DRAKENSTEIN MUNICIPALITY

DRAFT DRAKENSTEIN MUNICIPALITY WATER CONSERVATION AND WATER DEMAND MANAGEMENT STRATEGY

Notice is hereby given that Council intends to adopt a Water Conservation and Water Demand Management Strategy - Water Services Sector Input document. Documentation regarding the above-mentioned strategy is available at the following venues from 01 August 2018:-

- Paarl Library (Market Street)
- Drakenstein Library
- Mbekweni Library
- Van Wyksvlei Library
- Gouda Library
- Saron Library
- Wellington Library
- Paarl Civic Centre
- Municipal Offices (Market Street Building)
- Municipal Offices (Paarl East)
- Wellington Municipal Offices
- Gouda Municipal Offices

The draft strategy is also available on the municipal website, www.drakenstein.gov.za.

Any additional information regarding the process can be obtained by Mr S Nkonyane at (021- 807 6238) or sifiso.nkonyane@drakenstein.gov.za.

Written comments can be lodged to the City Manager, P O Box 1, Paarl, 7622 or records@drakenstein.gov.za, by no later than Monday, 03 September 2018. Comments that are received after the closing date may not be considered.

02 August 2018

DR J H LEIBBRANDT
CITY MANAGER

Paarl Post – 02/08/2018
Cape Times – 02/08/2018
DRAKENSTEIN MUNISIPALITEIT

KONSEP 2017/2018 WATERBEWARING EN WATERAANVRAAG BESTUURSTRATEGIE

Kennis geskied hiermee dat die Raad van voorneme is om die Konsep Waterbewaring en Wateraanvraag Bestuurstrategie - Watersektor Inset Verslag te aanvaar. Dokumente aangaande bogenoemde beleid is beskikbaar vanaf 01 Augustus 2018 by die volgende lokale:-

• Paarl Biblioteek (Markstraat)
• Drakenstein Biblioteek
• Mbekweni Biblioteek
• Van Wyksvei Biblioteek
• Gouda Biblioteek
• Saron Biblioteek
• Wellington Biblioteek
• Paarl Burgersentrum
• Munisipale Kantore (Markstraat Gebou)
• Munisipale Kantore (Paarl-Oos)
• Wellington Munisipale Kantore
• Gouda Munisipale Kantore


Enige addisionele inligting rakende die proses is beskikbaar by Mnr S Nkonyane at (021- 807 6238) of sifiso.nkonyane@drakenstein.gov.za.

Skriflike kommentaar kan gerig word aan die Stadsbestuurder, Posbus 1, Paarl, 7622 of records@drakenstein.gov.za, teen nie later nie as Maandag, 03 September 2018. Kommentare wat na die sluitingsdatum ontvang word mag moontlik nie oorweeg word nie.

02 Augustus 2018

DR J H LEIBBRANDT
STADSBESTUURDER
Paarl Post – 02/08/2018
Die Burger – 02/08/2018
UMASIPALA WASE DRAKENSTEIN

UYILO LOLONDOLOZO LWAMANZI WOMASIPALA WASE DRAKENSTEIN KUNYE NOBUCHULE BOKULAWULWA KWEMFUNEKO

Nasi isaziso sibhengezwa okokuba iBhunga liceba ukumilisela ukulondoloza amanzi kunye nobuchule bokulawula imfuneko -ncandelo lwenkonzo zamanzi. Amaxwebhu malunga nebubuchule bukhankanyiwelo apha ngentla ayafumaneka kwezindawo zingentla ukusukela ngomhla we 01 Ogasti 2018:-

• Paarl Library (Market Street)
• Drakenstein Library
• Mbekwene Library
• Van Wyksvlei Library
• Gouda Library
• Saron Library
• Wellington Library
• Paarl Civic Centre
• Municipal Offices (Market Street Building)
• Municipal Offices (Paarl East)
• Wellington Municipal Offices
• Gouda Municipal Offices

Uyilo lobuchule luyafumaneka kwi webhusayithi kamasipala [www.draekenstein.gov.za].

Inkukacha ezongeziwelo malunga nalenkwubo ziyafumaneka ku Mnu S Nkonyane at (021- 807 6238) okanye [sifiso.nkonyane@draekenstein.gov.za].

Izimvo ezibhalwelo zingangeniswa ku City Manager, P O Box 1, Paarl, 7622 okanye [records@draekenstein.gov.za] kungagqithanga [Mvulo, 03 Septemba 2018]. Izimvo ezingeniswe emveni komhla wokuvalwa aziyikuhowa.

02 Ogasti 2018

GQIRHA J H LEIBBRANDT
MANEJALA WESIXEKO

Dizindaba – 02/08/2018
DRAKENSTEIN MUNICIPALITY
WATER CONSERVATION
AND WATER DEMAND MANAGEMENT STRATEGY
Drakenstein Municipality purchases the bulk of its water from the City of Cape Town's (COCT) bulk supply system, but also has its own water source on Paarl Mountain, which can be supplemented by extractions from the Berg River. Water from the Mountain/Berg River scheme contributes to between 5 and 10% of the annual average daily demand (AADD). Water from the City of Cape Town's bulk water system is purified and stabilised at City of Cape Town's Wemmershoek water treatment plant, whereas the raw water from the Mountain/Berg River scheme is treated by Drakenstein Municipality at Meulwater water treatment works.

Water is distributed to the consumers in Drakenstein via a reticulation network consisting of 30 reservoirs with a total storage volume of 244 Mℓ, 15 pump stations and some 650 km of pressure pipelines with diameters varying between 40 mm and 1000 mm.

Between the years 1989 and 1999 Paarl experienced a yearly increase in AADD of some 3.5%. The total AADD of Paarl prior to the water demand management initiatives were in the order of 17.9 Mm3 per annum (about 49 Mℓ/ d). Although most of the consumers are residential, Paarl also has a large industrial component.

Pre 2000 Non-revenue water (NRW) was unacceptably high, consistently in excess of 30%. For the year ending January 1999 the NRW was as high as 34.7%.

The water demand management strategy, which was approved by Paarl council in 1997, is a structured and organised plan to combat the high water consumption and high levels of non-revenue water. The strategy entailed:

- Hydraulic modelling of and master plan for the water reticulation network
- A rising block tariff structure
- Increased public awareness
- Universal metering (metering of all unmetered connections)
- Promotion of water saving devices
- Pressure management

Drakenstein Municipality's main objective for the active implementation of a WDM Strategy is to delay the development of additional water sources, defer the upgrading of bulk infrastructure, reduce the high percentage of non-revenue water to acceptable standards, reduce the bad debt situation of the Municipality and increase the financial viability of the Municipality. This revised WC/WDM strategy seeks to overcome the challenges experienced in the old strategy, build on to the current strategy based on the experience gained over the past 15 years.
LIST OF ACRONYMNS

AADD  Annual Average Daily Demand
CCT   City of Cape Town
DWS   Department of Water and Sanitation
NRW   Non-Revenue Water
NWA   National Water Act
NWRS  National Water Resource Strategy
O & M Operation and Maintenance
UaW   Unaccounted for water
WC    Water Conservation
WDM   Water Demand Management
WSA   Water Services authorities
WSDP  Water Services Development Plans
WSI   Water Services institutions
WTW   Water Treatment Works

LIST OF UNITS

l/s    Litres per second
m3/s   Cubic metres per second
Mm3/a  Million cubic metres per annum
ML/day Mega litres per day
KL/month Kilolitres per month
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INTRODUCTION

The Drakenstein municipal area is situated some 60 km to the north of Cape Town in the Western Cape. It basically consists of areas surrounding the upper reaches of the Berg River and includes the towns of Paarl, Wellington, Hermon, Gouda and Saron. Of these towns, Paarl is by far the largest. Of the total population of about 287 044, some 157 875 resides in Paarl (about 55 %) with a total municipal water demand of about 15.03 Mm$^3$ per annum at the end of June 2017, Paarl consumed in access of 10.98 Mm$^3$ per annum.

Paarl experienced an average increase in water consumption of 3.5 % per annum over the years 1989 to 1999. Unaccounted for water (UaW) was unacceptably high, in excess of 34 %, and the need to conserve water and manage the demand became an urgent priority.

The historical water demand and supply of Wellington, Bainskloof, Hermon, Gouda and Saron is limited as these towns only became part of Drakenstein Municipality in 2000. Available data over the past 10 years, July 2007 to June 2017, indicate the following with regards to water demand and losses for the different towns:

- Wellington had a water demand of 3.2 Mm$^3$ per annum (21.5% of total demand) in June of 2017 with an average of 3.16% water losses over the ten year period.
- Bainskloof had a water demand of 0.0055Mm$^3$ per annum (0.04% of total demand) in June 2017 with an average of 21.29% water losses over the years 2009 to 2017.
- Hermon had a water demand of 0.037Mm$^3$ per annum (0.25% of total demand) in June 2017 with an average of -3.3% water losses over the ten years.
- Gouda had a water demand of 0.17Mm$^3$ per annum (1.2% of total demand) with an average 19.7% water losses over the ten years.
- Saron has a water demand of 0.59Mm$^3$ per annum (4% of total demand) in June 2017 with an average of 21.96% water losses over the ten years.
1. LEGISLATIVE REQUIREMENTS FOR WATER DEMAND MANAGEMENT AND WATER CONSERVATION

Legislation regarding water demand management and water conservation is found in the National Water and Water Service Acts, as well as in Drakenstein Municipality’s by laws and associated regulations. Below are the most important references from the National Water and Water Services Act.

The following clauses in the Water Service Act relate directly to WC/WDM:

- **Clause 2** (j) states that one of the main objectives of the Act is:
  "the promotion of effective water resource management and conservation"

- **Clause 4** (2) requires that one of the conditions set by the Water Services provider (c) “Must provide for-
  (vi) measures to promote water conservation and water demand management”

- **Clause 11** specifies the duty of water service authorities to provide access to Water Services.
  (1) "Every Water Services authority has a duty to all consumers or potential consumers in its area of jurisdiction to progressively ensure efficient, affordable, economical and sustainable access to Water Services."

2. DEFINITION OF WATER CONSERVATION (WC)

Conservation, in relation to a water resource, is defined in the Water Services Act as being the efficient use and saving of water, achieved through measures such as water saving devices, water-efficient processes, water conservation and demand management and water rationing.

The Water Conservation and Demand Management National Strategy Framework (DWA, 1999a) interprets water conservation as being the minimisation of loss or waste, the preservation, care and protection of water resources and the efficient and effective use of water.

3. DEFINITION OF WATER DEMAND MANAGEMENT (WDM)

"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." WDM is a strategy that leads to the development of systems and measures to manage water use, and thereby water demand. Drakenstein Municipality has developed a WDM Strategy in line with these principles, which is later outlined in this document.

4. STRATEGIC OBJECTIVES OF WATER DEMAND MANAGEMENT STRATEGY

In order to implement and sustain the initiatives and processes of the water demand management strategy, goals and strategic objectives have been set as. The table below summarises these goals and strategic objectives.

<table>
<thead>
<tr>
<th>No</th>
<th>Strategic Goal</th>
<th>Strategic Objective</th>
<th>Target Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>To reduce water losses as far as possible</td>
<td>To maintain the percentage of non-revenue water below 10% over the next five years by implementation of the water demand management initiatives.</td>
<td>Ongoing*</td>
</tr>
<tr>
<td>2</td>
<td>To ensure the security of Water supply for Drakenstein Municipality</td>
<td>To improve the security of water supply by creating +48 hours storage time at all supply systems</td>
<td>2025*</td>
</tr>
<tr>
<td>3</td>
<td>To operate and maintain the infrastructure effectively, efficiently and sustainably</td>
<td>To improve on the existing asset management system</td>
<td>Ongoing*</td>
</tr>
<tr>
<td>4</td>
<td>To automate, monitor and control infrastructure as efficient as possible</td>
<td>To expand on the existing automation, remote monitoring and control systems in the water reticulation network</td>
<td>2025*</td>
</tr>
</tbody>
</table>

*The goals and objectives summarised above can only be successfully met subject to the filling of all vacant critical posts in the Water Services Section and the sufficient funding of operations and maintenance programs and capital projects related to water demand management.

5. WATER DEMAND MANAGEMENT STRATEGY

Based on the fundamental principles of WC/WDM as well as the experience gained from the current WDM Strategy, Drakenstein Municipality has put in place ten water conservation/water demand management interventions and initiatives to combat the high water losses and reduce the high percentage of non-revenue water. These interventions and initiatives entail:

- Leak Detection
- Hydraulic modelling of and master planning for the water reticulation network
- Use of a rising block tariff structure
• Increased public awareness
• Universal metering (metering of all unmetered connections)
• Replacement of water meter with emphasis on 40mmØ and larger sizes.
• Promotion of water saving devices and high quality plumbing fittings
• Use of a Telemetry System and internet based systems to monitor and manage water reticulation system
• Refurbishment and replacement of existing water network
• Pressure Management
• Optimising of work processes
• Preventative Maintenance
• Implementation of pre-paid/smart water meters

5.1. Leak Detection

Leakage is usually the major cause of water loss in water-distribution systems. To minimize public health risk and to conserve water, Drakenstein Municipality continuously monitor their distribution systems and conduct leak-detection inspections. A Water Balance provide an overall view of water losses and identifies areas of the distribution system having excessive leakage. Leak-detection inspection determine the exact location of leaks by using acoustic listening devices and modern leak noise correlators including the continuous monitoring of minimum night flow.

5.2. Hydraulic Modelling Of and Master Planning

A network hydraulic model was used to identify areas with high pressure and to assist in sectoring the network into discrete pressure management zones. Real time data logging is used to monitor the zones and pick up any unauthorised zone valve operations and possible leakages which can compromise the pressure management and water conservation activities.

5.3. Use of a Rising Block Tariff Structure

A rising block tariff structure consisting of a six step tariff structure is used by Drakenstein Municipality. This is done to encourage residential consumers who consume vast quantities of water, mostly due to liberal and sometimes irresponsible garden irrigation, to change their water consumption patterns. The rising block tariff structure ensures that consumers who use water irresponsibly pay more for the water. The tariffs are structured to conserve water but are sufficiently conservative to allow even fairly liberal household consumption, with the highest rate only kicking
in at consumption in excess of 1000 kℓ/month. The municipality’s lowest block tariff is 6kℓ of free basic water.

5.4. Increased public awareness

Increasing public awareness is one of the most important initiatives for Water Demand/Conservation Management as the change of the way consumers use and perceive water has a significant impact on the failure or successes of Water Demand/Conservation Management Strategy. Successes can be achieved in a number of ways including but not limited to:

- Water-related reports and articles should be placed in the municipal newsletter, local and regional newspapers.
- Municipal accounts should include an information block, and sometimes flyers with additional information about water usage and statistical information about the capacity and levels of water in Drakenstein Municipality’s dams and reservoirs.
- Advertisements and interviews with officials, school pupils and teachers, as well as other initiatives are aired via the local radio station, especially during the annual water week campaigns.
- Exhibitions during Water week at different venues like the Mall, Libraries and Shopping Centres every year during national Water Week.
- Poster, singing competitions and puppet shows are held, at the local schools.
- Groups of school pupils are continuously taken on a tour of Meulwater WTW to teach them about the cycle of water and processes involved in purifying potable water.

5.5. Universal metering

As part of the water demand/conservation management, it is of utmost importance that all known water connections be metered using the same type and quality of water meters. These unmetered connections include:

- Metering of all irrigation connections including municipal parks.
and road medians.
- Metering of all industrial fire connections.
- Metering of all municipal communal toilets and stand pipes
- Metering of and administration of municipal sports fields.

In addition to conventional water meters, the implementation of “smart” water meters with prepaid functionality has additional benefits for the municipality which include guaranteed revenue collection, improved management and reporting of consumer water demand and the elimination of erratic meter readings.

5.6. Replacement of water meter with emphasis on 40mmØ and larger sizes metering

Similar to universal metering it is of utmost importance that all known large water connections are metered using the same type and quality of water meters. The meters, 40mmØ and larger, to these connection are replaced on a regular basis in order to reduce non-revenue water caused by inaccurate water meter reading and maximise income for the municipality.

5.7. Promotion of Water Saving Devices and High Quality Plumbing fittings

Promotion of water saving devices is key factor in water Demand/Conservation Management as most leaks occur beyond the meter at the private property level, schools, libraries, community halls and public clinics due to failing cisterns and substandard plumbing fittings. It is therefore important to promote water saving devices such as dual flush cisterns, water less urinals, flushmaster valves and water saving taps and shower heads including the use of high quality fittings. These promotions should be done throughout the year and during the public awareness campaigns.

5.8. Use Telemetry System

A Telemetry system is installed on most bulk meters, as well as on reservoirs and on dams, pump stations and WTWs. The telemetry systems are used to help assist with the monitoring, management and operation of the water reticulation system. It helps the water demand management team to track and identify underground leakages, identify malfunctioning meters and minimise water losses caused by overflowing reservoirs.

The maintenance of this tool must be done efficiently and managed by Operations Division.
5.9. Refurbishment and replacement of existing water network

Drakenstein municipality is continuously undertaking the refurbishing and replacement of infrastructure i.e. old asbestos/fibre cement and cast iron pipes, according to a prioritisation replacement plan in including the replacement of upgrading of infrastructure like water treatment plants and pump stations. All high risk pipelines and valves are replaced according to their risk rating as identified in the replacement plan/schedule. The preferred pipe system used is HDPE, which is used on all pipe cracking and open trench construction methods up to pipe sizes of 630mmØ.

5.10. Pressure Management

Water losses occur in a water network due to leaking fittings and the aging of pipes in the network caused by uncontrolled high pressures. The National Water Regulation stipulates that water network pressure should not exceed 900kPa (9 Bar). The aim is to optimally operate the system above the firefighting minimum of 240kPa (2.4 Bar). Drakenstein Municipality has various pressure reducing valves with electronic flow and pressure controllers that reduce high water losses in the water network and reduce the high non-revenue water percentage. This is achieved through:

- Modelling the network as part of the Municipality’s Water Master Plan to assess potential savings.
- Identifying high pressure zones.
- Controlling pressures during different times of the day, keeping lowest pressure at night when demand is lowest.
- Fine tuning of flow and pressure profiles at all pressure management installations.

5.11. Optimisation of work processes

A huge amount of water losses are attributed to various types of burst in a water reticulation system, theft and vandalism of water infrastructure such as air valves, bulk water meters chambers and PRV chambers etc. situated in both remote and urban areas. Reaction time to shutting off the water for repairs to be conducted is paramount thus making sure that the least amount of water is lost due to these incidents. Drakenstein Municipality strives to make sure to keep the reaction times to an absolute minimum maintaining an average reaction time of 15 to 30 minutes to shutting off the water once the incident has been reported. What’s key to maintaining such a low reaction time is the optimising of the work processes by always prioritising incidents related to water leakages on the water reticulation network.

5.11. Preventative Maintenance

Preventive maintenance is planned maintenance performed to a schedule with the aim of preventing the wear and tear or sudden failure of equipment and infrastructure. Preventive maintenance helps to:
- Protect infrastructure and prolong the useful life thereof
- Improve system reliability
- Decrease cost of replacement
- Decreases system downtime
- Reduce injury
- Reduce the high water losses

Drakenstein municipality conducts preventative maintenance on its critical water reticulation network infrastructure on an annual basis to achieve the abovementioned goals. Thant preventive maintenance include:

- Servicing of pumps and generators.
- Servicing and maintenance of water treatment works equipment.
- Servicing and maintenance control valves, PRVs and scour valves.
- Calibration and functionality verification of bulk water meters.
- Cleaning of Reservoirs.

6. TARGETS

6.1. Annual Water Demand

The annual water demand for Drakenstein Municipality has increased by an average rate of 1.36% per annum between July 2010 and June 2017. This is considered to be acceptable as it is significantly below the projected average growth water demand of approximately 2.5% per annum. The aim of this strategy is to maintain the average increase of the water demand below the projected growth of 2.5% per annum. The table below indicates the annual water demand for the different towns in Drakenstein Municipality.

<table>
<thead>
<tr>
<th>Town</th>
<th>System Input Volume (Ml/a)</th>
<th>Average Percentage Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12/13</td>
<td>13/14</td>
</tr>
<tr>
<td>Paarl and Wellington</td>
<td>16 813.232</td>
<td>17 105.516</td>
</tr>
<tr>
<td>Saron</td>
<td>556.050</td>
<td>567.976</td>
</tr>
<tr>
<td>Gouda</td>
<td>174.238</td>
<td>187.765</td>
</tr>
<tr>
<td>Hermon</td>
<td>37.316</td>
<td>35.304</td>
</tr>
<tr>
<td>Total</td>
<td>17 584.721</td>
<td>17 900.967</td>
</tr>
</tbody>
</table>

*The sharp increase in water demand for Gouda is a result of commissioning of 148 water meters at the Gouda low cost housing project.
6.2. Non – Revenue Water

The national limit for non-revenue water is set at 20% of annual water demand of a water reticulation network (supply system). The annual percentage of non-revenue for Drakenstein Municipality has been maintained far below this limit for the period July 2012 to June 2017. This is considered to be exceptional as it is significantly below the 20% national limit currently standing at 9.27%. The table below indicates the percentage for non-revenue water for the different towns in Drakenstein Municipality over the last 5 years.

<table>
<thead>
<tr>
<th>Town</th>
<th>Percentage Non-Revenue Water</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12/13</td>
</tr>
<tr>
<td>Paarl and Wellington</td>
<td>12.08%</td>
</tr>
<tr>
<td>Saron</td>
<td>10.87%</td>
</tr>
<tr>
<td>Gouda</td>
<td>19.98%</td>
</tr>
<tr>
<td>Hermon</td>
<td>5.24%</td>
</tr>
<tr>
<td>Bainskloof</td>
<td>17.41%</td>
</tr>
<tr>
<td>Total</td>
<td>12.11%</td>
</tr>
</tbody>
</table>

*The negative percentage in Non-Revenue Water for Hermon is a result of the Inconsistent billed water accounts compared to the bulk metered water supplied to the system.

6.3. INFRASTRUCTURE LEAKAGE INDEX

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit</th>
<th>16/17</th>
<th>Record: Prior (ML/a)</th>
<th>15/16</th>
<th>14/15</th>
<th>13/14</th>
<th>12/13</th>
<th>11/12</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15/16</td>
<td>14/15</td>
<td>13/14</td>
<td>12/13</td>
<td>11/12</td>
</tr>
<tr>
<td><strong>Paarl and Wellington</strong></td>
<td>Volume</td>
<td>1,273.997</td>
<td>2</td>
<td>783.251</td>
<td>2,395.48</td>
<td>2</td>
<td>2,031.43</td>
<td>1,839.764</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>8.96%</td>
<td>13.33%</td>
<td>15.12%</td>
<td>14.00%</td>
<td>12.00%</td>
<td>11.05%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ILI</td>
<td>1.31</td>
<td>2.39</td>
<td>2.14</td>
<td>2.17</td>
<td>Paarl 2.39</td>
<td><em><strong>Wel 1.14</strong></em></td>
<td></td>
</tr>
<tr>
<td><strong>Saron</strong></td>
<td>Volume</td>
<td>115.128</td>
<td>56.247</td>
<td>95.455</td>
<td>183.080</td>
<td>60.456</td>
<td>63.060</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>19.39%</td>
<td>8.83%</td>
<td>15.83%</td>
<td>32.23%</td>
<td>10.87%</td>
<td>10.72%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ILI</td>
<td>3.49</td>
<td>1.85</td>
<td>2.91</td>
<td>5.63</td>
<td>1.87</td>
<td>1.97</td>
<td></td>
</tr>
<tr>
<td><strong>Gouda</strong></td>
<td>Volume</td>
<td>28.293</td>
<td>47.444</td>
<td>60.952</td>
<td>60.212</td>
<td>34.809</td>
<td>30.885</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>16.24%</td>
<td>23.18%</td>
<td>27.16%</td>
<td>32.07%</td>
<td>19.98%</td>
<td>19.95%</td>
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<td></td>
<td>ILI</td>
<td>1.87</td>
<td>3.19</td>
<td>4.58</td>
<td>4.59</td>
<td>2.62</td>
<td>2.50</td>
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<tr>
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<td>Percentage</td>
<td>-71.58%</td>
<td>-62.07%</td>
<td>-54.24%</td>
<td>-48.64%</td>
<td>5.24%</td>
<td>35.20%</td>
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<tr>
<td></td>
<td>ILI</td>
<td>-</td>
<td>-</td>
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<td>-</td>
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<td>3.72</td>
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<tr>
<td><strong>Bainskloof</strong></td>
<td>Volume</td>
<td>2.537</td>
<td>0.104</td>
<td>1.397</td>
<td>1.646</td>
<td>0.671</td>
<td>1.649</td>
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<tr>
<td></td>
<td>Percentage</td>
<td>46.43%</td>
<td>2.34%</td>
<td>28.76%</td>
<td>37.36%</td>
<td>17.41%</td>
<td>40.65%</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td>Volume</td>
<td>1,393.528</td>
<td>5.246</td>
<td>9.19477</td>
<td>2,623.24</td>
<td>2,129.33</td>
<td>1,952.24</td>
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</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>9.27%</td>
<td>13.11%</td>
<td>15.14%</td>
<td>14.65%</td>
<td>12.11%</td>
<td>11.19%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ILI</td>
<td>1.32</td>
<td>2.19</td>
<td>2.60</td>
<td>2.34</td>
<td>2.11</td>
<td>1.98</td>
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</tr>
</tbody>
</table>

*Note: 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

### 7. SUCCESSES TO DATE

Drakenstein Municipality has been very successful with its water demand and conservation efforts. These successes are summarized below:

- Drakenstein Municipality has maintained an average non-revenue water percentage blow 20% for the past 10 years.
- Drakenstein Municipality has been featured in various Civil Engineering magazines like IMESA for the outstanding Water Demand Management success over the years.
- In 2008, SALGA together with the Department of Water and Sanitation awarded Drakenstein Municipality with a certificate of recognition of excellent water conservation practices.

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Drakenstein Municipality Water Conservation and Water Demand Management Strategy
• In 2010 the municipality was awarded the Silver award, and in 2013 the Gold award for Water Demand Management Success by Impumelelo Social Innovation Centre for the exceptional water demand and conservation efforts.
• The Department of Water and Sanitation awarded Drakenstein Municipality 2nd place in the national Water Demand and Conservation Management Sector awards in 2013.

8. CHALLENGES
The most significant challenges hampering the proper implementation and expansion of the strategy are

• The ability to secure sufficient resources (operational and capital funding)) for the maintenance and expansion of the current W/CDM interventions.
• Shortage of qualified and experienced Technical personal and the retention thereof
• Vandalism and theft of old and new infrastructure.

9. STRATEGY EVALUATION AND REVIEW

• The overall strategy will be evaluated for effectiveness at intervals of five (5) years.
• The evaluations will be done on the basis of the recorded achievements in the saving of water through various initiatives and in obtaining water efficiencies within the Drakenstein Municipal operations.
• The evaluations will be done by the Water Services Branch, in consultation with each of the responsible entities in the Technical Support, Demand and Loss Control division involved.
• The outcome of the evaluation will be presented to the Executive Manager: Infrastructure Services

The evaluation will make recommendations to:

a) retain a particular strategy measure unaltered;

b) amend a particular strategy measure (giving the amendments proposed);

c) or, discard a particular strategy measure in its entirety.