not secured, fenced.	Wastewater Treatment	Medium	Fence must be upgraded
Inadequate storage of chemicals can compromise staff safety.	Wastewater Treatment	Medium	More chemical space must be provided.
Hawston			
Sea water ingress into the sewer system.	Wastewater Source	Medium	Inspect the sewer system by taking samples in reticulation system and pump stations to find the sea water ingress position.
Damage to the reticulation system due to construction activity.	Drainage System	Medium	Maintenance teams repair damage pipes as soon as possible.
Fower failures at sewer pump stations.	Drainage System	Medium	Install permanent generators.
Power failures, MCC failures or Transformer failure.	Wastewater Treatment	Medium	A generator should be provided to the Hawston WWTW.
Inefficient or inadequate maintenance lead to treatment failure.	Wastewater Treatment	Medium	The control forms were implemented, which will improve the maintenance and ensure better treatment plant performance.
High strength influent (high organic load)	Wastewater Treatment	Medium	Put a system in place at the Hawston WWTW entrance where control can be kept on the quantities and nature (quality) of tank truck contents discharged into the inlet works.
Instrument failure (e.g. telemetry, SCADA).	Wastewater Treatment	Medium	Maintenance teams are on standby for breakdowns.
Inlet flow measurement measures less than outlet meter.	Wastewater Treatment	Medium	Inlet must be upgraded.
Ineffective removal of grit	Wastewater Treatment	Medium	Inlet works must be upgraded, but PCs must clean grit channels more.
Secondary Treatment: Inefficient or inadequate sludge wasting can lead to treatment failure	Wastewater Treatment	Medium	The control forms was implemented, which will improve sludge wasting and PC was given training. Sludge screw press must be upgraded to handle sludge load.
Secondary Treatment: pH correction not done correctly and must be done throughout the day.	Wastewater Treatment	Medium	The control forms must be implemented, which will improve the adding of lime.
Secondary Treatment: Poor aeration in aeration basin	Wastewater Treatment	Medium	The aerators was refurbished. Control forms was implemented to monitor aeration. New bigger aerators must be installed.
Secondary Treatment: High organic loads can have an affect on the final quality.	Wastewater Treatment	Medium	Daily quality testing must be done.
No disinfection at plant.	Wastewater Treatment	Medium	Chlorine dosing system must be implemented in the future.
Staff safety is compromised as they do not always were PPE.	Wastewater Treatment	Medium	PPE clothing are left at work so that always available.
The site is not secured, fenced.	Wastewater Treatment	Medium	Fence must be upgraded
Inadequate storage of chemicals can compromise staff safety.	Wastewater Treatment	Medium	More chemical space must be provided.
Hermanus			
Sea water ingress into the sewer system.	Wastewater Source	Medium	Inspect the sewer system by taking samples in reticulation system and pump stations to find the sea water ingress position.
Fats and oils getting into sewer system.	Wastewater Source	Medium	Regular inspections to be performed at restaurants and garages.

Table C.4.3.2: Medium and High Risks for the various sewer drainage systems (W_2RAP)			
Harzards or Hazardous Event	**Element**	**Risk**	**Recommendations**
Uncontrolled discharge of inorganic / organic chemicals into the sewer system by industries.	Wastewater Source	Medium	Inspect the sewer system by taking samples and writing letters to industries to comply to the quality stipulated in the mun by-laws.
Damage to the reticulation system due to construction activity.	Drainage System	Medium	Maintenance teams repair damage pipes as soon as possible.
Power (Electricity) failures at pump stations.	Drainage System	Medium	Make use of roaming generators and suction tankers. Monitor early warning system.
Pump failures at pump stations.	Drainage System	Medium	Use maintenance teams to do repair word and use suction tankers to control sump level of pump stations. Ensure duty and standby pump operations. Monitor early warning system.
MCC failures at pump stations.	Drainage System	Medium	Use maintenance teams to do repair work and use suction tankers to control sump level of pump station.
Pump station vandalism.	Drainage System	Medium	Use maintenance teams to do repair word and use suction tankers to control sump level of pump stations. Investigate security measures and daily inspections. Monitor early warning system.
Insufficient sump and / or pump capacity at pump stations.	Drainage System	High	Implement Master Planning
Pump station rising main failure	Drainage System	Medium	Use maintenance teams to do repair word and use suction tankers to control sump level of pump stations. Monitor early warning system.
Power failures, MCC failures or Transformer failure.	Wastewater Treatment	Medium	Generators were provided with upgrade and tested on a weekly basis.
Inefficient or inadequate maintenance lead to treatment failure.	Wastewater Treatment	Medium	The control forms were implemented, which will improve the maintenance and ensure better treatment plant performance.
Instrument failure (e.g. telemetry, SCADA).	Wastewater Treatment	Medium	Maintenance teams are on standby for breakdowns.
Inefficient or inadequate maintenance can lead to treatment failure.	Wastewater Treatment	Medium	Job card system in place to ensure maintenance requests are captured and executed.
Secondary Treatment: Inefficient or inadequate sludge wasting can lead to treatment failure	Wastewater Treatment	Medium	The control forms was implemented, which will improve sludge wasting and PC was given training.
Secondary Treatment: pH correction not done correctly and must be done throughout the day.	Wastewater Treatment	Medium	The control forms must be implemented, which will improve the adding of lime.
Secondary Treatment: High organic loads can have an affect on the final quality.	Wastewater Treatment	Medium	Daily quality testing must be done.
Dosing malfunction due to equipment failure or power failure. Possible interruption to chlorination.	Wastewater Treatment	Medium	Chlorine dosing equipment inspected on daily basis and chlorine samples tested daily
Low free chlorine residual at point of discharge has negative impact on humans / environment.	Wastewater Treatment	Medium	Chlorine test done at discharge points and chlorine set according to demand.
Pooling of wastewater (result in fly breeding and public health hazard).	Wastewater Treatment	Medium	Irrigation controlled by telemetric system and sport field gets only specific volume of water. Irrigation effluent water is disinfected again after treatment and tested by external laboratory monthly.
Poor maintenance of irrigation infrastructure.	Wastewater Treatment	Medium	Irrigation infrastructure monitored on a daily basis and repaired immediately. Maintenance contract in place.
Staff safety is compromised as they do not always were PPE.	Wastewater Treatment	Medium	PPE clothing are left at work so that always available.
Public entering the treatment works.	Wastewater Treatment	Medium	More security with a new camera system with flood lights.
Stanford			
Damage to the reticulation system due to construction activity.	Drainage System	Medium	Maintenance teams repair damage pipes as soon as possible.
Power failure at pump stations	Drainage System	Medium	Install permanent generators.
Inefficient or inadequate maintenance lead to treatment failure.	Wastewater Treatment	Medium	The control forms were implemented, which will improve the maintenance and ensure better treatment plant performance.
Instrument failure (e.g. telemetry, SCADA).	Wastewater Treatment	Medium	Maintenance teams are on standby for breakdowns.

Table C.4.3.2: Medium and High Risks for the various sewer drainage systems (W_2RAP)			
Harzards or Hazardous Event	**Element**	**Risk**	**Recommendations**
Secondary Treatment: Inefficient or inadequate sludge wasting can lead to treatment failure	Wastewater Treatment	Medium	The control forms was implemented, which will improve sludge wasting and PC was given training.
Poor operational monitoring leading to potential poor process performance.	Wastewater Treatment	Medium	Control sheets must be implemented, which will improve treatment processes. PC must go for training.
Non-optimised treatment processes leads to final effluent quality not complying with the requirements at times.	Wastewater Treatment	Medium	Control sheets must be implemented.
Dosing malfunction due to equipment failure or power failure. Possible interruption to chlorination.	Wastewater Treatment	Medium	Chlorine dosing equipment inspected on daily basis and chlorine samples tested daily
Low free chlorine residual at point of discharge has negative impact on humans / environment.	Wastewater Treatment	Medium	Chlorine test done at discharge points and chlorine set according to demand.
Staff safety is compromised as they do not always were PPE.	Wastewater Treatment	Medium	PPE clothing are left at work so that always available.
Greater Gansbaai			
Sea water ingress into the sewer system.	Wastewater Source	Medium	Inspect the sewer system by taking samples in reticulation system and pump stations to find the sea water ingress position.
Fats and oils getting into sewer system.	Wastewater Source	Medium	Regular inspections to be performed at restaurants and garages.
Damage to the reticulation system due to construction activity.	Drainage System	Medium	Maintenance teams repair damage pipes as soon as possible.
Pump failures at pump stations.	Drainage System	Medium	Install permanent generators.
Power failures, MCC failures or Transformer failure.	Wastewater Treatment	Medium	Generators must be installed at the Gansbaai WWTW.
Inefficient or inadequate maintenance lead to treatment failure.	Wastewater Treatment	Medium	The control forms were implemented, which will improve the maintenance and ensure better treatment plant performance.
Instrument failure (e.g. telemetry, SCADA).	Wastewater Treatment	Medium	Maintenance teams are on standby for breakdowns.
Flow meter not accurate.	Wastewater Treatment	Medium	Flow meter must be calibrated.
Meter between holding tank and reactor not working.	Wastewater Treatment	Medium	Meter must be inspected on daily basis.
Power failure at the WWTW.	Wastewater Treatment	Medium	Generators must be installed at the Gansbaai WWTW.
Raw sewage feed pumps between holding tank and reactor not working.	Wastewater Treatment	Medium	Pumps must be inspected on a daily basis.
Aeration system not working.	Wastewater Treatment	Medium	Blowers must be inspected on a daily basis.
High organic loads can have an affect on the final quality.	Wastewater Treatment	Medium	Daily quality testing must be done.
Chlorine dosing equipment, contact tank is not regularly cleaned / maintained.	Wastewater Treatment	Medium	Chlorine dosing equipment and contact tank must be inspected on a daily basis.
Dosing malfunction due to equipment failure or power failure. Possible interruption to chlorination.	Wastewater Treatment	Medium	Chlorine dosing equipment inspected on daily basis and chlorine samples tested daily
Disinfection chemicals supply runs out.	Wastewater Treatment	Medium	Extra chlorine cylinders must be available when necessary.
Chlorine under dosing may occur due to increased chlorine demand of poorly treated effluent or increased effluent flows.	Wastewater Treatment	Medium	Chlorine test done on daily basis and set according to need. Control forms must be completed daily.
Low free chlorine residual at point of discharge has negative impact on humans / environment.	Wastewater Treatment	Medium	Chlorine test done at discharge points and chlorine set according to demand.
Pooling of wastewater (result in fly breeding and public health hazard).	Wastewater Treatment	Medium	Irrigation controlled by telemetric system and sport field gets only specific volume of water. Irrigation effluent water is disinfected again after treatment and tested by external

Table C.4.3.2: Medium and High Risks for the various sewer drainage systems (W_2RAP)			
Harzards or Hazardous Event	**Element**	**Risk**	**Recommendations**
			laboratory monthly.
Poor maintenance of irrigation infrastructure.	Wastewater Treatment	Medium	Irrigation infrastructure monitored on a daily basis and repaired immediately. Maintenance contract in place.
Staff safety is compromised as they do not always were PPE.	Wastewater Treatment	Medium	PPE clothing are left at work so that always available.
Pearly Beach			
Power failure at pump stations	Drainage System	Medium	Install permanent generators.
Inefficient or inadequate maintenance lead to treatment failure.	Wastewater Treatment	Medium	The control forms were implemented, which will improve the maintenance and ensure better treatment plant performance.
Ineffective removal of grit	Wastewater Treatment	Medium	Process Controllers must clean grit channels more when necessary and the steel grit must be replaced with GRP.
Remove screenings from ponds.	Wastewater Treatment	Medium	Process Controllers must clean grit channels to prevent screenings landing up in ponds.
Boost process to improve performance.	Wastewater Treatment	Medium	Improve process with the installation of aerators, etc.
Dosing malfunction due to equipment failure or power failure. Possible interruption to chlorination.	Wastewater Treatment	Medium	Chlorine dosing equipment inspected on daily basis and chlorine samples tested.
Low free chlorine residual at point of discharge has negative impact on humans / environment.	Wastewater Treatment	Medium	Chlorine test done at discharge points and chlorine set according to demand.

The Water Safety Plan and W_2RAP Teams of Overstrand Municipality are committed to meet regularly to review the implementation of all the aspects of the Water Safety Plan and W_2RAP to ensure that they are still accurate and to determine whether the field assessments need updates or modifications and whether the Incident Response Management Protocol is still adequate. In addition to the regular three-year review, the Water Safety Plan and W_2RAP will also be reviewed when, for example, a new water source is developed, major treatment improvements are planned and brought into use, or after a major incident.

An Incident Response Management Protocol is in place and forms part of Overstrand Municipality's Water Safety Plan and W_2RAP. The Incident Response Management Protocol entails that certain reactive procedures are followed when an incident occurs, such as when a malfunction of the treatment processes occurs due to power failures, faulty equipment, adverse weather conditions or human error.

Operational Alert Levels are also in place for the various WTWs and WWTWs in order to ensure that the various unit processes in the plant performs optimally. If these pre-determined Alert Levels are exceeded at any of the control points where samples are taken for operational purposes, specific actions are taken to bring the operational parameters back to within the target ranges.

Table C.4.3.3: Incident Management and Reporting Overview					
WSDP Ref #	**Measurable / Enabling Factor**	**Unit**	**Year 0**	**Year - 1**	**Year - 2**
			FY2022/23	**FY2021/22**	**FY2020/21**
6.3	**Water Supply and Quality**				
6.3.1	Incident Management Protocol in place	yes/total schemes in %	100%	100%	100%
6.3.5	Failure Response Management in place	yes/total schemes in %	100%	100%	100%
6.4	**Waste Water Supply and Quality**				
6.4.1	Incident Management Protocol in place	yes/total schemes in %	100%	100%	100%
6.4.5	Failure Response Management in place	yes/total schemes in %	100%	100%	100%

Table C.4.3.4: Water Quality Incident Reporting Compliance (Health Oriented)										
Measurable / Enabling Factor	Unit	Year 0 FY2022/23			Year-1 FY2021/22			Year-2 FY2020/21		
		Acute Health Micriobiological	Acute Health Chemical	Chronic Health	Acute Health Micriobiological	Acute Health Chemical	Chronic Health	Acute Health Micriobiological	Acute Health Chemical	Chronic Health
Failures in terms of Analysis	Total nr	1255	95	2685	983	95	2310	924	90	2086
	Nr of failures	8	0	12	9	0	3	1	0	0
	Failure %	0.6%	0.0%	0.4%	0.9%	0.0%	0.1%	0.1%	0.0%	0.0%
	Nr reported	8	0	12	9	0	3	1	0	0
	Reported % of failure	100%	100%	100%	100%	100%	100%	100%	100%	100%
Failures in terms of Samples	Total	1255	95	2685	983	95	2310	924	90	2086
	Nr of failures	8	0	12	9	0	3	1	0	0
	Failure %	0.6%	0.0%	0.4%	0.9%	0.0%	0.1%	0.1%	0.0%	0.0%
	Nr reported	8	0	12	9	0	3	1	0	0
	Reported % of failure	100%	100%	100%	100%	100%	100%	100%	100%	100%
Failures in terms of Sites	Total	1255	95	2685	983	95	2310	924	90	2086
	Nr of failures	8	0	12	9	0	3	1	0	0
	Failure %	0.6%	0.0%	0.4%	0.9%	0.0%	0.1%	0.1%	0.0%	0.0%
	Nr reported	8	0	12	9	0	3	1	0	0
	Reported % of failure	100%	100%	100%	100%	100%	100%	100%	100%	100%

C.5. Water Conservation and Water Demand Management

The table below gives an overview of the WC/WDM activities implemented by Overstrand Municipality.

Table C.5.1: Overview of WC/WDM Activities

WSDP Ref. #	Regulations Ref. #	Description	Urban Settlements						Rural Settlements					
			Year 0		Year - 1		Year - 2		Year 0		Year - 1		Year - 2	
			2022/23		2021/22		2020/21		2022/23		2021/22		2020/21	
7.1.1	10.2.g.iii	**REDUCING UNACCOUNTED FOR WATER AND WATER INEFFICIENCIES**												
		Number of customers where the following activities have been pursued:	Nr	% of total	Nr	% of total	Nr	% of total	Nr	% of total	Nr	% of total	Nr	% of total
7.1.1.1		Night flow metering	9 000	33%	9 000	33%	9 000	33%	0	0%	0	0%	0	0%
7.1.1.2		Day flow metering	42 469	100%	41 397	100%	40 324	100%	0	0%	0	0%	0	0%
7.1.1.3		Reticulation leaks fixed	307	100%	333	100%	267	100%	0	0%	0	0%	0	0%
7.1.1.4		Illegal connections formalized	0	100%	0	100%	0	100%	0	0%	0	0%	0	0%
7.1.1.5		Un-metered connections, metered	0	100%	0	100%	0	100%	0	0%	0	0%	0	0%
7.1.2	10.2.g.iii	**REDUCING HIGH PRESSURES FOR RESIDENTIAL CONSUMERS**												
		Number of residential consumers with water supply pressure of:	Nr	% of total	Nr	% of total	Nr	% of total	Nr	% of total	Nr	% of total	Nr	% of total
7.1.2.1		< 300 kPa	660	1.7%	646	1.7%	631	1.7%	0	0%	0	0%	0	0%
7.1.2.2		300 kPa - 600 kPa	1 943	5.0%	1 899	5.0%	1 855	5.0%	0	0%	0	0%	0	0%
7.1.2.3		600 kPa - 900 kPa	36 131	93.0%	35 319	93.0%	34 506	93.0%	0	0%	0	0%	0	0%
7.1.2.4	10.2.b.iii	> 900 kPa	117	0.3%	114	0.3%	111	0.3%	0	0%	0	0%	0	0%
7.1.3	10.2.g.iii	**LEAK AND METER REPAIR PROGRAMMES**												
		Number of consumer units targeted by:	Nr	% of total	Nr	% of total	Nr	% of total	Nr	% of total	Nr	% of total	Nr	% of total
7.1.3.1		Leak repair assistance programme	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
7.1.3.2	10.2.g.iv	Retro-fitting of water inefficient toilets	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
7.1.3.3		Meter repair programme	145	0.3%	1 782	4.3%	25	0.0%	0	0%	0	0%	0	0%
7.1.4	10.2.g.iii	**CONSUMER / END-USE DEMAND MANAGEMENT: PUBLIC INFO AND EDUCATION PROGRAMMES**												
			Nr	% of total	Nr	% of total	Nr	% of total	Nr	% of total	Nr	% of total	Nr	% of total
7.1.4.1		Number of schools targeted by education programmes	10	60%	10	60%	10	60%	0	0%	0	0%	0	0%
7.1.4.2		Number of consumers (people) targeted by public information programmes	42 469	100%	41 397	100%	40 324	100%	0	0%	0	0%	0	0%

Quantity of water unaccounted for (Ml/year):

The table below gives a summary of the treatment losses, NRW, water losses and ILIs for the various distribution systems in Overstrand Municipality's Management Area.

Table C.5.2: Treatment Losses, NRW, Water Losses and ILIs for the Various Water Distribution Systems

Water Distribution System	Component	Unit	22/23	Record: Prior (Ml/a)				
				21/22	20/21	19/20	18/19	17/18
Buffels River	Treatment Losses	Volume	26.640	51.005	14.959	79.606	60.724	64.571
		Percentage	3.97%	6.47%	1.94%	10.37%	7.58%	9.94%
	NRW	Volume	232.091	358.678	383.457	335.271	407.056	265.104
		Percentage	35.99%	48.65%	50.60%	48.70%	54.98%	45.31%
	Water Losses	Volume	169.546	295.471	330.845	302.971	345.276	263.934
		Percentage	26.29%	40.08%	43.66%	44.01%	46.63%	45.11%
	ILI		**1.73**	**3.04**	**3.44**	**3.00**	**3.45**	**2.67**
	The current treatment losses of below 10% are at an acceptable level. The NRW and Water Losses were reduced by approximately 13% over the last financial year, which is excellent. The NRW percentage is however still above the DWS's target of 30% and the Municipality needs to continue with the implementation of specific WC/WDM measures to further reduce the NRW and water losses. The Municipality needs to work towards targets of 30% for the NRW and 20% for the water losses. The ILI value indicates an excellent system, with no immediate intervention required and the Municipality needs to keep the ILI level below 2.							
Kleinmond	Treatment Losses	Volume	86.275	61.360	75.267	73.584	67.349	16.091
		Percentage	9.40%	7.04%	8.55%	8.19%	8.64%	2.25%
	NRW	Volume	287.316	281.074	289.372	276.922	183.409	188.379
		Percentage	34.54%	34.69%	35.94%	33.57%	25.75%	26.90%
	Water Losses	Volume	283.332	269.958	282.963	273.090	178.280	186.978
		Percentage	34.06%	33.32%	35.15%	33.11%	25.03%	26.70%
	ILI		**3.09**	**2.96**	**3.11**	**3.30**	**2.17**	**2.28**
	The current treatment losses of below 10% are at an acceptable level. The NRW and water losses stayed roughly the same for the last two financial years. The NRW percentage is above the DWS's target of 30% and the Municipality needs to continue with the implementation of specific WC/WDM measures to reduce the NRW and water losses. The Municipality needs to work towards targets of 30% for the NRW and 25% for the water losses. The current ILI value of 3.09 is good and no urgent action is required, but the NRW and Water Losses should however be monitored carefully.							
Greater Hermanus	Treatment Losses	Volume	113.774	194.527	217.909	445.591	487.283	539.107
		Percentage	2.67%	4.56%	5.14%	10.79%	11.77%	12.89%
	NRW	Volume	816.989	753.296	960.986	430.532	332.685	262.270
		Percentage	19.67%	18.50%	23.88%	11.69%	9.10%	7.20%
	Water Losses	Volume	782.891	702.134	947.239	416.581	316.318	254.983
		Percentage	18.85%	17.25%	23.54%	11.31%	8.66%	7.0%
	ILI		**1.77**	**1.62**	**2.23**	**0.98**	**0.75**	**0.62**
	The current treatment losses of below 10% are at an acceptable level. The current NRW and water losses percentages are at good levels and the Municipality needs to maintain the percentages for the NRW and water losses below 20%. The ILI value indicates an excellent system, with no immediate intervention required and the Municipality needs to keep the ILI level below 2.							
Stanford	Treatment Losses	Volume	235.534	197.305	143.545	40.381	53.133	20.993
		Percentage	47.26%	42.08%	32.15%	11.05%	14.18%	6.53%
	NRW	Volume	13.485	17.035	79.613	93.141	90.868	78.723
		Percentage	5.13%	6.27%	26.28%	28.65%	28.25%	26.20%
	Water Losses	Volume	11.884	13.758	78.036	91.463	87.478	78.122
		Percentage	4.52%	5.07%	25.76%	28.14%	27.19%	26.00%
	ILI		**0.33**	**0.39**	**2.27**	**4.31**	**4.16**	**3.81**
	The treatment losses of the RO plant is closely monitored by the Municipality to ensure that it is at acceptable levels. There was a drastic decrease in the NRW and water losses for the last two financial years for Stanford. The Municipality recently installed a new bulk water meter in order to ensure that readings for the calculation of the NRW and Water are accurate. The Municipality needs to keep the NRW below a target of 20% and the water losses below a target of 15%. The ILI value is extremely low and it will be verified during the new financial year, when the readings from the newly installed bulk water meter become available.							
Greater Gansbaai	Treatment Losses (Franskraal)	Volume	83.200	120.239	97.490	64.025	66.610	55.750
		Percentage	6.55%	10.64%	8.69%	5.45%	5.56%	5.02%

Table C.5.2: Treatment Losses, NRW, Water Losses and ILIs for the Various Water Distribution Systems								
Water Distribution System	**Component**	**Unit**	**22/23**	**Record: Prior (Ml/a)**				
				21/22	**20/21**	**19/20**	**18/19**	**17/18**
	Treatment Losses (De Kelders)	Volume	83.545	69.131	79.262	69.012	71.221	68.287
		Percentage	23.11%	19.71%	22.89%	19.68%	19.71%	16.30%
	NRW	Volume	455.188	308.847	308.492	390.657	450.328	449.900
		Percentage	31.08%	23.92%	23.89%	28.07%	31.67%	32.01%
	Water Losses	Volume	450.605	294.694	303.451	384.859	445.817	447.089
		Percentage	30.77%	22.82%	23.50%	27.66%	31.35%	31.81%
	ILI		**3.16**	**2.13**	**2.26**	**3.03**	**3.58**	**3.84**
	The treatment losses of the De Kelders RO plant are closely monitored by the Municipality to ensure that it is at acceptable levels. The current treatment losses of below 10% for the Franskraal plant are at an acceptable level. The NRW percentage is just above the DWS's target of 30% and the Municipality needs to continue with the implementation of specific WC/WDM measures to reduce the NRW and water losses. The Municipality needs to work towards targets of 30% for the NRW and 25% for the water losses. The current ILI value of 3.16 is good and no urgent action is required, but the NRW and Water Losses should however be monitored carefully.							
Pearly Beach	Treatment Losses	Volume	7.263	-6.419	4.756	4.891	29.603	5.860
		Percentage	4.89%	-4.35%	3.10%	3.15%	16.98%	4.64%
	NRW	Volume	25.787	41.065	44.318	46.005	38.499	23.495
		Percentage	18.25%	26.65%	29.81%	30.57%	26.60%	19.52%
	Water Losses	Volume	25.284	39.415	43.574	45.166	37.760	23.254
		Percentage	17.89%	25.58%	29.31%	30.02%	26.09%	19.32%
	ILI		**0.70**	**1.12**	**1.26**	**2.81**	**2.35**	**1.43**
	The current treatment losses of below 10% are at an acceptable level. The current NRW and water losses percentages are at good levels and the Municipality needs to maintain the percentages for the NRW and water losses below 20%. The ILI value indicates an excellent system, with no immediate intervention required and the Municipality needs to keep the ILI level below 2.							
Baardskeerdersbos	Treatment Losses	Volume	2.229	3.202	2.603	2.637	3.101	2.446
		Percentage	11.56%	19.02%	14.67%	14.40%	17.15%	14.26%
	NRW	Volume	8.125	5.883	7.918	6.941	7.509	6.752
		Percentage	47.67%	43.14%	52.31%	44.28%	50.14%	45.91%
	Water Losses	Volume	7.640	5.738	7.871	6.834	7.313	6.723
		Percentage	44.82%	42.08%	52.00%	43.60%	48.83%	45.71%
	ILI		**2.26**	**1.71**	**2.35**	**2.12**	**2.29**	**2.12**
	The Municipality needs to work towards a target of below 10% for the treatment losses. The current NRW and water losses are extremely high. The NRW percentage is above the DWS's target of 30% and the Municipality needs to continue with the implementation of specific WC/WDM measures to reduce the NRW and water losses. The Municipality needs to work towards targets of 35% for the NRW and 30% for the water losses. The current ILI value of 2.26 is good and no urgent action is required, but the NRW and Water Losses should however be monitored carefully.							
Buffeljags Bay	Bulk Distribution Losses	Volume	0.182	0.247	-0.220	-0.139	0.048	0.523
		Percentage	3.10%	4.49%	-3.89%	-2.77%	0.98%	10.53%
	NRW	Volume	1.998	2.299	3.156	0.930	0.770	0.373
		Percentage	35.11%	43.73%	53.68%	18.03%	15.83%	8.40%
	Water Losses	Volume	1.986	2.243	3.127	0.901	0.741	0.364
		Percentage	34.90%	42.67%	53.19%	17.46%	15.24%	8.20%
	ILI		**21.47**	**24.25**	**33.80**	**4.95**	**4.05**	**2.0**
	The bulk distribution losses of below 5% are at an acceptable level. The NRW and Water Losses were reduced by approximately 8% over the last financial year, which are excellent. The NRW percentage is however still above the DWS's target of 30% and the Municipality needs to continue with the implementation of specific WC/WDM measures to reduce the NRW and water losses. The Municipality needs to work towards targets of 30% for the NRW and 25% for the water losses. The current ILI value of 21.5 is extremely high, which requires immediate water loss reduction interventions.							
TOTAL	**NRW**	**Volume**	**1 840.979**	**1 768.177**	**2 077.312**	**1 580.399**	**1 511.124**	**1 274.996**
		Percentage	**24.48%**	**24.04%**	**28.26%**	**22.31%**	**21.54%**	**18.82%**
	Water Losses	**Volume**	**1 733.168**	**1 623.411**	**1 997.106**	**1 521.865**	**1 418.983**	**1 261.447**
		Percentage	**23.04%**	**22.07%**	**27.17%**	**21.48%**	**21.23%**	**18.62%**
	ILI		**1.94**	**1.85**	**2.32**	**1.83**	**1.73**	**1.57**
	The NRW and water losses for all the systems combined increased slightly during the last financial year, but							

Table C.5.2: Treatment Losses, NRW, Water Losses and ILIs for the Various Water Distribution Systems								
Water Distribution System	Component	Unit	22/23	Record: Prior (Ml/a)				
				21/22	20/21	19/20	18/19	17/18
	are still below DWS's target of 30% for the NRW, which is good. The Municipality needs to work towards targets of 20% for the NRW and 15% for the water losses. The current ILI of 1.94 is excellent, with no immediate intervention required and the Municipality needs to keep the ILI level below 2.							

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

Category A = No specific intervention required.

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

Category C = Requires attention

Category D = Requires immediate water loss reduction interventions

The Billed Metered Consumption figures up to 2019/2020 included the raw water volumes supplied from the different raw water pipelines to consumers, as well as the volume of treated effluent re-used by consumers. These volumes were excluded from the 2020/2021 financial year onwards and therefore the drastic increase in the NRW and Water Losses for the 2020/2021 financial year, especially in the Greater Hermanus area.

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

The table below gives an overview of the System Input Volume, Average Billed Metered Consumption and Non-Revenue Water in litre per connection per day for the various water distribution systems for the 2022/2023 financial year.

Table C.5.3: System Input Volume, Average Billed Metered Consumption and NRW in Litre per Connection per Day for the various Water Distribution Systems for 2022/2023									
Water Balance Component	Buffels River	Kleinmond	Greater Hermanus	Stanford	Greater Gansbaai	Pearly Beach	Baardskeer-dersbos	Buffeljags Bay	Overstrand Municipality
System Input Volume	443	558	482	490	537	211	640	433	**485**
Average Billed Metered Cons.	290	366	387	465	370	172	335	281	**366**
Non-Revenue Water	153	193	95	25	167	38	305	152	**119**

The system with the highest system input volume per connection per day is Baardskeerdersbos. The system with the highest average billed metered consumption per connection per day is Stanford, while the Baardskeerdersbos system is the system with the highest non-revenue water per connection per day.

Number of consumers connected to a water reticulation system where pressures rise above 900 kPa at the consumer connection are as follows:

The towns in Overstrand Municipality's Management Area, as identified in the proposed WDM Strategy developed by CES, that should consider pressure management as a measure of water demand management (where the % potential saving > 3% of the total water demand) were as follows:

Table C.5.4: Potential Savings on Bulk Water Supply through the Implementation of Pressure Management

Distribution System	Saving Potential	Number of consumer connections where pressure rise above 900 kPa (Static Pressure)	Comments
Kleinmond	5%	0	Two PRVs were installed
Buffels River (Betty's Bay & Pringle Bay)	4%	0	Five PRVs were installed
Buffels River (Rooi Els)	3%	0	-
Greater Hermanus	3%	0	-
Stanford	< 3%	0	One PRV was installed
Greater Gansbaai	< 3%	64 (Stanfords Bay)	Pressure Management is not viable
Pearly Beach	< 3%	0	

PRVs were installed previously in Kleinmond, Stanford and Betty's Bay and no further PRVs were installed during the last seven financial years. A phased approach was followed for the investigation / implementation of pressure management in selected areas in the Overstrand Municipality's Management Area. The phases were as follows:

- Investigation and Logging (Desktop Study, Logging of pressures and flows, Analysis of data)
- Implementation (Design PRV Chambers, Pressure Management Implementation of new PRVs, Supply and installation of smart electronic pressure controllers for existing PRVs)
- Impact Assessment (Post pressure management logging to determine impact of new PRVs and / or installation of smart pressure controllers on existing PRVs).

The table below gives an overview of the length of water pipelines and the average head for the different water distribution zones (Water Master Plan 2021).

Table C.5.5: Length and Average Head of Water Pipelines

Component Type	Zone	Length (km)	Average Head
Buffels River			
Bulk	Buffels River – Rooi Els	0.099	45.2
	Buffels River	15.227	66.5
	Total	**15.325**	**65.8**
Reticulation	Pringle Bay	37.384	41.9
	Voorberg PRV Zone	37.405	47.4
	Rooi Els	7.509	43.9
	Rooi Els Booster	0.334	43.2
	Bettys Bay	0.012	24.4
	Voorberg Reservoir Zone	22.496	36.6
	Sunny Seas PRV 1 Zone	2.504	26.8
	Sunny Seas Reservoir Zone	10.706	55.4
	Sunny Seas PRV 2 Zone	5.509	31.6
	Total	**123.859**	**43.4**
Kleinmond			
Private	Kleinmond Reservoir	0.271	44.8
	Total	**0.271**	**44.8**
Reticulation	Overhills Booster	0.440	55.0

Table C.5.5: Length and Average Head of Water Pipelines			
Component Type	**Zone**	**Length (km)**	**Average Head**
	Kleinmond Reservoir	34.342	46.7
	Kleinmond PRV	38.719	51.6
	Protearand Booster	1.280	43.1
	Total	**74.781**	**49.2**
Greater Hermanus			
Bulk	Greater Hermanus	31.896	55.8
	Total	**31.896**	**55.8**
Private	Sandbaai	2.268	38.6
	Hemel en Aarde	5.343	69.3
	Hermanus	0.068	27.0
	Fisherhaven LL Reservoir	7.241	26.1
	Vermont	2.607	43.5
	Onrus	0.545	42.7
	Onrus Manor	4.538	78.0
	Total	**22.610**	**57.0**
Raw	Greater Hermanus Raw Water	8.670	66.2
	Greater Hermanus Recycled WW	4.449	48.3
	Total	**13.119**	**55.4**
Reticulation	Sandbaai	41.011	43.2
	Hemel en Aarde	3.038	46.3
	Hermanus	71.492	31.9
	Fisherhaven LL Reservoir	23.402	41.2
	Hawston	28.857	39.9
	Fisherhaven HL	7.956	50.2
	Vermont	23.580	55.3
	Onrus	26.636	51.5
	Onrus Manor	5.433	85.5
	Kidbrooke Place	0.009	1.7
	Mount Pleasant	11.541	46.5
	Northcliff	2.472	37.1
	Hermanus Heights LL	17.619	41.6
	Voëlklip LL	27.030	43.9
	Hermanus Heights HL	1.043	38.0
	Hermanus Heights LL Booster	1.453	67.4
	Voëlklip HL	13.619	49.1
	Total	**306.191**	**43.6**
Stanford			
Bulk	Stanford Bulk Supply	1.241	16.2
	Total	**1.241**	**16.2**
Private	Stanford Reservoir	2.019	60.5
	Total	**2.019**	**60.5**
Raw	Stanford Bulk Supply	4.310	22.1
	Total	**4.310**	**22.1**
Reticulation	Stanford PRV	18.142	42.6
	Stanford Reservoir	14.340	57.1
	Total	**32.482**	**49.0**
Greater Gansbaai			
Bulk	Greater Gansbaai	24.997	31.2
	Total	**24.997**	**31.2**
Raw	Gansbaai Raw Water	10.312	17.8
	Total	**10.312**	**17.8**
Reticulation	Gansbaai	57.804	28.9
	Kleinbaai	22.446	36.6
	De Kelders	24.282	51.7
	Franskraal	36.429	50.1
	Total	**140.961**	**38.5**

Table C.5.5: Length and Average Head of Water Pipelines			
Component Type	**Zone**	**Length (km)**	**Average Head**
Pearly Beach			
Bulk	Pearly Beach Bulk Supply	2.770	11.3
	Total	**2.770**	**11.3**
Raw	Pearly Beach Bulk Supply	9.634	13.9
	Total	**9.634**	**13.9**
Reticulation	Tower	25.784	47.8
	Reservoir	5.185	12.1
	Total	**30.969**	**40.1**
Baardskeerdersbos			
Bulk	Bulk Supply	0.524	25.5
	Baardskeerdersbos Reservoir	0.272	74.5
	Total	**0.796**	**63.2**
Raw	Baardskeerdersbos Reservoir	0.062	3.7
	Total	**0.062**	**3.7**
Reticulation	Baardskeerdersbos Reservoir	0.990	50.5
	Baardskeerdersbos PRV	3.962	51.7
	Total	**4.952**	**51.5**
Buffeljags Bay			
Raw	Buffeljags Bay – Borehole	2.57	1.3
	Total	**2.575**	**1.3**
Reticulation	Buffeljags Bay – Buffeljags Bay Reservoir	0.469	6.1
	Total	**0.469**	**6.1**

Demand management activities undertaken:

Overstrand Municipality is committed to reduce the percentage of Water Losses for the various water distribution systems to below 20%. The Municipality's WDM Strategy and Action Plan include the following key activities (June 2023 progress in brackets):

- Continue with pipe replacement in priority areas with old reticulation networks and history of frequent pipe failures (2018/2019 to 2022/2023 phases included Rooi-Els, Pringle Bay, Betty's Bay, Kleinmond, Northcliff, Zwelihle and Voëlklip);
- Continued operation and maintenance of intelligent pressure management systems in Stanford, Kleinmond and Betty's Bay;
- Phased pro-active replacement of older water meters;
- Review and improve efficiency of remote monitoring of minimum night flows in all zones (On-going maintenance and extension of SCADA and telemetry systems).
- Link properties with distribution zones in financial data base to enable water balance in smaller areas (ongoing in all areas);
- Enhance public awareness on general water and water demand management issues, e.g. the watering of gardens as determined by the bylaws, rainwater harvesting, dam levels, and general water saving tips; regular publication of water and wastewater quality in local media and on Overstrand Municipality's website; pamphlets are being issued with all building plan approvals, and primary school learners are reached with water awareness puppet shows as well as live shows;
- Identify users on financial data base with regular abnormal high or abnormal low water use, and physically inspect the causes (on-going);
- Sourcing of external funds, e.g. from the DWS WSIG program and MIG for water projects;

- Tariffs structured to discourage excessive use of water, including volumetric sewerage tariffs, and specific water restriction tariffs implemented for specific water restriction levels (implemented and on-going);

- Continue with removal of alien vegetation in catchment areas (ongoing);

- Maximum use of treated effluent for irrigation (Implemented and extended in Hermanus and Gansbaai).

DWS's scorecard for assessing the potential for WC/WDM efforts, as completed for Overstrand Municipality, is included in Annexure E. The aim of the scorecard was to establish areas where the municipality has made good progress in relation to WC/WDM and where there is still room for improvement. It can be seen from the Scorecard that there are 25 questions each of which carries a maximum of 4 points providing a possible maximum score of 100. If the Municipality has the specific item completely under control, it receives the maximum points and if it is neglecting the item completely it receives no points. There are various levels between the maximum and the minimum number of points assigned to the municipality for each item depending on the level of completeness or lack thereof. **The status quo score for Overstrand Municipality is 85 out of 100 suggesting that the Municipality is making good progress with regard to the implementation of specific WC/WDM activities.**

The large water users were also identified as part of the Water Master Plan of Overstrand Municipality. The table below gives an overview of the largest water users, with an AADD $\geq$ 15 kl/d (December 2020 to November 2021 Swift Results).

Table C.5.6: Water users with an AADD $\geq$ 15 kl/d

Consumer	Suburb	AADD (kl/d)
Overstrand Municipality	Zwelihle	746
Overstrand Municipality	Gansbaai	318
Overstrand Municipality	Hawston	154
Allen	Caledon Regional District	121
Overstrand Municipality	Kleinmond	85
Onrus Manor Body Corporate	Onrus	83
National Department of Public Works	Gansbaai	78
Overstrand Municipality	Stanford	78
Magna Business Services (Pty) Ltd	Vermont	75
Camphill Farm Community Hermanus	Caledon Regional District	65
Pearly Beach HOA	Pearly Beach	55
Whale Coast Village Mall (Pty) Ltd	Sandbaai	50
Overstrand Municipality	Zwelihle	41
Midnight Storm Inv 295 (Pty) Ltd	Caledon Regional District	35
Berg 'n See	Eastcliff	35
Overberg District Municipality	Caledon Regional District Gbay	35
Abagold LTD	Westcliff	34
Overstrand Municipality	Bredasdorp Regional District Gbay	34
Irvin and Johnson Aquaculture (Pty) Ltd	Caledon Regional District Gbay	34
Sun Dew Villas HOA	Sandbaai	34
VGH 4 Share Block Ltd	Sandbaai	32
Hermanus Society for the welfare of the aged	Westcliff	32
Medi Clinic Hermanus LTD	Westcliff	31
National Department of Public Works	Caledon Regional District	31
Franskraal Caravan Park	Franskraal	31
SS Fernwood	Onrus	29
Communicare	Westcliff	26
Goeie Hoop Housing	Westcliff	26
Mariners Village HOA	Westcliff	26
Shoprite Checkers (Pty) Ltd	Northcliff	26

Table C.5.6: Water users with an AADD ≥ 15 kl/d		
Consumer	**Suburb**	**AADD (kl/d)**
Stanhaven HOA	Stanford	26
Abagold Ltd	Westcliff	26
Overstrand Municipality	Kleinmond	26
Onrus Close Body Corporate	Vermont	24
Kee Property Inv (Pty) Ltd	Northcliff	23
Body Corporate Bayview	Eastcliff	21
Theo Stergianos Properties (Pty) Ltd	Gansbaai	20
Tantosign Proprietary Limited	Sandbaai	19
Overstrand Municipality	Zwelihle	19
The Avenues HOA	Sandbaai	18
Overstrand Municipality	Caledon Regional District	18
HIK Abalone Farm (Pty) Ltd	Westcliff	18
Monte Mare HOA	Sandbaai	18
Negester Estate HOA	Onrus	18
Provincial Dept of Transport and Public Works	Westcliff	17
Premier Fishing SA Pty Ltd	Gansbaai	17
Whale Rock Estate Master HOA	GRP Dev (B/Club, W/Rock, S/Hoek)	16
Aqunion Pty Ltd	Westcliff	16
Cedelia Businesses	Caledon Regional District	16
Apex Land Pty Ltd	Industria Hermanus	15
Overstrand Municipality	Onrus	15
Gerimed Health (Pty) Ltd	Kleinmond	15
Overstrand Municipality	De Kelders	15
Liz Mcgrath Collection (Pty) Ltd	Eastcliff	15
Overstrand Municipality	Zwelihle	15

Progress made with the installation of water efficient devices:

All Municipal buildings were equipped with water saving devices. Flow limiters have been installed at indigent households with consumption above the basic volume and where the consumer was not paying for the water and where leaks have been repaired by the municipality.

A detail WC/WDM investigation into the highest water consumers (Top 80 water consumers) in the Overstrand Municipality's Management Area was also completed in August 2018. The investigation provided great insight into the higher water consumers and it was encouraging that there is a high level of awareness of the water crises and that many consumers are already taking steps towards increased water savings. One of the greatest benefits of the investigation was from a public relations standpoint; for the general public to see an active and engaging Municipality wanting to work together to avert a further crisis.

C.6. Water Services Asset Management

The bulk water and sewerage infrastructure in Overstrand Municipality's Management Area for which the operation and maintenance functions were outsourced to an external Contractor from the 8th of December 2018 are as follows:

- Water Sources: Five (5) dams, one (1) river abstraction, Seventeen (17) boreholes and three (3) springs.
- Bulk Water Infrastructure: Nine (9) WTWs, twenty-one (21) water pump stations, forty-five (45) reservoirs and one hundred and one (101) km of bulk water pipelines.
- Bulk Wastewater Infrastructure: Six (6) WWTWs, fifty-two (52) sewer pump stations and forty-five (45) km of bulk sewer pipelines.

The tables and graphs below give an overview of the water and sewerage infrastructure included in Overstrand Municipality's Asset Register for the end of June 2023.

Water Infrastructure: The current replacement cost and carrying value of the water infrastructure of Overstrand Municipality is summarised in the table below (June 2023).

Table C.6.1: Current Replacement Cost and Carrying Value of the Water Infrastructure (June 2023)

Asset Type	CRC	CV	% CV / CRC
Dams	R11 119 399	R4 212 132	37.9%
Boreholes	R11 161 486	R5 210 180	46.7%
Bulk Water Pipelines	R127 078 859	R45 277 466	35.6%
Pump Stations	R49 252 052	R15 680 482	31.8%
Reservoirs	R120 153 764	R66 182 683	55.1%
Water Reticulation Pipelines	R681 501 128	R247 737 828	36.4%
Buffels River WTW	R13 813 820	R4 589 580	33.2%
Kleinmond WTW	R27 568 183	R9 762 759	35.4%
Preekstoel WTW	R78 510 492	R62 746 623	79.9%
Franskraal New WTW	R36 298 367	R18 413 978	50.7%
Franskraal Old WTW	R20 036 738	R3 222 977	16.1%
Baardskeerdersbos WTW	R6 724 089	R3 355 523	49.9%
Pearly Beach WTW	R8 154 514	R5 049 560	61.9%
De Kelders WTW	R18 982 042	R6 557 326	34.5%
Totals	**R1 210 354 933**	**R497 999 097**	**41.1%**

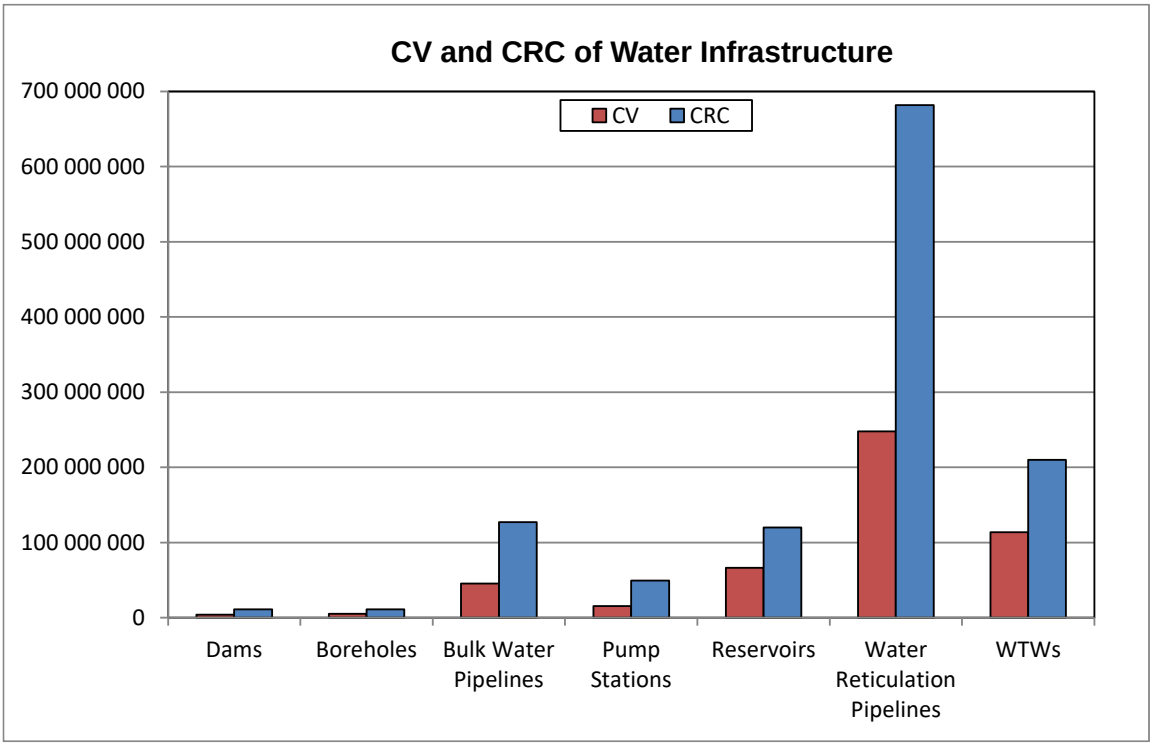


Figure C.6.1: CV and CRC of the Water Infrastructure

The previous table indicates that 58.9% of the value of the water supply infrastructure has been consumed.

The following tables and graphs give an overview of the remaining useful life and the age distribution by facility type for the water infrastructure (CRC).

Table C.6.2: Overview of the Remaining Useful Life by Facility Type for the Water Infrastructure – June 2023 (CRC)					
Asset Type	**0 – 5 yrs**	**6 – 10 yrs**	**11 – 15 yrs**	**16 – 20 yrs**	**> 20 yrs**
Remaining Useful Life					
Dams	R134 772	R549 065	R0	R9 355 486	R1 080 076
Boreholes	R5 505 371	R787 096	R0	R476 057	R4 392 962
Bulk Water Pipelines	R66 198 631	R1 975 841	R0	R15 095 773	R43 808 614
Pump Stations	R27 111 749	R3 525 932	R323 326	R9 802 824	R8 488 221
Reservoirs	R12 551 018	R4 438 285	R428 995	R74 489 805	R28 245 661
Water Reticulation Pipelines	R438 576 815	R21 947 656	R0	R15 986 449	R204 990 208
Buffels River WTW	R4 174 943	R1 643 262	R0	R7 990 365	R5 250
Kleinmond WTW	R3 532 253	R413 610	R18 819	R16 563 102	R7 040 399
Preekstoel WTW	R9 687 516	R5 919 392	R987 859	R1 472 124	R60 443 601
Franskraal New WTW	R14 072 191	R354 761	R63 424	R446 210	R21 361 781
Franskraal Old WTW	R5 320 555	R2 260 796	R6 955	R12 448 432	R0
Baardskeerdersbos WTW	R10 486	R5 198 392	R65 430	R0	R1 449 781
Pearly Beach WTW	R2 661 404	R2 650 272	R112 658	R268 380	R2 461 800
De Kelders WTW	R13 161 873	R0	R242 892	R213 953	R5 363 324
Totals	**R602 699 577**	**R51 664 360**	**R2 250 358**	**R164 608 960**	**R389 131 678**

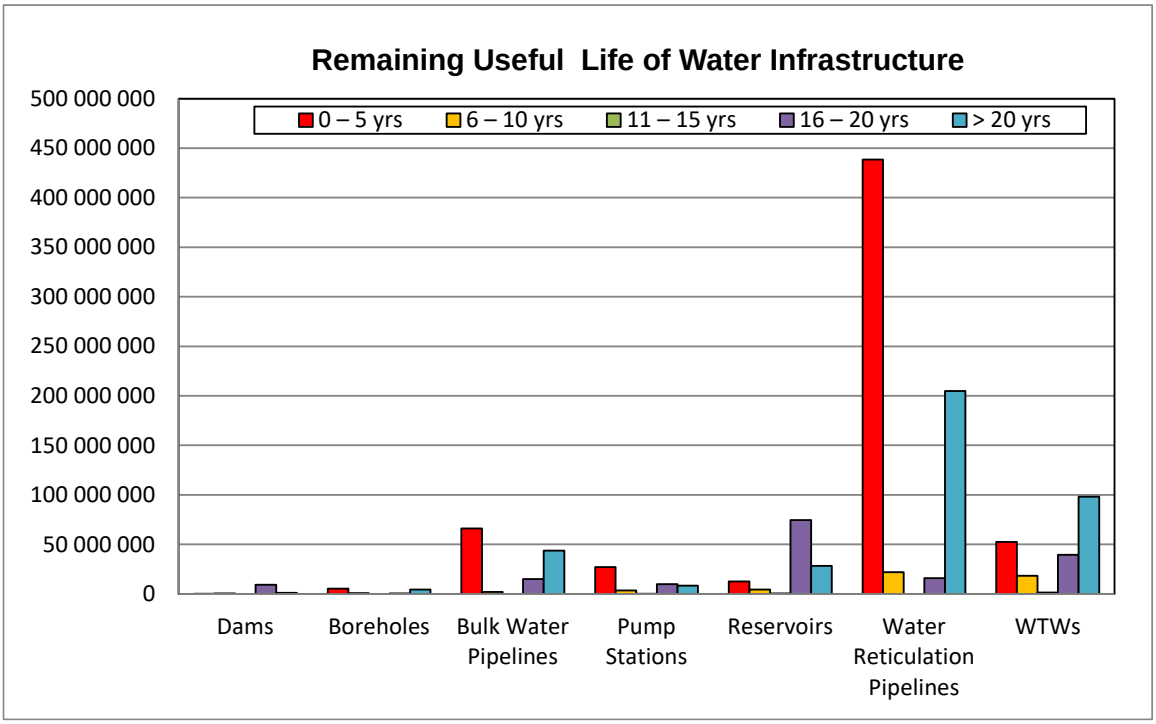


Figure C.6.2: Remaining Useful Life of the Water Infrastructure

Table C.6.3: Overview of the Age Distribution by Facility Type for the Water Infrastructure – June 2023 (CRC)					
Asset Type	**0 – 5 yrs**	**6 – 10 yrs**	**11 – 15 yrs**	**16 – 20 yrs**	**> 20 yrs**
Age distribution by Facility Type					
Dams	R549 065	R0	R0	R134 772	R10 435 562
Boreholes	R118 473	R964 068	R8 577 298	R937 920	R563 727
Bulk Water Pipelines	R0	R0	R24 775 777	R0	R102 303 082
Pump Stations	R0	R238 775	R7 061 858	R21 433 221	R20 518 198
Reservoirs	R186 225	R1 407 859	R9 539 361	R5 558 561	R103 461 758
Water Reticulation Pipelines	R0	R26 593 582	R119 209 386	R134 535 758	R401 162 402
Buffels River WTW	R364 073	R0	R112 335	R3 987 088	R9 350 324
Kleinmond WTW	R0	R0	R1 625 527	R3 521 323	R22 421 333
Preekstoel WTW	R0	R75 632 233	R1 351 766	R1 526 493	R0
Franskraal New WTW	R0	R31 823	R36 266 544	R0	R0
Franskraal Old WTW	R0	R0	R232 856	R2 476 656	R17 327 226
Baardskeerdersbos WTW	R0	R6 724 089	R0	R0	R0
Pearly Beach WTW	R0	R0	R6 293 841	R560 130	R1 300 543
De Kelders WTW	R0	R0	R18 982 042	R0	R0
Totals	**R1 217 836**	**R111 592 429**	**R234 028 591**	**R174 671 922**	**R688 844 155**

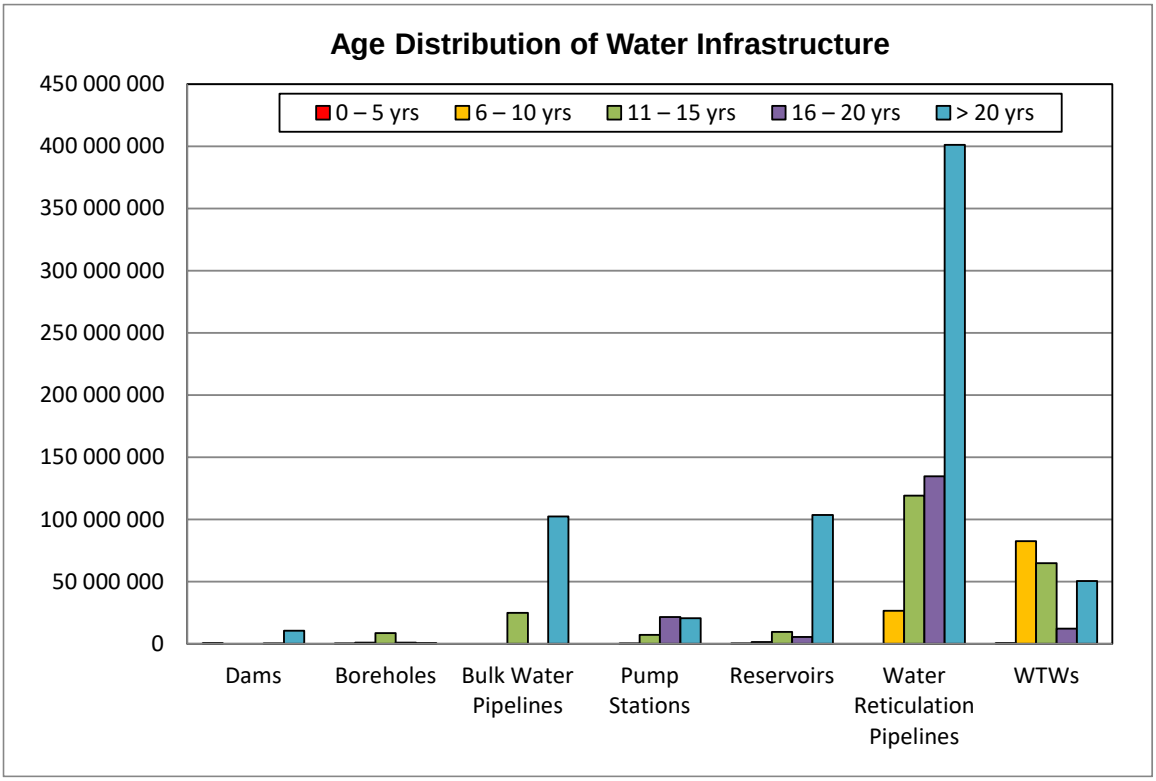


Figure C.6.3: Age Distribution of the Water Infrastructure

Table C.6.4: Overview of the Condition Grading by Facility Type for the Water Infrastructure – June 2023 (CRC)					
Asset Type	**Very Poor**	**Poor**	**Fair**	**Good**	**Very Good**
Condition grading by Facility Type					
Dams	R0	R0	R10 570 334	R0	R549 065
Boreholes	R186 545	R78 365	R8 468 951	R2 411 330	R16 295
Bulk Water Pipelines	R66 198 631	R1 975 841	R26 320 613	R9 505 682	R23 078 092
Pump Stations	R921 951	R6 103 315	R31 217 742	R10 752 696	R256 348
Reservoirs	R5 006 986	R3 691 538	R80 415 707	R30 254 328	R785 205
Water Reticulation Pipelines	R307 354 345	R21 947 656	R183 106 914	R34 745 303	R134 346 910
Buffels River WTW	R0	R409 206	R12 947 079	R93 462	R364 073
Kleinmond WTW	R7 164	R3 168	R20 299 016	R5 851 745	R1 407 090
Preekstoel WTW	R0	R550 608	R16 234 675	R40 817 863	R20 907 346
Franskraal New WTW	R0	R0	R17 242 946	R18 219 366	R836 055
Franskraal Old WTW	R817 309	R6 142 278	R13 077 151	R0	R0
Baardskeerdersbos WTW	R0	R0	R555 518	R2 244 433	R3 924 138
Pearly Beach WTW	R0	R0	R914 226	R3 061 412	R4 178 876
De Kelders WTW	R0	R0	R5 815 836	R1 969 276	R11 196 930
Totals	**R380 492 931**	**R40 901 975**	**R427 186 708**	**R159 926 896**	**R201 846 423**

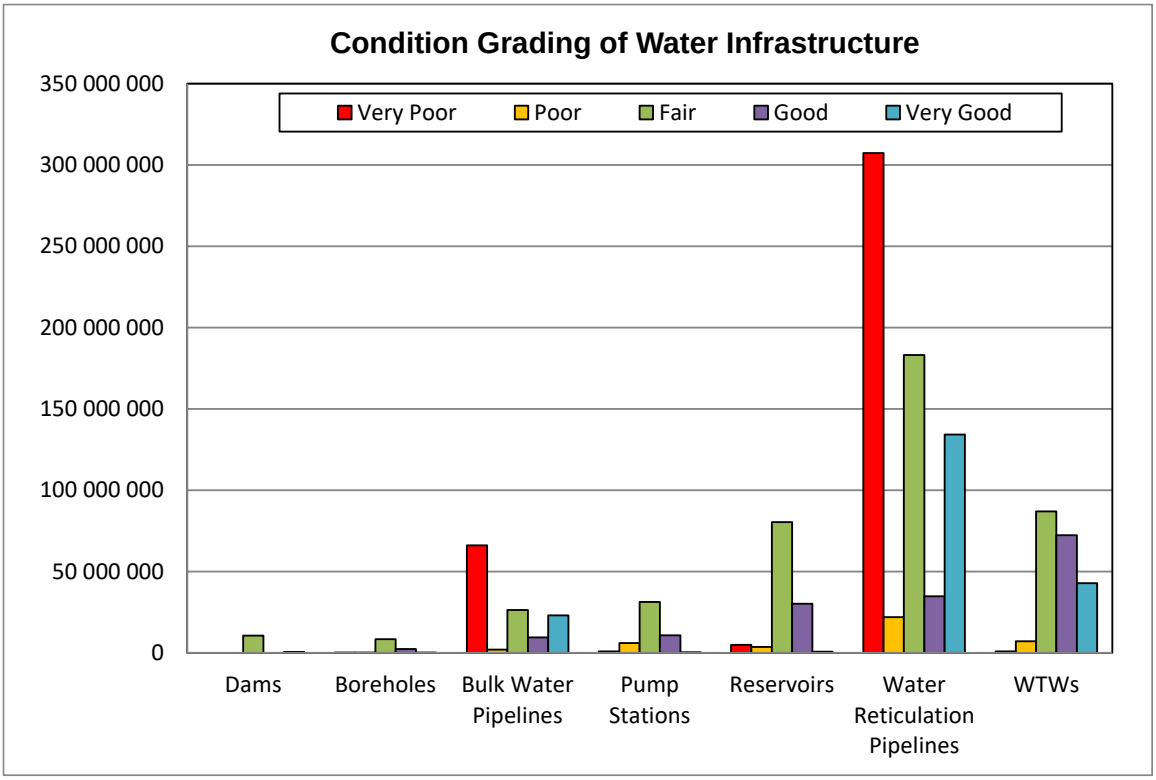


Figure C.6.4: Condition Grading of the Water Infrastructure

Sewerage Infrastructure: The current replacement cost and carrying value of the sewerage infrastructure of Overstrand Municipality is summarised in the table below (June 2023).

Table C.6.5: Current Replacement Cost and Carrying Value of the Sewerage Infrastructure (June 2023)			
Asset Type	**CRC**	**CV**	**% CV / CRC**
Sanitation Pump Stations	R36 884 091	R29 419 087	79.8%
Sewer Reticulation Pipelines	R418 429 511	R350 017 326	83.7%
Stanford WWTW	R18 563 529	R20 671 888	111.4%
Hermanus WWTW	R75 665 898	R31 982 509	42.3%
Hawston WWTW	R13 438 372	R4 343 407	32.3%
Kleinmond WWTW	R13 430 196	R3 808 595	28.4%
Gansbaai WWTW	R34 135 896	R8 846 322	25.9%
Pearly Beach WWTW	R11 060 449	R6 213 515	56.2%
Totals	**R621 607 942**	**R455 302 649**	**73.2%**

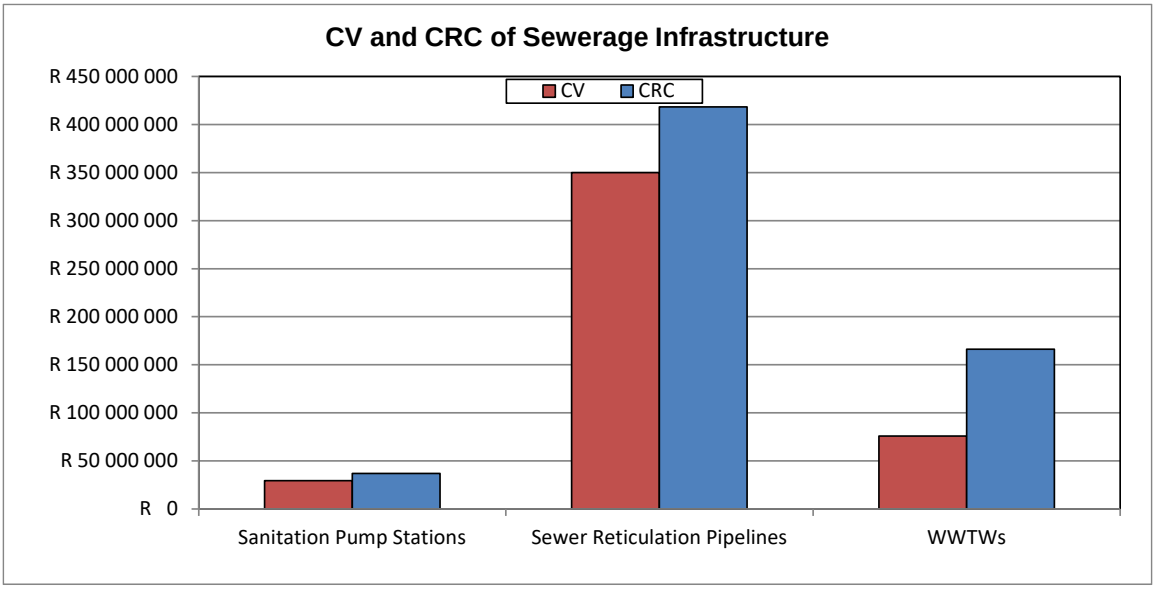


Figure C.6.5: CV and CRC of the Sewerage Infrastructure

The previous table indicates that 26.8% of the value of the sewerage infrastructure has been consumed.

Table C.6.6: Overview of the Remaining Useful Life by Facility Type for the Sewerage Infrastructure – June 2023 (CRC)					
Asset Type	**0 – 5 yrs**	**6 – 10 yrs**	**11 – 15 yrs**	**16 – 20 yrs**	**> 20 yrs**
			RUL		
Sanitation Pump Stations	R16 594 142	R5 036 113	R157 644	R11 500 933	R3 595 259
Sewer Reticulation Pipelines	R4 755 708	R44 560 765	R12 710 160	R46 360 689	R310 042 189
Stanford WWTW	R10 066 779	R1 169 212	R124 499	R5 851 022	R1 352 017
Hermanus WWTW	R9 767 866	R41 485 956	R860 275	R9 705 903	R13 845 898
Hawston WWTW	R6 720 595	R1 498 020	R259 171	R2 075 285	R2 885 301
Kleinmond WWTW	R5 746 948	R2 435 140	R208 575	R2 109 326	R2 930 207
Gansbaai WWTW	R18 306 206	R5 711 316	R434 596	R3 575 748	R6 108 030
Pearly Beach WWTW	R85 365	R409 067	R292 620	R0	R10 273 397
Totals	**R72 043 609**	**R102 305 589**	**R15 047 540**	**R81 178 906**	**R351 032 298**

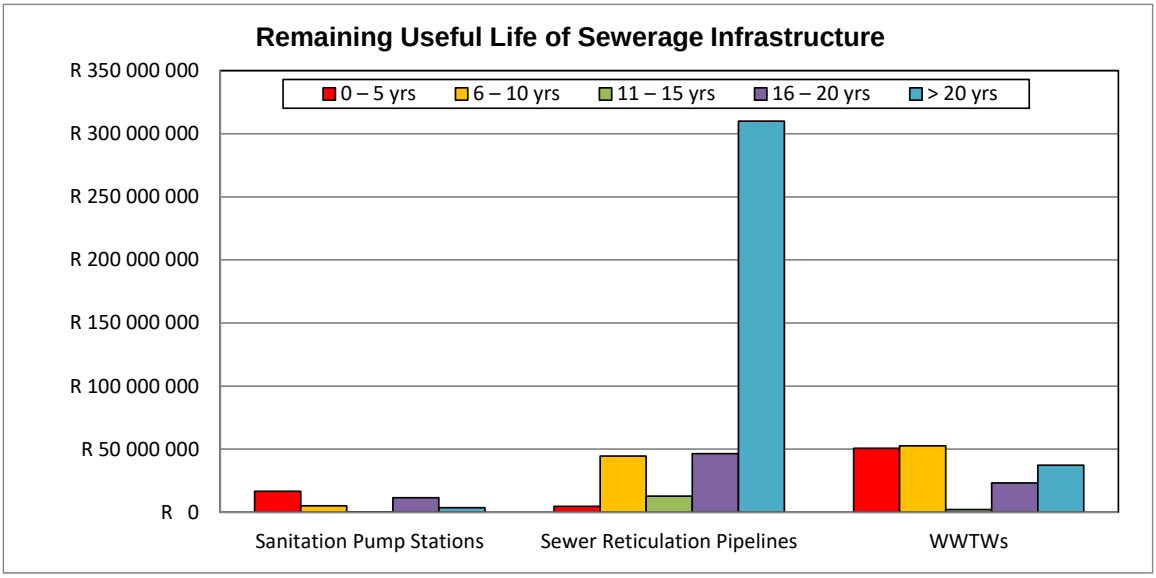


Figure C.6.6: Remaining Useful Life of the Sewerage Infrastructure

Table C.6.7: Overview of the Age Distribution by Facility Type for the Sewerage Infrastructure – June 2023 (CRC)

Asset Type	0 – 5 yrs	6 – 10 yrs	11 – 15 yrs	16 – 20 yrs	> 20 yrs
Age distribution by Facility Type					
Sanitation Pump Stations	R0	R6 155 871	R3 832 078	R14 456 267	R12 439 875
Sewer Reticulation Pipelines	R92 033	R24 193 190	R48 571 983	R0	R345 572 305
Stanford WWTW	R0	R0	R6 323 805	R4 355 297	R7 884 427
Hermanus WWTW	R35 182	R50 033 091	R2 875 535	R2 144 661	R20 577 429
Hawston WWTW	R0	R0	R5 824 224	R2 867 908	R4 746 240
Kleinmond WWTW	R0	R2 271 550	R1 203 605	R4 613 672	R5 341 369
Gansbaai WWTW	R0	R5 670 490	R2 248 236	R16 119 798	R10 097 372
Pearly Beach WWTW	R0	R11 060 449	R0	R0	R0
Totals	**R127 215**	**R99 384 641**	**R70 879 466**	**R44 557 603**	**R406 659 017**

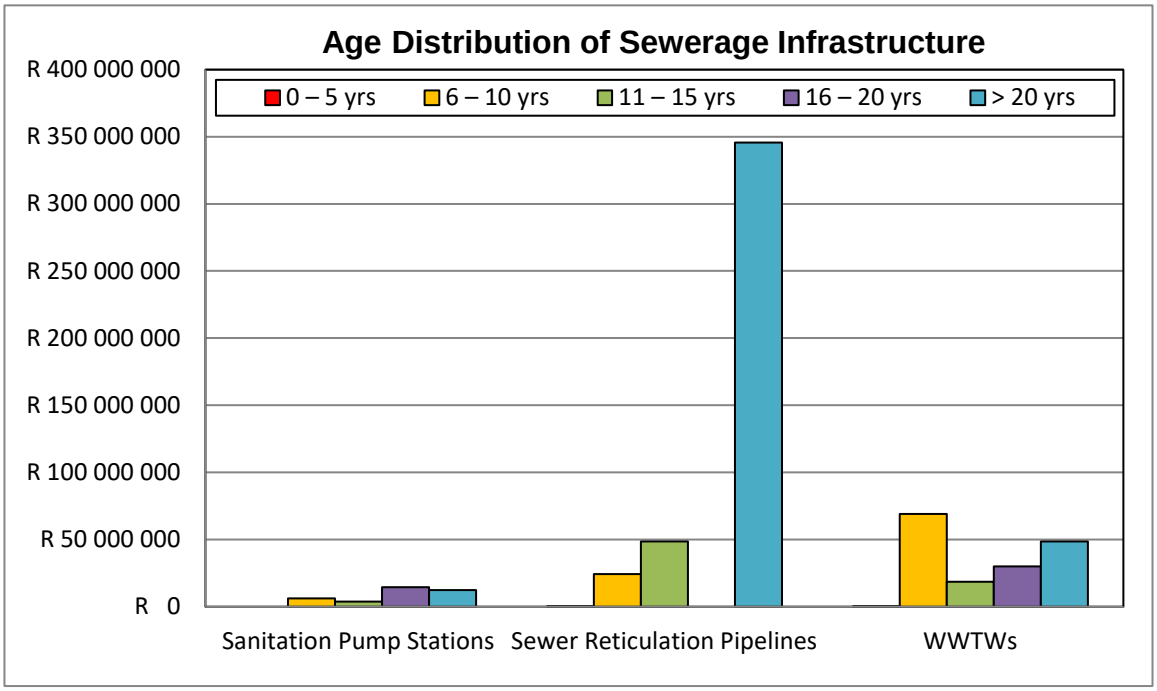


Figure C.6.7: Age Distribution of the Sewerage Infrastructure

Table C.6.8: Overview of the Condition Grading by Facility Type for the Sewerage Infrastructure – June 2023 (CRC)					
Asset Type	**Very Poor**	**Poor**	**Fair**	**Good**	**Very Good**
Condition Grading by Facility Type					
Sanitation Pump Stations	R17 965	R38 148	R32 100 868	R3 057 178	R1 669 932
Sewer Reticulation Pipelines	R4 663 675	R60 105 948	R165 470 719	R143 382 791	R44 806 378
Stanford WWTW	R0	R1 063 582	R11 149 555	R6 350 392	R0
Hermanus WWTW	R8 648 330	R1 802 042	R38 583 831	R17 996 344	R8 635 351
Hawston WWTW	R0	R199 283	R6 585 074	R4 864 349	R1 789 666
Kleinmond WWTW	R25 913	R15 528	R6 906 032	R6 482 723	R0
Gansbaai WWTW	R4 768 779	R722 846	R20 501 243	R6 057 553	R2 085 475
Pearly Beach WWTW	R0	R58 022	R0	R162 383	R10 840 044
Totals	**R18 124 662**	**R64 005 399**	**R281 297 322**	**R188 353 713**	**R69 826 846**

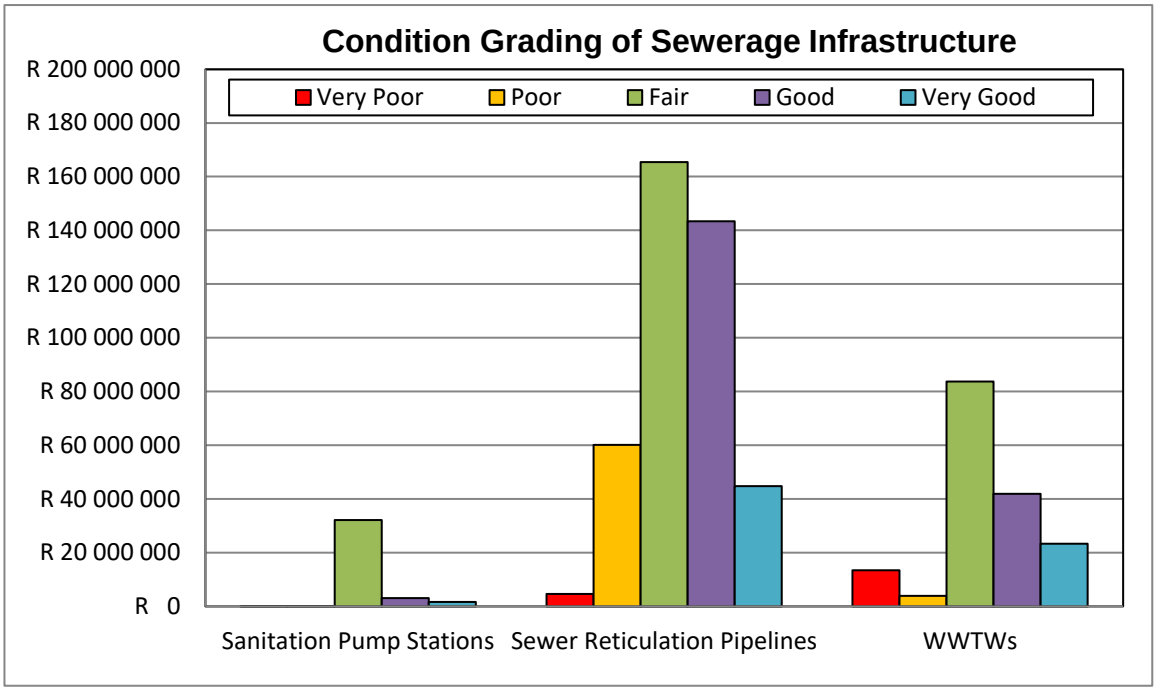


Figure C.6.8: Condition Grading of the Sewerage Infrastructure

The CRC of the water and sewerage infrastructure that will need to be replaced over the next five years (RUL <5 yrs) is R674.743 million. The asset renewal needs for the water infrastructure assets over the next ten years is R65.436 million per year. The reinvestment required is R602.700 million in the first five years and R51.664 million in the second five-year period. The age of 56.9% of the water infrastructure assets is greater than twenty years. The CRC of the water infrastructure with a condition grading of "Very Poor" is R380.493 million. The asset renewal needs for the sewerage infrastructure assets over the next ten years is R17.435 million per year. The reinvestment required is R72.044 million in the first five years and R102.306 million in the second five-year period. The age of 65.4% of the sewerage infrastructure assets is greater than twenty years. The CRC of the sewerage infrastructure with a condition grading of "Very Poor" is R18.125 million.

Some of the key challenges of Overstrand Municipality are to identify adequate funds for the rehabilitation and maintenance of their existing infrastructure, which is critical to ensure the sustainability of the services that are provided by the Municipality. The Water and Wastewater Bulk Works Contract ensures that the new technology installed is adequately maintained and operated in order to prevent a massive increase in maintenance in the future due to backlog being created (Objective is asset preservation). This Bulk Works Contract addresses the capacity constraints, the Municipality previously experienced, with regard to the operation and maintenance of the WTWs and WWTWs (Objectives are skills development and retention and long-term improvement of efficiency of operations).

It is however still important for the Municipality to secure adequate funding for major refurbishment and maintenance work, the provision of bulk infrastructure and development of additional sources to keep up with the high demand for services.

C.7. Water Services Operation and Maintenance

The existing Water and Wastewater Bulk Works Contract assist Overstrand Municipality with the operation and maintenance of their bulk water and sewerage infrastructure. Overstrand Municipality practices the following planned and unplanned preventative and corrective maintenance, as summarised in the table below.

Table C.7.1: Types of Planned and Unplanned Preventative and Corrective Maintenance Implemented by Overstrand Municipality

Design-out Maintenance: Design-out Maintenance originates on the drawing board and is aimed at improving the operation, reliability or capacity of equipment. The engineer follows a life cycle approach to infrastructure development.	
Preventative Maintenance: Preventative maintenance is based on planning. For example, breakdowns at a plant can be reduced to a minimum if it is planned that all wearing parts are to be replaced before they fail.	Systematic (Periodic Maintenance): Systematic maintenance is periodic maintenance where the servicing of equipment takes place at regular intervals, either in accordance with a time schedule or on the basis of predetermined units of use, to eliminate possible causes of failure before a breakdown occurs. Systematic maintenance requires a servicing schedule, which is based on the manufacturer's guidelines for equipment. Condition-based (Predictive) Maintenance: Condition-based maintenance is predictive maintenance based on regularly inspecting equipment and infrastructure in order to assess the state of wear and tear. Any failures that are observed, complemented by the findings of the programmed inspections and checks, are then dealt with through corrective action, so as to avoid breakdowns or the deterioration of a condition that could pose a safety hazard.
Corrective or Breakdown Maintenance: It is important to work methodically to keep repair time as short as possible. Good work preparation, use of correct (and well maintained) tools and equipment, and gathering and processing of all data relevant to the repairs helps to avoid downtime, eliminate mistakes and improve operational conditions.	Planned (Scheduled Repairs) Unplanned repairs guided by Troubleshooting: Troubleshooting is used when poor condition causes either total or partial stoppages, or when operations take place under intolerable conditions.

Overstrand Municipality's operation and maintenance assessments and plans for their water and sewerage infrastructure are indicated in the table below.

Table C.7.2: Overstrand Municipality's Operation and Maintenance Assessments and Plans

Element	Assessment Criteria	Status Quo
Resources		
Staff	Sufficient staff numbers. Competency level of staff at all levels. Level of service provided by staff. Empowerment and training (Adequately trained for position, Safety regulation and Commitment). Responsibility allocation (organisational structure) and acceptance thereof.	Adequate: The Contractor appointed for the Water and Wastewater Bulk Works Contract ensures that the number of Process Controllers at the WTWs and WWTWs are adequate. Workplace Skills Programme is compiled annually to ensure adequate training of staff.
External Resources	Need for external resource providers. Competency level and value for money. Management and control over these providers.	Adequate: Section 78 Assessment Process was completed to appoint the Contractor for the Bulk Works Contract. The Contract is adequately managed by the Engineering Planning Department and the reticulation networks by the Operational Services Department.
Spare Parts	Adequate materials provisioning. Store management (Sufficient stock kept, stock control and delivery time).	Adequate: Contractor of Bulk Works Contract ensure adequate spare parts are available. Monitored by the Engineering Planning Department and managed by the Operational Services Department for the reticulation networks.
Tools and Equipment	Adequate tools and equipment provided. Control and maintenance.	Adequate: Contractor of Bulk Works Contract ensure adequate tools and equipment. Monitored by the Engineering Planning Department and managed by the Operational Services Department for the reticulation networks.

Table C.7.2: Overstrand Municipality's Operation and Maintenance Assessments and Plans		
Element	**Assessment Criteria**	**Status Quo**
Budget	Adequate budget provided. Budget control. Identification and documentation of needs. Budget preparation and motivation.	Adequate: Required Financial Strategies, Policies and Systems are in place to ensure proper budget control.
Information		
Manuals	Existence of manuals (operation / maintenance or manufacturer). Record keeping / safekeeping and control. Utilisation of manuals by staff.	Adequate: O&M Manuals are in place for the bulk water and sewerage infrastructure. These Manuals are also used by the Process Controllers at the treatment plants.
Asset Register	Existence of an asset register. Maintenance / updating of asset register. Accessibility of information. Control over assets. Stock taking.	Adequate: An up-to-date Asset Register is in place, which include all the water and sewerage infrastructure. CRC, DRC, RUL, Age and Condition Gradings are included in the Asset Register. Asset Register is updated annually.
As-built Information	Existence of as-built drawings. Existence of important reports e.g. design reports etc. Record keeping / safekeeping and control. Accessibility of information. Updating of records.	Adequate: As-built information is available for all water and sewerage infrastructure. The information is also included in the IMQS of the Municipality. The information is regularly updated when the Water and Sewer Master Plans are updated.
Tools and Equipment	Existence of information on tools and equipment. Record keeping / safekeeping and control. Accessibility of information.	Adequate: Managed by the Contractor appointed for the Bulk Works Contract. Monitored by the Engineering Planning Department and managed by the Operational Services Department for the reticulation networks.
Contingency and Safety Plans	Compliance to safety requirements. Safety equipment and maintenance thereof. Existence of safety plan where required. Existence of contingency plan where required.	Adequate: Water Safety Plan and W_2RAP are in place. Annual WTW and WWTW Process Audits are also done. Incident Management Protocols, as included in the Water Safety Plan and W_2RAP, are followed by the personnel.
Activity Control and Management		
Procedures	Existence of procedures for all activities. Existence of policies – standardisation, quality, operational and maintenance, etc. Correctness of procedures – if in place.	Adequate: Required Procedures and Policies are in place. Managed by the Engineering Planning and Operational Services Department.
Record Keeping	Existence of record keeping system. Process of data. Actions activated.	Adequate: Record keeping is comprehensive, with all the required information for the WSDP and Water Services Audit Report kept up to date. Contract for the Bulk Works Contract also ensure that all the required information is recorded, as stipulated in the Contract. The information is linked to KPIs with relevant penalties for non-compliance.
Quality Controls	Quality management plan. Quality assurance. Quality control (Inspections, Control charts, trend analysis). Process adjustment and rework. Quality improvement.	Adequate: Required quality control mechanisms are in place to ensure high quality of materials and to ensure that all work carried out on the water and sewerage infrastructure is of a high quality. The Engineering Planning and Operational Services Department monitors all work carried out by Consultants and Contractors.
Risk Management	Risk management planning. Risk identification. Risk probability and impact assessment. Risk response planning. Risk monitoring and control.	Adequate: Required Risk Management Protocols are in place, which is followed by the personnel. Potential risks/incidents and control measure to reduce or manage these risks were identified as part of the Water Safety Plan and W_2RAP processes.
Reporting	Production and activity reporting (Completeness, evaluation and action activation). Management reporting (Completeness and evaluation and action activation). Performance monitoring.	Adequate: The existing Bulk Works Contract and the Engineering Planning and Operational Services Department's own monthly reporting ensure adequate reporting. A SDBIP is also in place, linked to specific water and sanitation KPIs, which allows for proper performance monitoring.

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

Operation and Maintenance Manuals and Emergency Preparedness Plans were drafted for the Mossel River Dam and the De Bos Dam during the 2021/2022 financial year.

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

A budget of approximately 2% of the total asset value per annum should be allocated towards the replacement of existing infrastructure. In the case of the operations and maintenance of the systems, a budget of approximately 1% to 2% of the value of the system is typically required to ensure that the systems remain in good condition. The table below gives an overview of the CRC and CV of the water and sewerage infrastructure included in Overstrand Municipality's Asset Register (June 2023). The recommended budgets for the replacement of the existing infrastructure and the operation and maintenance of the existing infrastructure, based on the CRC, are also indicated.

Table C.7.3: Recommended Budgets for the Replacement and the Operation and Maintenance of the existing Water and Sewerage Infrastructure.

Asset Type	Asset Register June 2023		Required Annual Replacement Budget (Best Practice)	Required Annual O&M Budget (Best Practice)	Depreciation and Asset Impairment Actual Expenditure
	CRC	CV	2.0%	1.5%	2022/2023
Dams	R11 119 399	R4 212 132	R222 388	R166 791	R24 123 324
Boreholes	R11 161 486	R5 210 180	R223 230	R167 422	
Bulk Water Pipelines	R127 078 859	R45 277 466	R2 541 577	R1 906 183	
Pump Stations	R49 252 052	R15 680 482	R985 041	R738 781	
Reservoirs	R120 153 764	R66 182 683	R2 403 075	R1 802 306	
Water Reticulation Pipelines	R681 501 128	R247 737 828	R13 630 023	R10 222 517	
Buffels River WTW	R13 813 820	R4 589 580	R276 276	R207 207	
Kleinmond WTW	R27 568 183	R9 762 759	R551 364	R413 523	
Preekstoel WTW	R78 510 492	R62 746 623	R1 570 210	R1 177 657	
Franskraal New WTW	R36 298 367	R18 413 978	R725 967	R544 476	
Franskraal Old WTW	R20 036 738	R3 222 977	R400 735	R300 551	
Baardskeerdersbos WTW	R6 724 089	R3 355 523	R134 482	R100 861	
Pearly Beach WTW	R8 154 514	R5 049 560	R163 090	R122 318	
De Kelders WTW	R18 982 042	R6 557 326	R379 641	R284 731	
Sub Total Water	**R1 210 354 933**	**R497 999 097**	**R24 207 099**	**R18 155 324**	**R24 123 324**
Sanitation Pump Stations	R36 884 091	R29 419 087	R737 682	R553 261	R20 561 409
Sewer Reticulation Pipelines	R418 429 511	R350 017 326	R8 368 590	R6 276 443	
Stanford WWTW	R18 563 529	R20 671 888	R371 271	R278 453	
Hermanus WWTW	R75 665 898	R31 982 509	R1 513 318	R1 134 988	
Hawston WWTW	R13 438 372	R4 343 407	R268 767	R201 576	
Kleinmond WWTW	R13 430 196	R3 808 595	R268 604	R201 453	
Gansbaai WWTW	R34 135 896	R8 846 322	R682 718	R512 038	
Pearly Beach WWTW	R11 060 449	R6 213 515	R221 209	R165 907	
Sub Total Sewerage	**R621 607 942**	**R455 302 649**	**R12 432 159**	**R9 324 119**	**R20 561 409**
Total Water and Sewerage	**R1 831 962 875**	**R953 301 746**	**R36 639 258**	**R27 479 443**	**R44 684 733**

Most of the major replacement of old water and sewerage infrastructure in Overstrand Municipality is done through the Municipality's annual capital budget. The capital budget however also includes new infrastructure. The table below gives an overview of the total historical water and sewerage capital expenditure for the last five financial years.

Table C.7.4: Historical Water and Sewerage Capital Expenditure

Infrastructure	22/23	21/22	20/21	19/20	18/19
Water	R31 607 552	R36 630 152	R34 573 765	R24 903 681	R12 270 442
Sewerage	R31 123 018	R40 005 632	R30 513 335	R15 641 239	R34 962 591
Total	**R62 730 570**	**R76 635 784**	**R65 087 100**	**R40 544 920**	**R47 233 033**

A **pipe replacement study** was performed for Overstrand Municipality's entire water distribution system (October 2019). The project entailed the verification of system data, establishment of a computer model for the pipe replacement network, performing an analysis and reporting. The pipe replacement potential was determined for each of the pipelines in the water distribution systems by assessing the likelihood of failure (LF) and the consequence of failure (CF). The independent factors and their weight factors used are summarised in the tables below:

Table C.7.5: The Independent Factors and the Weight Factors used to determine the Water Pipe Replacement Potential

Likelihood of Failure Property	Weight	Weight (%)	Consequence of Failure Property	Weight	Weight (%)
Nominal diameter (mm)	6	15.38%	High cost to consumer due to high water pressure (m)	5	11.1%
Reserve water pressure ratio	5	12.82%	High cost to consumer due to flow (l/s)	6	13.3%
Catalogue remaining useful life (yr)	3	7.69%	Extended non-supply over time	0	0.0%
Master Plan Item	6	15.38%	High repair cost	7	15.6%
Assessed condition	0	0.0%	Flooding due to geography	8	17.8%
Failure frequency (breaks/km/yr)	11	28.21%	Strategic location	9	20.0%
Leakage volume (l/min/km)	2	5.14%	Network redundancy (l/s)	10	22.2%
Undesired material	6	15.38%	Pavement management system alignment	0	0.0%
Geology	0	0.0%			
		100.0%			100.0%

The total pipe replacement potential was calculated for each pipeline as an index

PRP = LF x CF (In the range of 1 to 25)

The replacement value for the top 200 pipes to be replaced in Overstrand Municipality is R19.849 million. The location of pipe failures should be recorded with accurate GPS coordinates or with the Wadiso link number as was done for the 2016/2017 and 2017/2018 financial years. It is recommended that pipe replacement in Overstrand Municipality is performed in accordance with the PRP values. Pipes with the highest PRP values should be considered to be replaced first. The table below gives an overview of these pipes.

Table C.7.6: Top Two Hundred Water Pipes in Overstrand Municipality's Water Distribution Systems to be Replaced based on PRP (Pipes with PRP > 98.99%)

Area	System	Length (m)	Replacement Cost
Buffels River	Buffels River	920.61	R816 310-42
Buffels River - Pringle Bay		4 872.24	R2 929 622-88
Buffels River - Rooi Els		329.26	R195 248-58
Buffels River - Sunny Seas PRV 1 zone		193.80	R114 921-99
Buffels River - Sunny Seas PRV 2 zone		248.31	R147 250-55
Buffels River - Sunny Seas Reservoir zone		668.28	R396 292-05
Buffels River - Voorberg PRV zone		1 712.85	R1 104 430-84
Buffels River - Voorberg Reservoir zone		1 485.15	R1 588 544-05
Kleinmond PRV	Kleinmond	1 037.78	R642 228-50
Kleinmond Reservoir		1 749.91	R1 109 588-88

Table C.7.6: Top Two Hundred Water Pipes in Overstrand Municipality's Water Distribution Systems to be Replaced based on PRP (Pipes with PRP > 98.99%)			
Area	**System**	**Length (m)**	**Replacement Cost**
Greater Hermanus	Greater Hermanus	3 627.30	R8 142 925-53
Greater Hermanus - Hawston		138.55	R82 160-16
Greater Hermanus - Hermanus		842.30	R558 226-59
Greater Hermanus - Mount Pleasant		88.75	R52 627-91
Greater Hermanus - Northcliff		69.27	R41 075-97
Greater Hermanus - Onrus		268.91	R159 463-36
Greater Hermanus - Sandbaai		149.84	R102 108-21
Greater Hermanus - Vermont		222.68	R374 125-86
Greater Hermanus - Voëlklip HL		311.17	R252 113-49
Greater Hermanus - Voëlklip LL		206.77	R122 614-32
Stanford PRV	Stanford	27.70	R16 428-17
Stanford reservoir		83.07	R45 271-64
Greater Gansbaai - De Kelders	Greater Gansbaai	1 430.48	R848 276-87
Greater Gansbaai - Franskraal		11.67	R6 921-83
Total		**20 696.65**	**R19 848 778-66**

C.8. Water Resources

The Western Cape experienced a severe drought over the period 2015 to 2017, with some relief during the 2018 to 2022 winter months. The drought over the period 2015 to 2017 reduced the safe yield of the Municipality's own existing surface and groundwater resources. The Municipality therefore continued with the implementation of various WC/WDM measures to lower the current and future water requirements and investigations of augmentation options for the existing water resources.

Future water requirement projection models were developed for each of the towns within Overstrand Municipality's Management Area and are included in Annexure C. IWA Water Balance models with graphs of the total water requirements (bulk raw water volumes, system input volumes and billed metered consumption), peak month factors, annual treatment losses, NRW and water losses per town and water usage per sector are included in Annexure A.

The future water requirement projection models include the future projections up to 2047 and were calibrated by using the historical IWA Water balance data. The percentage of NRW was determined for each of the distribution systems and growth in future water requirement was based on agreed population and growth figures.

Table C.8.1: Projected Future Water Requirements and Yield / Licence Surplus (+) / Shortfall (-) based on WSDP Model						
Distribution System	**Projection**	**PROJECTED FUTURE WATER REQUIREMENTS (Ml/a)**				
		2027	**2032**	**2037**	**2042**	**2047**
Buffels River	2.5% Annual Growth	759.851	859.702	972.674	1 100.492	1 245.105
	3.5% Annual Growth	797.648	947.355	1 125.161	1 336.338	1 587.151
	WSDP Model	745.108	857.817	993.334	1 156.791	1 354.545
	Yield surplus (+) / shortfall (-)	**+971.892**	**+859.183**	**+723.666**	**+560.209**	**+362.455**
Kleinmond	2.5% Annual Growth	1 038.773	1 175.276	1 329.717	1 504.453	1 702.151
	3.5% Annual Growth	1 090.443	1 295.105	1 538.178	1 826.873	2 169.752
	WSDP Model	985.509	1 109.252	1 253.130	1 420.889	1 617.045
	Yield surplus (+) / shortfall (-)	**+1 603.861**	**+1 480.118**	**+1 336.240**	**+1 168.481**	**+972.325**
Greater Hermanus	3.0% Annual Growth	4 946.905	5 734.819	6 648.227	7 707.117	8 934.661
	4.0% Annual Growth	5 191.755	6 316.564	7 685.065	9 350.057	11 375.774
	WSDP Model	4 991.192	6 203.258	7 744.927	9 711.343	12 225.926
	Licence surplus (+) / shortfall (-)	**+1 008.808**	**-203.258**	**-1 744.927**	**-3 711.343**	**-6 225.926**
Stanford	2.5% Annual Growth	563.827	637.919	721.746	816.590	923.896
	3.5% Annual Growth	591.873	702.959	834.895	991.593	1 177.702

Table C.8.1: Projected Future Water Requirements and Yield / Licence Surplus (+) / Shortfall (-) based on WSDP Model						
Distribution System	**Projection**	**PROJECTED FUTURE WATER REQUIREMENTS (Ml/a)**				
		2027	**2032**	**2037**	**2042**	**2047**
	WSDP Model	672.039	813.216	986.980	1 201.093	1 465.185
	Licence surplus (+) / shortfall (-)	**+927.961**	**+786.784**	**+613.020**	**+398.907**	**+134.815**
Greater Gansbaai	3.0% Annual Growth	1 891.196	2 192.414	2 541.609	2 946.421	3 415.710
	4.0% Annual Growth	1 984.801	2 414.814	2 937.991	3 574.515	4 348.944
	WSDP Model	1 813.842	2 137.851	2 536.408	3 028.394	3 637.724
	Yield surplus (+) / shortfall (-)	**+954.139**	**+630.130**	**+231.573**	**-260.413**	**-869.743**
Pearly Beach	2.5% Annual Growth	168.111	190.203	215.197	243.475	275.470
	3.5% Annual Growth	176.474	209.595	248.933	295.655	351.145
	WSDP Model	177.371	220.326	275.486	346.616	438.694
	Yield surplus (+) / shortfall (-)	**+129.529**	**+86.574**	**+31.414**	**-39.716**	**-131.794**
Baardskeer-dersbos	2.5% Annual Growth	21.807	24.672	27.914	31.583	35.733
	3.5% Annual Growth	22.891	27.188	32.291	38.351	45.549
	WSDP Model	17.567	17.661	17.879	18.239	18.768
	Yield surplus (+) / shortfall (-)	**+72.433**	**+72.339**	**+72.121**	**+71.761**	**+71.232**
Buffeljags Bay	2.5% Annual Growth	6.644	7.517	8.504	9.622	10.886
	3.5% Annual Growth	6.974	8.283	9.838	11.684	13.877
	WSDP Model	5.992	6.459	7.058	7.818	8.779
	Yield surplus (+) / shortfall (-)	**+22.391**	**+21.923**	**+21.325**	**+20.564**	**+19.603**

The table below gives an overview of the years in which the annual water requirements are likely to exceed the sustainable yields / license volumes from the various resources.

Table C.8.2: Years in which the Annual Water Requirement will Exceed the Sustainable Yields / License Volumes from the Various Resources				
Distribution System	**Total Sustainable Yield (Y) / License Volume (L) (x 10^6 m^3/a)**	**Annual Growth on 2022/2023 requirement (2.5% or 3.0%)**	**Annual Growth on 2022/2023 requirement (3.5% or 4.0%)**	**WSDP Projection Model**
Buffels River	1.717 (Y)	> 2047 (2.5%)	> 2047 (3.5%)	> 2047
Kleinmond	2.589 (Y)	> 2047 (2.5%)	> 2047 (3.5%)	> 2047
Greater Hermanus	6.000 (L) *	2033 (3.0%)	2030 (4.0%)	2031
Stanford	1.600 (L)	> 2047 (2.5%)	> 2047 (3.5%)	> 2047
Greater Gansbaai	2.768 (Y)	2039 (3.0%)	2035 (4.0%)	2039
Pearly Beach	0.307 (Y)	> 2047 (2.5%)	2043 (3.5%)	2039
Baardskeerdersbos	0.090 (Y)	> 2047 (2.5%)	> 2047 (3.5%)	> 2047
Buffeljags Bay	0.028 (Y)	> 2047 (2.5%)	> 2047 (3.5%)	> 2047

Note * With Gateway, Camphill and Volmoed Well Fields fully operational according to the licensed volumes.

Source Studies: Overstrand Municipality continues with their groundwater monitoring programmes for Hermanus (Hemel & Aarde), Stanford and Baardskeerdersbos.

Buffels River and Kleinmond Areas: Overstrand Municipality completed a detail investigation during 2010/2011 of the water resources for the area from Rooi Els to Kleinmond and the recommendations from the Study will be implemented.

Greater Hermanus Area: The Gateway, Camphill and Volmoed wellfields were developed by Overstrand Municipality as additional groundwater resources for the greater Hermanus Area. These boreholes are in production and the Municipality is maintaining their Groundwater Monitoring Programmes for all their wellfields, in order to comply with the License conditions. The License for the next phase of the Camphill and Volmoed wellfields was also received from the DWS. The Municipality is currently busy with the EIA process for the augmentation of the Hemel & Aarde (Camphill and Volmoed well fields) boreholes.

A Scoping Report was also completed during August 2018 for the "Augmentation of potable water supplies to Hermanus". The report discusses various potable water augmentation schemes for the provision of 3 Ml/d of potable water to Hermanus. The following augmentation schemes were considered:

- Seawater reverse osmosis: This involves the installation of a 3 Ml/d seawater desalination plant, situated on the southern shores of the town, near the Abagold abalone cultivation facility. The desalination plant would share Abagold's existing intake and brine outfall facilities which would reduce the capital investment required. In addition, a prefabricated desalination plant with a low chemical consumption is also preferred which would further reduce the capital and operational costs in comparison to a conventional seawater desalination plant of the same size and purpose.

- Desalination-based direct reuse scheme: This process is based on reclaiming secondary treated effluent sources from the Hermanus WWTW and treated to potable standard.

- Non-desalination based direct reuse scheme: This treatment option has very similar merits to the RO based option. However, the treatment train achieves the required treatment objectives without use of reverse osmosis. Consequently, the treatment train is unable to address the high salinity of the raw water, resulting in the need to pump this water to Preekstoel WTW for sufficient dilution and then distribution.

- Remix scheme: This is a hybrid scheme that involves blending desalinated water with reclaimed water on a 50:50 basis. The option involves combining a 1.5 Ml/d plant with a 1.5 Ml/d non-RO-based reuse plant. The motivation behind this configuration being to diminish the wastewater history of the recovered water as well as to reduce the TDS of the reclaimed water with the seawater permeate. The treated water from this scheme is suitable to be fed to the Hermanus 1&2 reservoirs.

- Palmiet River abstraction: This option involves pumping water from the Palmiet River to the De Bos Dam for augmentation of the raw water supplies to the Preekstoel WTW. The water will accordingly be treated via the existing Preekstoel WTW. Such a scheme will have significant environmental impacts.

- Aquifer recharge: This involves treating secondary effluent from the Hermanus WWTW and then recharging either the fractures rock Table Mountain Group (TMG) aquifer or porous (Quaternary sands) aquifer. However, due to insufficient storage capacity by the aquifer and other reasons discussed in the report, this option was not considered further.

In considering various potable water augmentation schemes for Hermanus, the following conclusions were made:

- Managed aquifer recharge does not seem to be a viable water augmentation solution for Hermanus as the process required to render the reclaimed wastewater suitable for aquifer recharge will be very similar to that of a direct potable water reuse scheme. This makes the option particularly unattractive due to the relatively high treatment costs which would be further compounded by the additional cost of abstracting the water and treating for consumption at a later date. On this basis, it will be better to rather implement a direct potable water reuse scheme before aquifer recharge is considered. In addition, the shallow water levels of the porous media aquifer in the area indicate that the aquifer will be unable to accept the required yield and there is a risk of flooding due to the limited available volume of unsaturated sands;

- The basis of financially ranking the various treatment options will be the cost of delivering a unit volume of treated water. Based on this criterion, abstraction of water from the Palmiet River seems to be most feasible option with a treated water delivery cost of R9.61/m^3 and a capital cost of ~R99,5 million. Included in the treated water delivery cost is the cost of treatment at Preekstoel WTW, which was estimated at R2.50/m^3. Of particular concern to the implementation of such a scheme is the reliability of this water source as the Palmiet river flow is too low during the summer months to accommodate the required 3.6 Ml/d of abstracted water. In addition to the possibility of inadequate water supply, the pipeline route from the abstraction point to the De Bos dam covers extremely sensitive environmental areas and the need to route the pipeline through the coastal town of Kleinmond. Environmental & public approval for construction of such a pipeline may well be a stumbling block for implementation of this option. In addition, a new Water Use License Application (WULA) may well also be required for this

option, while it will trigger a need for environmental authorisation from the Department of Environmental Affairs and Development Planning (DEA & DP). The latter will be difficult to obtain;

- Seawater desalination is the second most feasible solution with a treated water delivery cost of R16.10/m^3 and a capital cost of ~R88.5 million. However, there is an additional surcharge cost that Abagold may charge for using their facilities, which is unknown at this moment. This cost may be charged per volume of abstracted water or as a flat cost, but this is still to be determined. Therefore, Overstrand Municipality will have to discuss this with Abagold and come to an agreement. Once this cost is determined, it will have to be added to the R16.10/m^3 operating cost figure of the seawater desalination process to determine the real cost of this scheme. From an environmental perspective, this option will require an amendment to Abagold's Coastal Water Discharge Permit (CWDP) for brine disposal, while it will trigger a need for environmental authorisation from the Department of Environmental Affairs and Development Planning (DEA & DP);

- The non-desalination-based reuse scheme has a capital cost of ~R122.5 million and an operating cost of R19.45/m^3. This cost could however be reduced if the reclaimed water is not pumped to the Preekstoel WTW for re-treatment via the Preekstoel WTW but rather introduced directly into the reticulation system via the Hermanus Reservoirs 1 & 2, similar to the desalination-based re-use scheme. If so, the capital cost would reduce to ~R118.5 million with an operational cost of R16.35/m^3. This could make it the most feasible scheme after the Palmiet River abstraction option. From a water quality perspective, the treated water from the non-desalination-based reuse scheme will comply with potable water standards, but the salinity will be on the high side. For this reason, blending with an alternative low salinity water source is recommended. Provided that the public perception of the potential risks associated with the elimination of a RO plant barrier as part of the treatment process can be addressed, the water does not require additional treatment and can be directly introduced into the reticulation system. The option of feeding the water to the Preekstoel WTW was made based on the fact that part of the pipeline was already constructed and further knowing that the additional barriers at Preekstoel WTW will give further comfort to the negative stigma of water reuse. From an environmental perspective, the reuse scheme options will require an amendment to Overstrand's Coastal Water Discharge Permit (CWDP), while it will trigger the need for environmental authorisation from the Department of Environmental Affairs and Development Planning (DEA & DP);

- The desalination-based reuse scheme requires a capital investment of ~R151 million and an operating cost of R21.53/m^3. The operational cost would increase with ~R3.00/m^3 to R24.53/m^3 if the water cannot be introduced into the Hermanus reservoirs 1 & 2 but is pumped to the Preekstoel WTW for introduction into the balancing reservoir at Preekstoel. From an environmental perspective, the desalination-based reuse scheme option will require an amendment to Overstrand's Coastal Water Discharge Permit (CWDP), while it will trigger a need for environmental authorisation from the Department of Environmental Affairs and Development Planning (DEA & DP);

- Despite having a slightly lower capital cost (~R147 million) than the desalination-based reuse scheme, the Remix scheme is the most expensive scheme to operate at R21.77/m^3. The operational cost would increase further with ~R3.00/m^3 to R24.77/m^3 if the treated water is not introduced into the Hermanus reservoirs 1 & 2 but rather pumped to the Preekstoel WTW for introduction into the balancing reservoir at Preekstoel. From an environmental perspective, the remix scheme option will require an amendment to Overstrand's Coastal Water Discharge Permit (CWDP), while it will trigger a need for environmental authorisation from the Department of Environmental Affairs and Development Planning (DEA & DP);

- The Hermanus wastewater treatment plant site assessment has identified the need for maintenance activities on certain components of the wastewater treatment plant. When considering a reuse scheme, the need to undertake maintenance on the wastewater treatment plant that feeds the reuse plant should also be considered as part of the capital outlay for a reuse scheme as the latter would rely on a stable source water supply. The site assessment undertaken by Zutari has identified the need to spend at least ~R17 million on maintenance activities. Whilst one can argue that maintenance on the wastewater treatment plant would be required in any event, it would not be that critical if the wastewater is discharged to sea. A reuse plant on the other hand relies on a stable quality water and without a proper functioning wastewater treatment plant, it would not be an option to consider.

- It was recommended that a further investigation is undertaken to explore the feasibility of utilising renewable energy as a potential energy source to support a seawater desalination plant. This would be the only way to reduce the operation cost of a SWRO plant. Some of the available renewable energy technologies have already been tested in Hermanus and although there is not excess energy available for the desalination or reuse plants from these sources, it is worth looking into it as a potential source (or partial source). There has also been significant technology development in harvesting wave energy and if such a system can be installed, SWRO may well just prove to be a very cost-effective solution for Hermanus;

- Overstrand Municipality completed a separate seawater sampling program over a 12-month period to confirm the design parameters for a SWRO plant.

The following additional work was completed during October 2019, after the completion of the previously mentioned “Augmentation of potable water supplies to Hermanus” Scoping Report.

- Sea water quality tests: The collection of at least twelve (12) water samples over a twelve (12) month period was proposed and to have these samples analysed comprehensively by an accredited laboratory (completed).

- Renewable energy options: An investigation into available renewable energy options to reduce the impact of the electricity price on the overall operational cost of the desalination plant was explored. Various renewable energy options such as wind, hydro, biomass, wave energy and solar energy were investigated. The suitability of applying these renewable energy options to power a SWRO plant was considered with the following conclusions:

  - Wind technology is not recommended due to the length and complexity of permitting and uncertainty around technology options for small scale self-generation.
  - Hydro technology is not recommended due to high site establishment and capex costs.
  - Biomass digesters are a possible innovative solution; however, the quantity and quality of the abalone farm waste may make this technology unreliable.
  - Whilst there has been tremendous growth in wave & tidal energy over the last decade, it is not yet mature enough to move forward in securing a reliable power supply. The construction costs are simply too high for it to be competitive with well-established renewable energy options such as wind or solar.

  Based on the feasibility study, solar PV is the most viable renewable energy resource. Integrating a battery energy storage system with Solar PV for days when there is inadequate sunlight and to run the SWRO plant during the night is unfortunately an expensive option for the SWRO plant, given the current overall costs of installing and operating a battery energy storage system. It was recommended that a thorough investigation be done regarding the energy mix of the plant and how to optimize the generation to best fit the load requirements.

- Electricity cost sensitivity analysis: Changes less than 40% in the base electricity price of R1-30/kWh will not have a significant impact on the final cost of desalinated water. A 40% increase in the electricity price will only lead to a 15% increase in the overall cost of producing potable water via SWRO desalination. An electricity price increase as high as 65% will lead to an operating cost increase of 35%, where the cost of producing water will then approach R25/kl. For higher plant capacities, electricity price fluctuations are slightly less sensitive on the final cost of desalinated water so the impact would be less.

  However, in order to optimise the high portion that energy consumption has on the overall operating costs, it was recommended to investigate the use of demand-side management tools by utilising Eskom’s time-of-use power tariff structures. Additionally, energy recovery devices as well as supplementation with renewable energy could also play a major role in reducing electricity costs. Augmenting grid power with PV plus storage to drive desalination carries a price premium, but also provides an important benefit, namely, an energy storage facility that can provide dispatchable electricity.

- Contracting modes: Overstrand Municipality will need to carefully weigh the risks associated with all project delivery methods and choose a contract mode that will provide desalinated water reliably and cost-effectively to its consumers.

- Recommended water price plan: The operational cost of a seawater reverse osmosis plant was calculated at R16-50/m³. An availability charge may well also have to be added to this price and can be discussed. The price of water should of course also be reviewed on an annual basis to allow for yearly inflation cost.

- Suitability of earmarked SWRO site: The identified 9000m² vacant land is more than adequate for the potential construction of a SWRO plant. Currently some challenges are being experienced with regard to the availability of land for the plant, which will need further investigation and negotiations.

Stanford: The Municipality explored the groundwater potential of the Kouevlakte area since 2009, through exploration borehole siting and drilling. Two newly drilled boreholes were put into operation and new bulk supply pipelines were constructed during the 2011/2012 financial year in order to connect the two newly drilled boreholes to the existing water reticulation network. Irrigation of sports fields with treated effluent from the Stanford WWTW was also investigated. The current supply from the Spring and the two boreholes are adequate to meet the medium- and long-term future water requirements of Stanford.

Greater Gansbaai: A Reverse Osmosis Filtration Plant was constructed during the 2010/2011 financial year in order to fully utilise the Klipgat and Grotte resources and improve the quality of the water. Resource augmentation options will be investigated in the future in order to meet the medium- and long-term future water requirements for the greater Gansbaai area.

Pearly Beach: Overstrand Municipality is committed to manage the dam efficiently. Other future resource options include groundwater development and the possible Kraaibosch scheme.

Baardskeerdersbos: Two boreholes were commissioned and the supply from these boreholes will be adequate to meet the medium- and long-term future water requirements. The supply from the stream will only be utilised as a back-up supply when necessary.

Buffeljags Bay: The current supply from the borehole is adequate to supply the medium- and long-term future water requirements of Buffeljags Bay.

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

Table C.8.3: Potential Future Water Resources for the Various Towns (Summary of DWS's All Towns Reconciliation Strategies)

Distribution System	Recommended Summary Options
Betty's Bay, Rooi Els and Pringle Bay	**The current water sources have adequate supply to cater for the medium and longer term future water requirements. The following sources are identified as potential sources to augment the water supply (In order of priority and implementation sequence):** • Continue with the implementation of the WC/WDM Strategy and measures. • Groundwater development in the TMG Aquifer. • Raising of Buffels River dam wall • Abstraction from the Palmiet River • Abstraction from the Rooi Els River
Kleinmond	**The current water sources have adequate supply to cater for the medium and longer term future water requirements. The following sources are identified as potential sources to augment the water supply in the future if required (In order of priority and implementation sequence):** • Continue with the implementation of the WC/WDM Strategy and measures. • Increase allocation from the Palmiet River, when required. • **Regional scheme with Overberg Water for possible bulk supply from the Theewaterskloof Dam.**
Hermanus	**Hermanus will experience a shortfall by 2030 in water supply under all growth scenarios. This will**

Table C.8.3: Potential Future Water Resources for the Various Towns (Summary of DWS's All Towns Reconciliation Strategies)	
Distribution System	**Recommended Summary Options**
	increase to 2.874 million m^3/a by 2040 under the low-growth scenario and to 8.632 million m^3/a under the high-growth scenario. The following sources are identified as potential sources to augment the water supply in the future if required (In order of priority and implementation sequence): • Full implementation of the WC/WDM Strategy and measures. • **Develop groundwater to its full potential (Licenced volumes).** • **Desalination of seawater.** • **Regional scheme with Overberg Water for possible bulk supply from the Theewaterskloof Dam or the Palmiet River.** • Direct and indirect potable water re-use.
Stanford	**The current water sources have adequate supply to cater for the medium and longer term future water requirements, if the Municipality continues with the full implementation of their WC/WDM Strategy. The following sources are identified as potential sources to augment the water supply in the future (In order of priority and implementation sequence):** • Continue with the implementation of the WC/WDM Strategy and measures. • Further Kouevlakte Wellfield development, if required.
Greater Gansbaai	**The current water sources have adequate supply to cater for the medium and longer term future water requirements. The Kraaibosch Dam will provide for Gansbaai until 2030. The following sources are identified as potential sources to augment the water supply in the future if required (In order of priority and implementation sequence):** • Continue with the implementation of the WC/WDM Strategy and measures. • Groundwater development in the TMG Aquifer. • Re-use of water
Pearly Beach	**The current water sources have adequate supply to cater for the medium and longer term future water requirements up to 2030. The following sources are identified as potential sources to augment the water supply in the future if required (In order of priority and implementation sequence):** • Continue with the full implementation of the WC/WDM Strategy and measures. • Groundwater development, if required.
Baardskeer-dersbos	**The current water sources have adequate supply to cater for the medium and longer term future water requirements. If the town may require alternative water resource options in the future, the following sources were identified as potential sources to augment future water requirements (In order of priority and implementation sequence):** • Continue with the full implementation of the WC/WDM Strategy and measures. • Further groundwater development, if required.
Buffeljags Bay	**The current water sources have adequate supply to cater for the medium and longer term future water requirements. If the town may require alternative water resource options in the future, the following sources are identified as potential sources to augment future requirements (In order of priority and implementation sequence):** • Continue with the full implementation of the WC/WDM Strategy and measures. • Further groundwater development, if required.

Industrial Effluent Monitoring:

The Municipality completed the updating of their Water Supply and Sanitation Services By-law. The updating includes the reviewing of the charges that need to be paid by the industrial consumers for the quality of final effluent discharged into the municipality's sewer system by them. The Municipality liaise with the industrial consumers from time to time with regard to the quality of final effluent discharged by them. Industrial effluent quality sample results are received by the Municipality for private package plants that discharge effluent into the Municipality's sewer system or into the environment.

C.9. Water Services Institutional Arrangements and Customer Services

Overstrand Municipality is the official WSA for the entire Municipal Management Area and act as the WSP for the whole area. Current water services are delivered by way of an internally operated and managed mechanism. A Water and Wastewater Bulk Works Contract commenced on the 8th of December 2018 between Overstrand Municipality and Veolia Services Southern Africa (Pty) Ltd to operate and maintain the bulk infrastructure in Overstrand Municipality's Management Area for a period of fifteen (15) years. The Municipality also has the right to extend the contract for a further five (5) years.

Overstrand Municipality updated their WSDP during the 2021/2022 financial year. The new WSDP is for the 2022-2027 five-year WSDP cycle and was approved by Council on the 31st of May 2022. The WSDP IDP Water Sector Input Report was also compiled as part of the updating of the WSDP. The Municipality will compile a new WSDP IDP Water Sector Input Report for 2024/2025 early in 2024. The Municipality updated their existing Water Supply and Sanitation Services By-law during the 2020/2021 financial year. The updated Water Supply and Sanitation Services By-law was advertised for public comment, where after it was finalised and gazetted.

Overstrand Municipality continues to undertake basic public awareness programmes. The education of users where sanitation facilities are upgraded to waterborne systems is on-going. This is primarily focused on informing users of the appropriate use of and routine maintenance of such facilities. Specific awareness interventions are also targeted at primary schools.

The approved organogram for the municipality had 1 092 filled and 108 vacant posts at the end of June 2023, resulting in a vacancy rate of 9.9% for the 2022/2023 financial year. The actual positions filled, and the vacancy rates are indicated in the table below by post level and by functional level for the last three financial years.

Table C.9.1: Positions Filled and Vacancy Rates of Overstrand Municipality for the Last Three Financial Years

Per Post Level	2022/2023			2021/2022			2020/2021		
	Filled	Vacant	% Vacant	Filled	Vacant	% Vacant	Filled	Vacant	% Vacant
MM &MSA section 57 & 56	6	1	16.7%	7	0	0.00%	7	0	0.0%
Middle management **(T14-T19)**	62	6	9.7%	64	4	5.9%	66	2	2.9%
Admin Officers **(T4-T13)**	669	91	13.6%	662	89	11.9%	661	81	10.9%
General Workers **(T3)**	355	10	2.8%	360	10	2.7%	361	9	2.4%
Total	**1 092**	**108**	**9.9%**	**1 093**	**103**	**8.6%**	**1 095**	**92**	**7.8%**
Per Functional Level	**2022/2023**			**2021/2022**			**2020/2021**		
	Filled	**Vacant**	**% Vacant**	**Filled**	**Filled**	**% Vacant**	**Filled**	**Vacant**	**% Vacant**
Municipal Manager	10	3	30.0%	11	2	15.4%	11	2	15.4%
Management Services	49	5	10.2%	49	7	12.5%	49	4	7.5%
Financial Services	103	11	10.7%	100	14	12.3%	101	13	11.4%
Community Services	644	46	7.1%	653	37	5.4%	651	40	5.8%
Protection Services	150	25	16.7%	150	19	11.2%	151	14	8.5%
Infrastructure and Planning Services	128	12	9.4%	125	16	11.3%	125	12	8.8%
Economic Development Services	8	6	75.0%	5	8	61.5%	7	7	50.0%
Total	**1 092**	**108**	**9.9%**	**1 093**	**103**	**8.6%**	**1 095**	**92**	**7.8%**

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

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

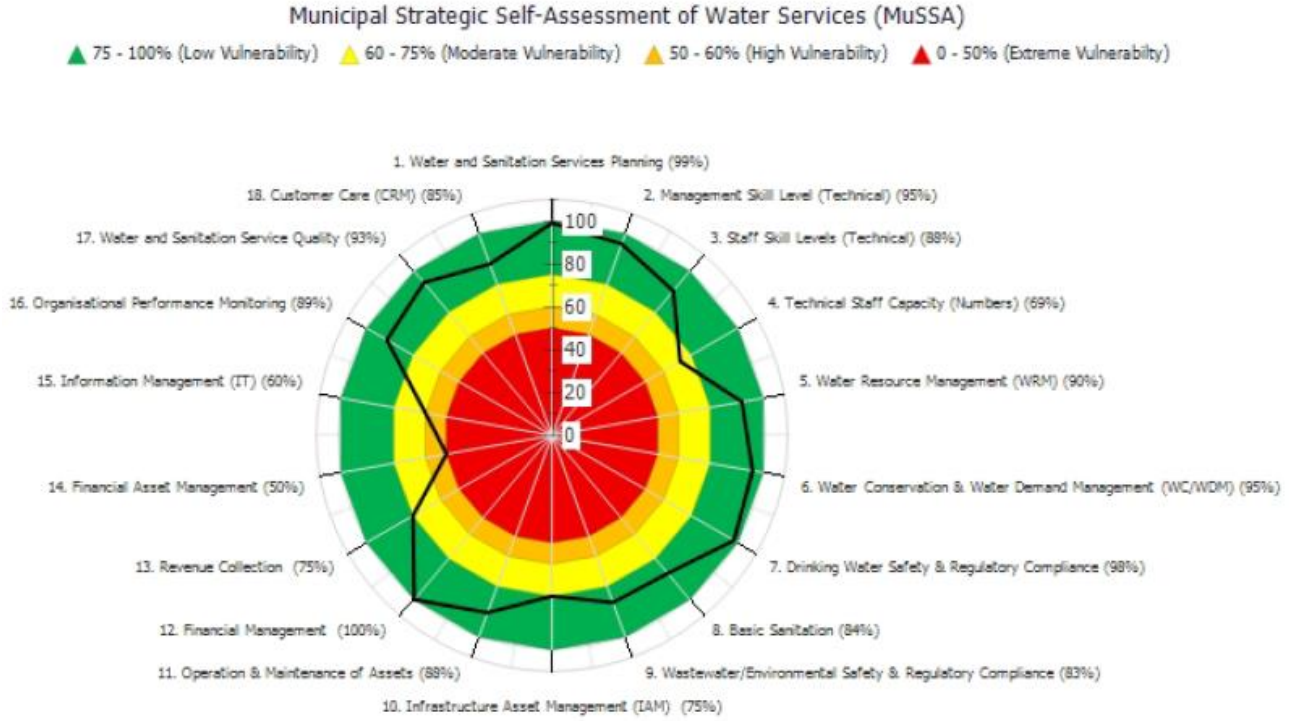


Figure C.9.1: Spider Diagram of the Vulnerability Levels of Overstrand Municipality for 2023

Overstrand Municipality's Vulnerability Index for 2023 was indicated as 0.23 "Low Vulnerability". The only area of concern evident from the 2023 assessment is Financial Asset Management (High Vulnerability, 50.0%).

Table C.9.2: Municipal Strategic Self-Assessment (MuSSA) of Water Services for Overstrand Municipality

Section	Vulnerability
Water and Sanitation Service Quality • Critical business databases and documents (e.g. as-built drawings, records, manuals, agreements, billing/revenue collection, project and scheme management data, etc.) are current, maintained and stored in secure locations (on-site and off-site, both paper and electronic). • Customers have a functional, reliable and safe water supply system with sufficient quantity and flow, good quality and minimal interruptions. • All consumers served experience interruptions of less than 48 hours (at any given time) and a cumulative interruption time during the year of less than 15 days. • Households in your WSA experience water pressure problems (no flow/partial flow less than 10 litres / minute) (not to be confused with interruption to supply). • Customers have a functional, reliable, dignified and safe sanitation system with no blockages resulting in overflows that impact on the environment, including effective collection and treatment of faecal sludge.	**Low (93.0%)**
Customer Care • A functional customer service system manned by appropriate customer services representatives and using a complaints register, is in place to address complaints and appropriately inform customers of service interruptions, contamination of water, boil water alert, etc. • Regular municipal wide customer satisfaction surveys are conducted to determine customer satisfaction levels and inform the Customer Care Management Plan. • Please indicate what percentage of the reported water related complaints/callouts are acknowledged, including consumer response, within 24 hours. • Please indicate what percentage of the reported wastewater/sanitation related complaints/callouts are	**Low (85.0%)**

Table C.9.2: Municipal Strategic Self-Assessment (MuSSA) of Water Services for Overstrand Municipality	
Section	**Vulnerability**
acknowledged, including consumer response, within 24 hours. • A comprehensive customer awareness programme (informing customers of water and wastewater system O&M activities, water quality, resource protection / pollution, reporting incidents / security concerns, etc.) is in place and implemented.	
Water and Sanitation Services Planning • Your appropriate water and sanitation services planning (e.g. WSDP) and associated master planning processes include and are aligned with appropriate Water and Sewage Master Plans, Spatial Development Framework, Water Safety Plans and Wastewater Risk Abatement Plans (W_2RAPs), and are aligned to your IDP and associated SDBIP targets. • You are implementing an up-to-date and adopted municipal water and sanitation services plan (e.g. WSDP). • Your current project list addresses existing needs / shortcomings identified through the WSDP and associated master planning process. • Project progress is monitored, tracked and reported to municipal top management / council and the Regulator (through the annual water and sanitation services report). • Projects identified through your various planning processes have been implemented in the last 3 years.	**Low (99.0%)**
Water Resource Management (WRM) • The recommendations and actions from the Reconciliation Strategies (Large Systems / All Towns) have been incorporated into your WSDP, master planning and IDP processes. • The metered quantity of water available from the resources is sufficient for your future WSA needs (at the stipulated level of abstraction and assurance of supply and considering possible climate change impacts) (i.e. no shortage in 10 years). • The quantity of water available from the resources is sufficient for your future WSA needs (at the stipulated level of assurance of supply) (i.e. no shortage in 10 years). • The source water quality is currently acceptable for its purpose. • The trend indicates a deteriorating source water quality.	**Low (90.0%)**
WC/WDM • Your WSA has developed a council approved WC/WDM Strategy, which includes a standard water balance (e.g. modified IWA). • Please indicate your percentage Non-Revenue Water (NRW) as per the modified IWA water balance. • System input volumes (bulk) to the WSA are accurately monitored using calibrated bulk meters (e.g. check metering). • Please indicate what percentage of all connections are metered and billed (residential and non-residential (commercial, industrial, etc.)) on a monthly basis. • Your WSA is implementing appropriate intervention programmes to reduce NRW (e.g. minimisation of night flows through pressure management, removal of unlawful connections, leak detection and repairs, consumer education / awareness).	**Low (95.0%)**
Drinking Water Safety and Regulatory Compliance • Please indicate your microbiological drinking- water quality compliance for E.Coli (or faecal coliforms) for the communities you are monitoring for the last 12 months. • ALL your supply schemes, WTWs, process controllers, monitoring programmes, sample points, laboratories, results, procedures, protocols, etc. are managed with a suitable Water Safety Planning framework. • Council have been made aware of high risk / critical water safety plan related issues (including those identified via the Blue Drop Certification programme) that require budget and auctioning, and these issues have been actioned (where applicable). • Sufficient funds have been made available to address all these identified water safety related issues. • Required corrective actions/remedial measures to address all these identified water safety related issues have been successfully implemented.	**Low (98.0%)**
Basic Sanitation • You have formal housing areas that are not fully serviced with sanitation infrastructure. • You have informal housing or rural areas that are not fully serviced with sanitation infrastructure. • You have a detailed plan and programme to provide safe sanitation to all households (including health and hygiene education and user awareness including Water, Sanitation and Health (WASH) aspects).	**Low (84.0%)**

Table C.9.2: Municipal Strategic Self-Assessment (MuSSA) of Water Services for Overstrand Municipality	
Section	**Vulnerability**
• Your sanitation budget is appropriate for required sanitation programmes (implementation and O&M). • You are servicing your basic sanitation facilities (e.g. pit latrines) as per safe sanitation requirements (healthy, environmentally safe, structurally sound, regularly maintained, following faecal sludge management best practices).	
Wastewater / Environmental Safety and Regulatory Compliance • Please indicate your treated wastewater effluent compliance for COD for your (or your service provider's) WWTWs for the last 12 months. • ALL your WWTWs, process controllers, monitoring programmes, sample points, laboratories, results, procedures, protocols, etc. are managed with a suitable wastewater risk abatement framework. • Council have been made aware of all W_2RAP related issues (e.g. pollution incidents, Green Drop deficiencies) that require budget and auctioning, and these issues have been actioned (where applicable). • Sufficient funds have been made available to address all identified wastewater and environmental safety related issues. • Required corrective actions/remedial measures to address all identified wastewater and environmental safety related issues have been successfully implemented.	**Low (83.0%)**
Infrastructure Asset Management • You have an appropriate and up-to-date water and sanitation services technical Asset Register (includes asset name, location, condition, extent, remaining useful life, performance and risk). NOTE: This does only not refer to GRAP17 asset register requirements. • You have developed an appropriate Infrastructure Asset Management (IAM) Plan for your WSA. • You are implementing the IAM outcomes. • Budget allocated to implement IAM outcomes is sufficient and is being effectively spent. • You conduct annual technical assessments of your water and wastewater related systems (including sources, WTWs, WWTWs, pump stations, network, etc.) and implement required follow-up actions.	**Low (75.0%)**
Operation and Maintenance of Assets • Appropriate maintenance facility(ies) that is (are) secure and stocked with essential equipment (e.g. spare parts), plant and tools is (are) available. • Appropriate water and sanitation services infrastructure / equipment planned / preventative maintenance schedules are developed. • Appropriate planned / preventative maintenance is performed at all WTWs and associated reservoirs, pump stations and distribution networks. • Appropriate planned / preventative maintenance is performed at all WWTWs and associated collection systems and pump stations. • Please indicate your infrastructure repairs and maintenance costs as a function of total operating expenditure (%).	**Low (88.0%)**
Information Management • You have a developed, approved and implemented IT Master Systems Plan (e.g. covering 3-5 years) that addresses your IT business requirements. • You have a developed, approved and implemented ICT Technology Master Plan that addresses your current and future IT infrastructure requirements. • You have IT systems that support your full range of water and sanitation services business requirements (e.g. billing, GIS, customer care, O&M, asset management). • ICT service continuity – Adequate IT security exists with off-site back-ups / archiving of operation critical applications, databases, data, etc. routinely performed in terms of an IT disaster Recovery Plan. • You have sufficient budget and staff to keep key IT systems table and up to date as per IT policies and procedures.	**Moderate (60.0%)**
Organisational Performance Monitoring • Appropriate plans, policies and procedures to address Disaster Management / emergencies and other issues (safety, public participation, communication, etc.) are developed and implemented. NOTE: Although Disaster Management is a district function, LMs need to ensure they are aware of their associated roles and responsibilities and have developed a Disaster Management Framework. • An organisational performance management system is developed and implemented (i.e. effectively measure, monitor and track water and sanitation services performance indicators).	**Low (89.0%)**

Table C.9.2: Municipal Strategic Self-Assessment (MuSSA) of Water Services for Overstrand Municipality	
Section	**Vulnerability**
• A municipal risk management framework is developed and implemented and includes monitoring and tracking of water and sanitation related risks. • Effective administration support is available to technical staff to assist with processing work orders, providing order numbers, handling correspondence, etc. • "Access to Basic Water and Sanitation Services" progress reports are frequently produced and presented to council for discussion, action and follow-up.	
Financial Management • Financial controls - Please state the audit opinion with regard to your last audit report on the financial statements. • Cash flow status – Please state your Cash / Cost Coverage Ratio (excluding Unspent Conditional Grants) • Your actual operating expenditure closely reflects your budgeted operating expenditure (i.e. Operating Expenditure Budget Implementation Indicator). • Your actual revenue closely reflects your budgeted operating revenue (i.e. Operating Revenue Budget Implementation Indicator). • Liabilities (Creditors) - Money is owed by your municipality to major / critical service providers (e.g. ESKOM, Water Board, largest contractors, etc.) for more than 30 days from receipt of invoice (NOTE: Ignore disputed invoices).	**Low (100.0%)**
Revenue Collection • Please indicate the frequency of actual consumer meter readings. • Net Surplus / Deficit – Please state your net surplus / deficit from water services activities for the last 12 months (NOTE: This question tests whether your WSA currently has fully cost reflective Water and Sanitation Tariffs, which take into account cost of maintenance and renewal of purification plants and networks and the cost of new infrastructure). • Revenue collections - Please state the revenue collection rate in respect to Water and Sanitation Services (%). • Revenue Growth – Please state your Water and Sanitation Services revenue growth for the last 12 months (%). • Grant dependency – Actual-operating revenue less operational grants / subsidies (e.g. equitable share) sufficiently covers actual operating expenditure.	**Low (75.0%)**
Financial Asset Management • Capital Expenditure (Municipal). Please state your municipal Capital Expenditure as a percentage of Total Expenditure (i.e. Total Operating Expenditure + Capital Expenditure). • Capital Expenditure (Water Services). Please state your Capital Expenditure on Water and Sanitation Services as a percentage of Total Capital Expenditure (Capital Expenditure (Municipal)). • Asset Renewal. Please state your Asset Renewal investment as percentage of Depreciation Costs. • Repairs and Maintenance. Please state your Repairs and Maintenance expenditure as a percentage of Property, Plant and Equipment, Investment Property (Carrying Value). • Grant funding of capital expenditure – Please state your reliance on grant funding.	**High (50.0%)**
Management Skill Level (Technical) • Your council approved technical management organisational organogram meets your business requirements, and key posts are filled (e.g. Technical Director, Water Services Manager, and Sanitation Services Manager). • You have sufficient technical management and technical support staff. • Technical management and technical support staff have the correct skills / qualifications and experience as per Job Description requirements (e.g. if Job Description requires Pr Eng, Pr Tech or CPM, the staff have these qualifications). • Managers and technical support staff regularly attend appropriate water and sanitation services skills development / training to support professionalisation. • Key technical managers (e.g. Section 56 and other Senior Management) have signed and monitored Performance Agreements.	**Low (95.0%)**
Staff Skill Levels (Technical) • WTWs are operated by staff with the correct skills / qualifications and experience (as per Regulation 2834). • WWTWs are operated by staff with the correct skills / qualifications and experience (as per Regulation 2834). • Water system plumbers, mechanics and electricians have the correct skills / qualifications and experience. • Sewage system plumbers, millwrights, mechanics and electricians have the correct skills/qualifications and	**Low (88.0%)**

Table C.9.2: Municipal Strategic Self-Assessment (MuSSA) of Water Services for Overstrand Municipality	
Section	**Vulnerability**
experience (including contractors / outsourced resources). • Staff regularly attend appropriate water services skills development / training (including safety) (e.g. ESETA courses).	
Technical Staff Capacity (Numbers) • Your council approved technical staff organisational organogram meets your business requirements, and posts are filled (i.e. Superintendent of WTWs / WWTWs and below). • WTWs are operated by the appropriate number of staff (as per Regulation 2834). • WWTWs are operated by the appropriate number of staff (as per Regulation 2834). • You have sufficient water and sewerage/sanitation network operations and repair staff/plumbers including contractors / outsourced resources (i.e. you have the appropriate number of staff). • An active mentoring/shadowing programme is in place where experienced staff train younger, inexperienced municipal staff.	**Moderate (69.0%)**

The Municipal personnel and the bulk water services contractor's personnel are continuously exposed to training opportunities, skills development and capacity building at a technical, operations and management level in an effort to create a more efficient overall service to the users. A Workplace Skills Plan is compiled every year and the specific training needs of the personnel, with regard to water and wastewater management are determined annually. The Actual training expenditure for the 2022/2023 financial year was R1.956 million. The following training was provided during the 2022/2023 financial year, as included in the Municipality's Workplace Skills Plan.

Table C.9.3: Training Provided during the 2022/2023 Financial Year (Workplace Skills Plan)				
LGSETA Strategic Focus Area	**Municipal Key Performance Area**	**Female Employed**	**Male Employed**	**Total**
Enhancing Good Governance, Leadership and Management Capabilities	Good Governance and the linking of democracy	33	74	107
Promoting Sound Financial Management & Financial Viability	Municipal Financial Viability and Management	40	44	84
Enhancing Infrastructure and Service Delivery	Basic Service Delivery and Infrastructure Development	15	123	138
Enhancing Municipal Planning	Municipal Transformation and Institutional Development	0	0	0
Promoting Spatial Transformation and Inclusion	Sustainable Local Economic Development	0	0	0
Total		**88**	**241**	**329**

It is important for Overstrand Municipality to allocate adequate funding for the rehabilitation and maintenance of the existing infrastructure and all forward planning for new infrastructure should be guided by the Water and Sewer Master Plans.

In line with Overstrand Municipality's Vision – **to be a centre of excellence to the community** – the Municipality has developed a comprehensive customer care strategy. The strategy has now rolled out into consumer services charters for the following departments: electricity, water and sanitation, solid waste management and roads and storm water.

Overstrand Municipality completed a snap community survey during the 2021/2022 financial year. 2 574 People participated in the structured questionnaire. The performance indicated as satisfactory were 67% for water supply and 75% for sewerage provision. The percentage indicates the proportion of those surveyed that believed that the relevant performance was at least satisfactory.

The consumer services charter for water and sanitation includes the following commitments with regard to water services quality and service standards.

Our Purpose: To provide consumers with potable water and appropriate sanitation services.

Water Services Quality:

- We commit ourselves to supply – where the infrastructure allows – water that meets the standards set out for drinking water (SANS 0241) and treat effluent to a standard prescribed by law before disposal thereof into our water sources.
- We have a water quality management programme in terms of which potable water is frequently sampled at various places and tested by an independent accredited laboratory. The results of our treated water and effluent analyses are reported monthly to the Department of Water and Sanitation and thus monitored nationally.
- We strive to obtain Blue Drop status for all our water supply systems and Green Drop status for all our wastewater systems when the National Department continues with these programs.

Vacuum Tanker Service:

- Overstrand Municipality is rendering a vacuum tanker service to properties in Gansbaai, Stanford, Hermanus and Kleinmond areas where no sewer networks are installed.
- Affected clients must monitor the sewer levels of their conservancy tanks and submit a request for service at least 72 hours before capacity of a tank is reached.
- Last-mentioned action will also promote the scheduling of requests (jobs) to be executed by the Administration.

Our Service Standards: We will

- Respond to any reports about poor water quality within 12 business hours;
- Ensure that prolonged water supply interruptions (12 hours) are not more than 3 times per annum;
- Give 2 days prior notice in case of planned interruptions;
- Have an alternative supply of water available to meet basic needs in case of unplanned interruptions that last longer than 24 hours;
- Install new connections within 30 days or receiving the application and all prescribed requirements have been met;
- Clean up sewer overflows due to blockages in our system failure within 24 hours;
- Report the spillage of sewerage in a watercourse or sea to the relevant authorities within 24 hours of such occurrence;
- Promote the use of alternative water sources for irrigation and industry. Note that the use of grey water is allowed, but we may inspect such use and impose conditions;
- Upgrade and monitor telemetry systems, to act as an early warning system for e.g. pipe failures, reservoir overflows and sewer pump stations failures;
- Replace old consumer water meters in phases;
- Test water meters on request. If the meter complies with the specifications the consumer will be liable for the cost thereof. If the meter is faulty, there will be no cost for the consumer;
- Monitor and investigate individual municipal users, consumption on a monthly basis; and
- Monitor and investigate abnormal high or low water consumption of consumers.
- Ensure that all requests for vacuum tanker services are rendered within 72 hours of receipt of requests by the Administration.

- Requests for vacuum tanker services received by the Administration after 15:00 to be executed after 16:30 on the same day must receive preference and will be charged at the applicable after hour tariffs.

A comprehensive Customer Services and Complaints system is in place at Overstrand Municipality. The Municipality has maintained a high and a very consistent level of service to its urban water consumers. Help-desks were developed at all the municipal administrations with the objective to assist customers. Disabled people are supported to do business from the help-desks. Requests by the illiterate are being captured and forwarded to the relevant official / section. All municipal buildings are accessible and wheel-chair friendly.

After hour emergency requests are being dealt with by the control room on a twenty-four hour basis. Requests are furthermore captured on an electronic works-order system to ensure execution thereof. All help desks were equipped with Batho Pele picture signage.

The table below gives an overview of logged queries/complaints responded to within 24 hours for the last three financial years by the various Departments (July to June).

Table C.9.4: Queries/Complaints Responded within 24 Hours by the Various Departments for the last three financial years

Department	2022/2023			2021/2022			2020/2021		
	Total received	Completed within 24 hours	Percentage completed within 24 hours	Total received	Completed within 24 hours	Percentage completed within 24 hours	Total received	Completed within 24 hours	Percentage completed within 24 hours
Sewer	913	940	97.1%	867	896	96.8%	863	831	96.3%
Tankers	647	890	72.7%	631	815	77.4%	840	697	83.0%
Water	1 260	1 314	95.9%	1 292	1 339	96.5%	1 192	1 144	96.0%

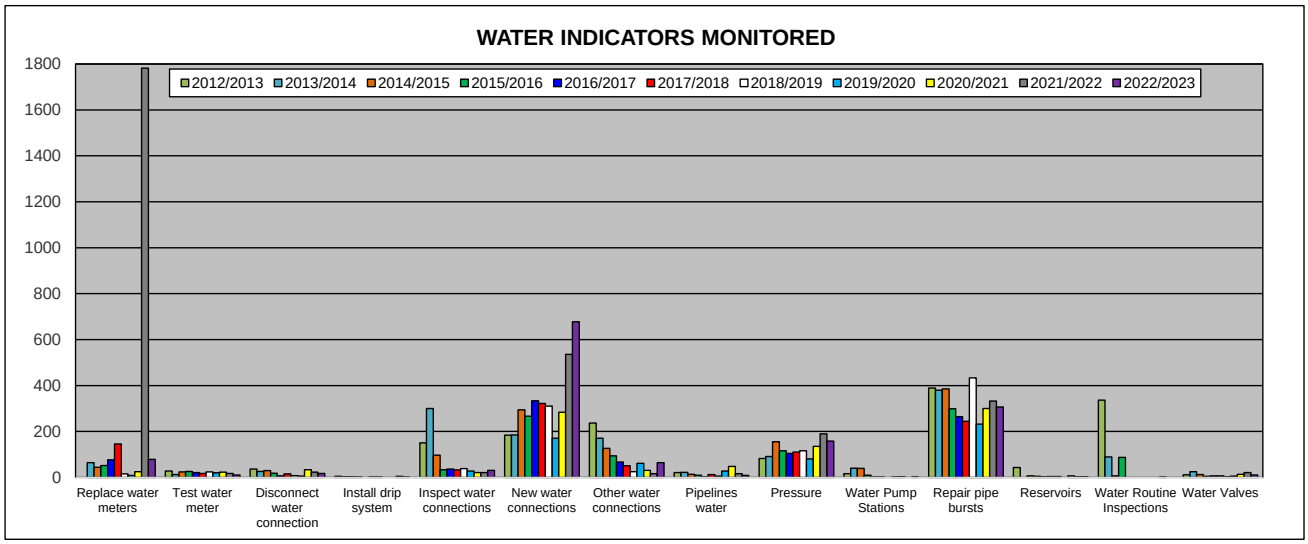


Figure C.9.2: Water Indicators Monitored by Overstrand Municipality

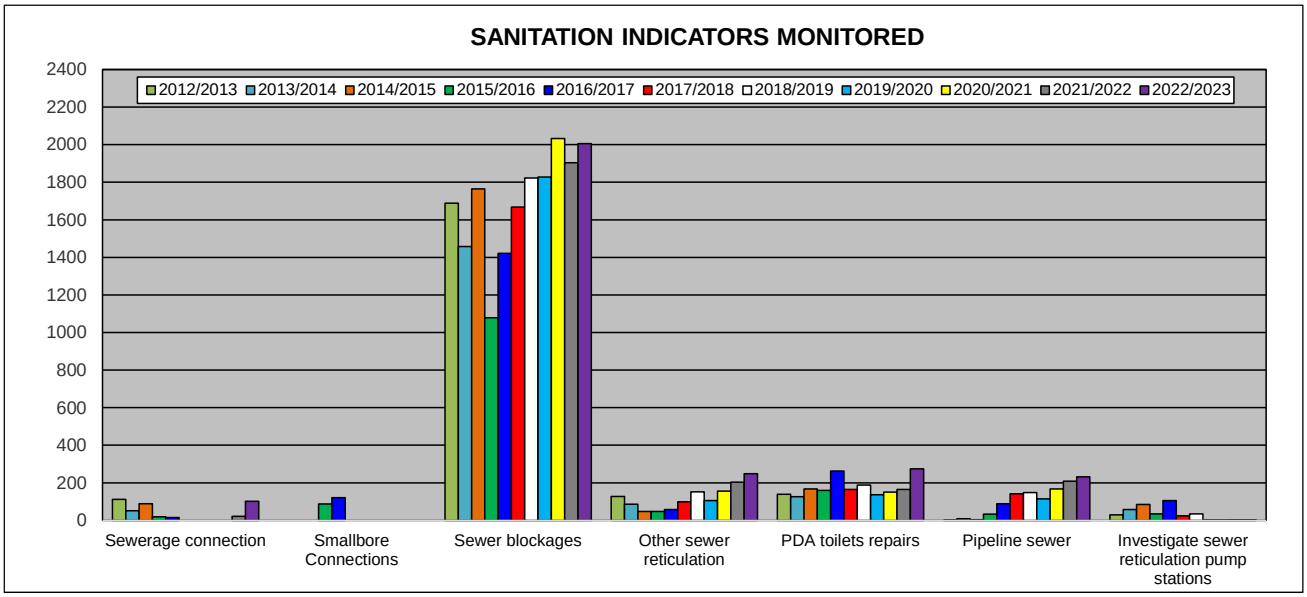


Figure C.9.3: Sanitation Indicators Monitored by Overstrand Municipality

The table below gives a summary of the water and sanitation records that are kept by Overstrand Municipality and the maintenance work that was carried out over the last five financial years for the various areas.

Table C.9.5: Water and Sanitation Indicators Monitored by Overstrand Municipality with regard to Customer Services and Maintenance Work

Service	Definition	Gansbaai					Hermanus					Kleinmond					Stanford					Overstrand Total				
		22/23	21/22	20/21	19/20	18/19	22/23	21/22	20/21	19/20	18/19	22/23	21/22	20/21	19/20	18/19	22/23	21/22	20/21	19/20	18/19	22/23	21/22	20/21	19/20	18/19
Sewerage connection	Provision of connection or inspection of existing connections	15	7	-	-	-	80	12	-	-	-	4	1	-	-	-	2	2	-	-	-	101	22	-	-	-
Smallbore Connections	Test new tanks smallbore	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sewer blockages	Repair blockages on main sewer pipelines up to connection points	130	79	83	73	73	1 515	1 481	1 638	1 472	1 427	294	291	244	218	245	67	53	67	65	78	2 006	1 904	2 032	1 828	1 823
Other sewer reticulation	Any other sewer reticulation inspections	9	1	2	13	23	239	199	152	85	114	-	3	1	3	4	-	1	1	5	11	248	204	156	106	152
PDA toilets repairs	Previously disadvantaged toilets repaired	161	128	94	85	145	79	16	52	51	36	33	20	1	-	6	1	1	4	1	1	274	165	151	137	188
Pipeline sewer	Installation of sewer pipelines or repair of pipelines	3	1	-	-	-	229	206	165	113	147	-	-	1	-	-	-	2	1	1	1	232	209	167	114	148
Investigate sewer reticulation pump stations	Work carried out at sewer pump stations	1	1	-	-	2	-	-	-	1	27	-	1	1	-	1	1	-	-	-	4	2	2	1	1	34
Replace water meters	Replace water meters	19	-	5	4	6	24	1 623	5	-	2	21	159	8	-	7	15	-	7	5	-	79	1 782	25	9	15
Test water meter	Testing of water meter for accuracy	2	2	3	4	2	8	11	18	16	20	1	3	2	-	2	-	1	-	-	-	11	17	23	20	24
Disconnect water connection	Disconnect supply	13	1	2	-	1	2	21	25	1	2	-	1	7	1	3	2	-	-	4	2	17	23	34	6	8
Install drip system	Installation and inspection of drip systems	-	2	-	-	1	-	-	-	-	-	1	-	-	-	-	-	3	-	-	-	1	5	-	-	1
Inspect water connections	Inspect connections	13	2	6	2	1	9	11	8	15	18	9	8	7	9	16	-	-	-	2	3	31	21	21	28	38
New water connections	New water connections	433	217	96	42	79	107	116	71	54	105	129	197	106	69	118	9	6	11	6	9	678	536	284	171	311
Other water connections	Inspections and work carried out at water connections	55	4	26	47	9	3	8	1	4	5	1	2	4	6	11	5	2	-	4	-	64	16	31	61	25
Pipelines water	Installation or repair of water pipelines	3	9	43	17	1	-	-	-	-	-	3	7	3	8	4	3	-	2	3	1	9	16	48	28	6
Pressure	Complaints with regard to pressure in the system	32	19	30	21	42	47	76	43	22	39	77	93	61	36	34	2	2	1	2	1	158	190	135	81	116
Water Pump Stations	Inspections and work carried out at water pump stations.	2	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	2	-	3	1	-
Repair pipe bursts	Repair of burst water pipelines	13	13	11	46	32	44	15	32	27	87	243	298	297	145	264	7	7	10	14	50	307	333	267	232	433
Reservoirs	Inspection of reservoirs and work carried out at reservoirs	-	-	1	-	1	-	-	2	-	-	2	2	4	-	3	-	-	-	-	-	2	2	7	-	4
Water Routine Inspections	Any water related inspections	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Water Valves	Inspection of valves and work carried out on valves	4	6	5	1	-	1	1	1	-	1	5	11	8	4	1	1	3	-	1	-	11	21	14	6	2

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

The Water Safety Plans of Overstrand Municipality includes an Improvement / Upgrade Plan. The purpose of the Improvement / Upgrade Plan is to address the existing significant risks where the existing controls were not effective or absent. Barriers implemented by Overstrand Municipality against contamination and deteriorating water quality include the following:

- Participate in Catchment management and water source protection initiatives.
- Protection at points of abstraction such as river intakes and dams (Abstraction Management).
- Correct operation and maintenance of WTWs (Coagulation, flocculation, sedimentation and filtration).
- Protection and maintenance of the distribution system. This includes ensuring an adequate disinfectant residual at all times, rapid response to pipe bursts and other leaks, regular cleaning of reservoirs, keeping all delivery points tidy and clean, etc.

Three other important barriers implemented by Overstrand Municipality against poor quality drinking water that are a prerequisite to those listed above are as follows:

- A well-informed Council and top management that understands the extreme importance of and are committed to providing adequate resources for continuous professional operation and maintenance of the water supply system.
- Competent managers and supervisors in the technical department who are responsible for water supply services and lead by example and are passionate about monitoring and safeguarding drinking water quality.
- Well informed community members and other consumers of water supply services that have respect for water as a precious resource.

D. APPROVAL AND PUBLICATION RECORD

This Annual WSDP Performance- and Water Services Audit Report is for the 2022/2023 Financial Year and is hereby approved for submission to the Minister of the Department of Water and Sanitation, the Minister for the Department of Cooperative Governance, the Western Cape Province, and to SALGA, as required by the Water Services Act, 1997. The Municipality will endeavour to publicise a summary of the report.

This report will be available for inspection at the offices of the municipality and is available on the Municipality's website.

RECOMMENDED:

Signature
Name: H Blignaut
Title: Deputy Director: Engineering Planning

09/10/2023
Date

Signature
Name: S Müller
Title: Director: Infrastructure and Planning

09/10/2023
Date

APPROVED:

Signature
Name: D O'Neill
Title: Municipal Manager

09 October 2023
Date

REFERENCES

- SA Census Data (2011), Community Profiles.
- Water Services Act, Act 108 of 1997. Regulations under Section 9 of the Water Services Act, which include the water services audit as Section 10 of the Guidelines for Compulsory National Standards.
- DWS's Annual Water Services Development Plan Performance- and Water Services Audit Report Template, August 2014.
- DWS's 2014 Blue Drop Report and 2022 Blue Drop PAT Results.
- DWS's 2022 Green Drop Report.
- DWS's All Towns Reconciliation Strategy Documents for each of the towns in Overstrand Municipality's Management Area, Version 2 June 2015.
- Overstrand Municipality's Municipal Services Strategic Assessment (MuSSA) Report, 2023, DWS.
- Overstrand Municipality's Water Services Audit Report for 2021/2022, Final Document, iX engineers
- Overstrand Municipality's Operational Budgets and Tariffs.
- Asset Register for Water and Sewerage Infrastructure Assets, June 2023.
- SDBIP of Overstrand Municipality for 2022/2023.
- WWTW Process Audit Reports, June 2022, EnviroMetsi, on behalf of Integral Laboratories.
- WTW Process Audit Reports, June 2022, EnviroMetsi, on behalf of Integral Laboratories.
- Augmentation of potable water supplies to Hermanus, Scoping Report, Overstrand Municipality, Aurecon Ref 113216.
- Augmentation of potable water supplies to Hermanus, Additional work undertaken into sea water desalination, Overstrand Municipality, Aurecon Ref 113216.

ATTENDANCE REGISTER (DISCUSSION OF DRAFT DOCUMENT)

iX engineers
Infrastructure Excellence

ATTENDANCE REGISTER

Meeting Subject	22/23 Water Services Audit Report – Discussion of Draft Document		
Location Of Meeting	Overstrand Municipality	**Document No**	
Chaired By	J Human	**Date of Meeting**	10 October 2023
Recorded By	iX engineers	**Time Start**	11:00
		Time Finish	12:30

Attended by:

Representative	Name of Firm	Postal Address	Contact Details				Signature
1. U. MKONTO	DWS	52 SPEERU M BUILDING VOORTREKKER	Tel No	0819416039	E-mail	mkonton@dws.gov.za	
			Cell No	0823709708	Fax No		
2. H. BLIGNAUT	OVERSTRAND MUN.	PO Box 20 HERMANUS 7200	Tel No	028 313 5047	E-mail	hblignaut@overstrand.gov.za	
			Cell No	082 497 9169	Fax No		
3. P. Robinson	Overstrand Mun	11	Tel No	028 313 5046	E-mail	probinson@overstrand.gov.za	
			Cell No	076 548 8256	Fax No		
4. J HUMAN	iX ENGINEERS	PO BOX 398 BELLVILLE	Tel No	021-9123000	E-mail	jaco.h@ixengineers.co.za	
			Cell No	0846318728	Fax No		

ANNEXURE A

(Refer to electronic version)

Number of Consumer Units per Category (Water)

Number of Consumer Units per Category (Sanitation)

IWA Water balances for the various distribution systems

WTW flows and capacities

WTW peak flows (December and January 2012 - 2023)

Rainfall and WWTWs flows and capacities

WWTW peak flows (December and January 2015 – 2023)

ANNEXURE B

(Refer to electronic version)

No Drop Spreadsheets and ILIs

ANNEXURE C

Future Water Requirement Projections for the various distribution systems

ANNEXURE D

Water Quality Compliance Sample Results for 2022/2023

Final Effluent Quality Compliance Sample Results for 2022/2023

ANNEXURE E

DWS’s scorecard for assessing the potential for WC/WDM efforts

ANNEXURE F

(Refer to electronic version)

Overstrand Municipality’s Organogram