

# KNYSNA MUNICIPALITY

## WATER CONSERVATION AND WATER DEMAND MANAGEMENT STRATEGY

AUGUST 2013



**KNYSNA**  
Municipality  
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## 1. INTRODUCTION

The Knysna Municipality, as the responsible Water Service Authority (WSA), provides safe potable water to the Greater Knysna area, which area includes Knysna, Brenton, Belvidere, Sedgefield, Rheenendal, Buffels Bay, and Karatara.

The Knysna Municipality, as the responsible WSA, has drawn up this Water Conservation and Water Demand Management Strategy (WC/WDM Strategy), as part of the Water Services Development Plan (WSDP) and hence the Integrated Development Plan (IDP).

Knysna's raw water supply schemes are particularly sensitive to variations in rainfall because the main water supply schemes rely on river abstraction. Without any significant storage dams on local rivers, Knysna has limited capacity to withstand droughts, or to overcome major pumping infrastructure problems.

Therefore, a sound Water Conservation and Water Demand Management (WC/WDM) strategy is one of the important parts of the Water Service Development Plan which guides us to use and protect our resources so that water is used efficiently and effectively.

## 2. LEGISLATIVE REQUIREMENTS FOR WC/WDM

Legislation regarding WC/WDM is found in the National Water and Water Service Acts, as well as in their associated regulations. (Recent announcements by the Minister of Water Affairs indicate that these two acts may be combined in unified new water legislation in the near future). The following most important references are listed below, and an expanded list is provided in Appendix B.

### 2.2 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.”

It specifies that this duty is subject to:

(2) (e) “the duty to conserve Water Resources”

- **Clause 13** specifies the contents of a draft Water Services development plan. Clause (j) specifies the following:
  - (j) “of existing and proposed water conservation, recycling and environmental protection measures”

### **3. DEFINITION OF WATER CONSERVATION (WC)**

***“The minimisation of loss or waste, care and protection of Water Resources and the efficient and effective use of water.”***

Knysna adopts the concept that WC is the overall care and protection of Water Resources. Further, that WC be adopted as a strategy in line with Knysna’s water resources profile and water supply constraints.

### **4. 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. Knysna has developed a WDM Plan in line with this strategy, which is outlined later in this document.

### **5. INTEGRATED WATER RESOURCE PLANNING (IWRP)**

The definition for “Integrated Water Resource Planning” is:

***“A method of analysing the change in demand and operation of water institutions that evaluates a variety of supply-side and demand-side management measures to determine the optimal way of providing Water Services.”***

Integrated Water Resource Planning (IWRP), or integrated least-cost planning, has been applied by Knysna to make planning decisions on providing water for the greater Knysna area. This involves taking all sources of water and all water resources into account, including the value of water saved and re-used, which all contribute to meeting the water requirements for the planned period.

### **6. VISION FOR WATER SERVICES (WC/WDM ROLE)**

The City of Cape Town’s Long Term Water Conservation and Water Demand Management Strategy links their vision statement to WC/WDM as follows, and is adopted by Knysna :

- **Equitable:** The block-rate tariff system ensures that consumers who use a lot more water pay a tariff related to the marginal cost of water. This promotes equity since consumers who use more than their equal share of existing water resources should be made liable for new bulk infrastructure and water resources.
- **People-centered:** The WC/WDM paradigm places an emphasis on the consumers, the environment and their needs. Traditionally the supply side management paradigm focused mainly on engineering solutions to address perceived needs.
- **Affordable:** The implementation of WC/WDM can result in the postponement of capital projects that will result in long term financial savings and therefore restrain future increases in water prices. The reduction of non-revenue demand will also increase the efficiency of water supply and therefore make water more affordable. A number of WC/WDM initiatives will also directly reduce and retrofitting of plumbing fittings.
- **Sustainable:** The current limited water resources threaten the sustainability of water services in Knysna. WC/WDM can extend the assurance of supply of existing water resources and go a long way in reconciling future demand and supply.
- **Service to all:** WC/WDM can greatly increase the ability to supply water services to all by reallocating existing bulk capacity and water resources from inefficiency use to consumer, and ensuring that new water supply projects are sustainable.

## 7. WC/WDM PLAN

The Knysna Water Conservation and Demand Management Plan forms part of the Water Services Development Plan, where more detail is provided on the overall water situation and management thereof, including water and sanitation projects and budget.

The objectives of the plan are:

- To consolidate all existing information and data related to WCWDM in Knysna,
- Check the accuracy of the data and information,
- Identify critical WCWDM issues,
- Recommend interventions to address the critical issues,
- Ensure that all initiatives are coordinated and coherent in their implementation, AND
- Provide a clear basis to set WCWDM targets, monitor progress and optimise management of the WCWDM Plan.

Our water conservation plan includes the following initiatives:

- Tariffs, metering and credit control
- Water restrictions
- Leakage repair
- Pressure management

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- Consumer education
- Introduction of water efficient fittings
- Elimination of automatic flushing urinals
- Promotion of grey-water use
- Promotion of rainwater tanks

These initiatives and the results to date are expanded on in Appendix A.

## **8. REFERENCES**

Water Service Act, 1997 (Act 108 of 1997)

National Water Act, 1998 (Act 36 of 1998)

Water Conservation and Water Demand Management Strategy for the Water Service Sector  
<http://www.info.gov.za/view/DownloadFileAction?id=70350>

The City of Cape Town Long –Term Conservation and Water Demand Management Strategy; April 2007; Consultants: Georgios Constantinides (Constantinides, 2007)

Knysna Water Demand Review, Knysna Municipality WSDP 2009\_2010 (SSI, 2010)

## **9. APPENDIXES**

## APPENDIX A: WATER DEMAND MANAGEMENT PLAN

Our water conservation plan includes the following initiatives:

- Tariffs, metering and credit control
- Water restrictions
- Leakage repair
- Pressure management
- Consumer education
- Introduction of water efficient fittings
- Elimination of automatic flushing urinals
- Promotion of grey-water use
- Promotion of rainwater tanks

This annexure summarises the various aspects of the Knysna Water Conservation and Demand Management Plan, and forms part of the Water Services Development Plan, where more detail is provided on the overall water situation and management thereof, including water and sanitation projects and budgets.

### A1. Tariffs, Metering and Credit Control

Our target is to reduce the losses from the system and unaccounted for water to less than 10%.

From available treasury records of sales and production records the unaccounted water has been estimated as shown in Table 2.2.2.

<b>Table 8.1: Knysna Municipality_Unaccounted for water (2010-2013)</b>			
<b>KNYSNA MUNICIPALITY - UNACCOUNTED FOR WATER</b>			
	<b>2010/2011</b>	<b>2011/2012</b>	<b>2012/2013</b>
<b>KNYSNA</b>			
Raw Water Received (KL)	3 027 130	3 221 275	3 565 203
Purified Water Produced (KL)	3 104 301	3 189 062	3 455 717
Water Produced at RO Plant & Bigai Eye	-	50 445	51 219
Water Consumed (Finance Figures) (KL)	1 622 577	1 665 751	1 668 660
Unmetered Water (Prepaid & Standpipes)	797 100	1 074 121	1 265 805
Hornlee Prepaid Area water consumption	31 860	31 860	31 860
Water from WTW to Belvidere/Brenton	131 972	146 612	131 053
Water Lost (KL)	520 792	321 163	409 558
% Water Lost	16.8%	10.1%	11.9%

<b>Table 8.1: Knysna Municipality_Unaccounted for water (2010-2013)</b>			
<b>KNYSNA MUNICIPALITY - UNACCOUNTED FOR WATER</b>			
	<b>2010/2011</b>	<b>2011/2012</b>	<b>2012/2013</b>
<b>SEDGEFIELD</b>			
Raw Water Received (KL)	430 891	707 550	635 841
Water Produced at Desal Plant & B'Holes	-	593 446	589 555
Purified Water Produced (KL)	533 519	13 036	65 025
Water Consumed (Finance Figures) (KL)	413 350	448 150	444 958
Unmetered Water	0	0	0
Water Lost (KL)	120 169	158 332	209 622
% Water Lost	22.5%	26.7%	35.6%
<b>BRENTON</b>			
Raw Water Received (KL)	-	-	-
Purified Water Produced (KL)	130 507	144 567	138 770
Water Consumed (Finance Figures) (KL)	72 654	77 713	79 615
Unmetered Water	0	0	0
Water Lost (KL)	57 853	66 854	59 155
% Water Lost	44.3%	46.2%	42.6%
<b>BELVIDERE</b>			
Raw Water Received (KL)	-	-	-
Purified Water Produced (KL)	69 131	73 257	81 148
Water Consumed (Finance Figures) (KL)	63 220	66 638	77 786
Unmetered Water	0	0	0
Water Lost (KL)	5 911	6 619	3 362
% Water Lost	8.6%	9.0%	4.1%
<b>RHEENENDAL</b>			
Raw Water Received (KL)	-	-	-
Purified Water Produced (KL)	71 835	71 563	94 538
Water Consumed (Finance Figures) (KL)	49 884	7 268	13 948
Unmetered Water	36 180	36 180	36 180
Water Lost (KL)	-14 229	28 115	44 410
% Water Lost	-19.8%	39.3%	47.0%
<b>BUFFALO BAY</b>			
Raw Water Received (KL)	41 331	53 215	40 239
Purified Water Produced (KL)	40 470	51 113	43 498
Water Consumed (Finance Figures) (KL)	25 174	25 344	25 539
Unmetered Water	0	0	0

<b>Table 8.1: Knysna Municipality_ Unaccounted for water (2010-2013)</b>			
<b>KNYSNA MUNICIPALITY - UNACCOUNTED FOR WATER</b>			
	<b>2010/2011</b>	<b>2011/2012</b>	<b>2012/2013</b>
Water Lost (KL)	15 296	25 769	17 959
% Water Lost	37.8%	50.4%	41.3%
<b>KARATARA</b>			
Raw Water Received (KL)	56 422	58 697	59 108
Purified Water Produced (KL)	50 773	53 510	57 310
Water Consumed (Finance Figures) (KL)	42 885	48 452	53 035
Unmetered Water	11 445	11 307	10 312
Water Lost (KL)	-3 557	-6 249	-6 037
% Water Lost	-7.0%	-11.7%	-10.5%
			15.4%
<b>GREATER KNYSNA AREA</b>			
Raw Water Received (KL)	-	-	-
Purified Water Produced (KL)	3 868 564	4 080 351	4 380 702
Water Consumed (Finance Figures) (KL)	2 289 744	2 339 316	2 363 541
Unmetered Water	844 725	1 121 608	1 312 297
Hornlee Prepaid Area water consumption	31 860	31 860	31 860
Water Lost (KL)	702 235	587 567	673 004
% Water Lost	18.2%	14.4%	15.4%

The proper functioning of all water meters is regularly monitored. An ongoing meter replacement programme has been implemented. Meters replaced over the past two years are as follows:

Meters have been fitted to all water supply points at public amenities such as parks and beaches. Water consumption at these points is monitored.

Pre-paid water meters have been installed in the low-income areas.

Knysna Municipality has, for many years, applied a sliding scale of tariffs for water consumption in excess of the basic free water allowance. In addition to the consumption charges an annual availability charge is payable by most consumers.

<b>Table 8.2: Water Conservation / Water demand strategy</b>							
<b>WSA functions / outputs</b>	<b>In place? (Yes/ No/ n/a)</b>	<b>Resources available to perform function? (Yes/ No/ n/a)</b>				<b>If no, when will it be in place?</b>	<b>Support required (yes/no)</b>
		<b>Budget</b>	<b>Bylaws</b>	<b>Infra-structure</b>	<b>Personnel</b>		
<b>Policy development</b>							

<b>Table 8.2: Water Conservation / Water demand strategy</b>							
<b>WSA functions / outputs</b>	<b>In place? (Yes/ No/ n/a)</b>	<b>Resources available to perform function? (Yes/ No/ n/a)</b>				<b>If no, when will it be in place?</b>	<b>Support required (yes/no)</b>
		<b>Budget</b>	<b>Bylaws</b>	<b>Infra- structure</b>	<b>Personnel</b>		
Indigent Policy	Yes	Yes	Yes	Yes	Yes		
Free basic water policy (including equitable share)	Yes	Yes	Yes	Yes	Yes		
Free basic sanitation policy	Yes	Yes	Yes	Yes	Yes		
Procurement policy	Yes	Yes	Yes	Yes	Yes		
Credit control & debt collection policy	Yes	Yes	Yes	Yes	Yes		
<b>Regulation and tariffs</b>							
Water Services bylaws with conditions as required by the Water Services Act	Yes	Yes	Yes	Yes	Yes		
Mechanisms to ensure compliance with bylaws	Yes	Yes	Yes	Yes	Yes		
Tariff structure	Yes	Yes	Yes	Yes	Yes		
Tariffs promulgated	Yes	Yes	Yes	Yes	Yes		
<b>Infrastructure development (projects)</b>							
Mechanisms to undertake project feasibility studies	Yes	Yes	Yes	Yes	Yes		
Criteria for prioritising projects	Yes	Yes	Yes	Yes	Yes		
Mechanisms to assess and approve project business plans	Yes	Yes	Yes	Yes	Yes		
Mechanisms for selecting, contracting, managing and monitoring implementing agents	Yes	Yes	Yes	Yes	Yes		
Mechanisms to monitor project implementation	Yes	Yes	Yes	Yes	Yes		
<b>Water conservation and demand management</b>							
Water conservation and demand management strategy	Yes		Yes	Yes	No		Yes
<b>Performance management and monitoring</b>							
Performance management systems	Yes	Yes	Yes	Yes	Yes		
Water service monitoring and evaluation (M&E) system	No	No	Yes	Yes	No		Yes
<b>WSDP</b>							
WSDP information system	Yes	Yes	Yes	Yes	Yes		
Mechanisms for stakeholder participation	Yes	Yes	Yes	Yes	Yes		
Mechanisms to monitor and report on WSDP implementation	Yes	Yes	Yes	Yes	Yes		
<b>WSP institutional arrangements</b>							

Table 8.2: Water Conservation / Water demand strategy							
WSA functions / outputs	In place? (Yes/ No/ n/a)	Resources available to perform function? (Yes/ No/ n/a)				If no, when will it be in place?	Support required (yes/no)
		Budget	Bylaws	Infra- structure	Personnel		
Criteria to select appropriate WSPs	n/a	n/a	n/a	n/a	n/a		
Mechanisms to contract, manage and monitor WSPs	n/a	n/a	n/a	n/a	n/a		
Mechanisms to approve WSP business plans	n/a	n/a	n/a	n/a	n/a		
<b>WSA overall capacity</b>							
Sufficient staff and systems to fulfil all WSA functions	No	No	n/a	Yes	No		Yes
Other (state)							

## A2. Water Restrictions

During the past few years the annual rainfall has been variable. The water level in the Akkerkloof Dam, which is the main supply for the town of Knysna, has dropped significantly. The Karatara River, which is the main water supply for the town of Sedgefield, recently stopped flowing and the Municipality was forced to implement stringent water restrictions with a complete ban on garden watering and the use of hosepipes.

Limited water restrictions have also been applicable at other times.

During periods of water restrictions a number of residents consumer who failed to comply with the restrictions were fined.

The total water use in the Knysna WSA area was 3 869 MI in 2010/2011, and 4 080 MI in 2011/2012 according to readings and records provided by the Municipality. This reflects an increase of 5.4% when compared to the previous year. This can be attributed mainly to water restrictions being eased, as the area resources situation improved.

The water restrictions that were introduced due to the drought over the past years (2002-2005) may have both negative and positive consequences on a long term WC/WDM strategy. It is important to recognise the linkages and consequences between the water restrictions and WC/WDM in order to maximise any benefits that may be derived and minimise any negative impact.

## A3. Leak Repairs

The Municipality has a policy of attending to all leaks within six hours of them being reported.

There is monthly reporting from the Municipality's Treasury Department with regard to faulty or inaccurate metering. All suspected non-functioning water meters are investigated and if necessary replaced within 30 days of being reported.

Table 10.1: Complaints for water							
Description	2012/2013	Record: Prior					
		11/12	10/11	09/10	08/09	07/08	06/07
Total number of consumer units	11 769	Unknown	Unknown	11 126	-	10 730	10 405
No. Complaints of quality of service per year divided by total number of consumer units	5.5%	Unknown	Unknown	7.4%	-	6.1%	5.8%
Number of queries received within the year	649	Unknown	Unknown	831	-	656	611
% Queries responded to within 24 hours	100%	Unknown	Unknown	100%	-	100%	100%
Number of major or visible leaks reported within the year	208	Unknown	Unknown	0	-	0	0
% Major or visible leaks repaired within 48 hours after being reported.	100%	Unknown	Unknown	100%	-	100%	100%

Table 10.2: Complaints for sewer							
Discharge to treatment works	2012/2013	Record: Prior					
		11/12	10/11	09/10	08/09	07/08	06/07
Number of queries/ complaints received within the year	361	Unk	Unk	775	Unk	669	607
% Queries responded to within 24 hours	100	Unk	Unk	100	Unk	100	100
Number of blockages reported within the year	311	Unk	Unk	-	Unk	-	-
% Blockages repaired within 48 hours after being reported	100	Unk	Unk	100	Unk	100	100
No. Complaints per year divided by total number of consumer units	2.6%	Unk	Unk	6.9%	Unk	6.2%	-
<b>Pit/tank pumping</b>							
Number of pits/ tanks	Data not available.						
Number of calls received within the year for emptying	Data not available.						
Number of calls received within the year for emergency maintenance to pits/ tanks	Data not available.						

#### A4. Reduction of High Pressure

The Municipality has purchased a number of data loggers, which are being used to monitor water pressures in certain areas.

The Municipality has focussed on eliminating high pressure zones in the town, rather than installing pressure reducing valves, which have proven unreliable in the past.

Although Knysna has undulating landscape, the height variations are not excessive; therefore excess pressures are not a problem.

No statistics are readily available on the number of consumers in the various pressure zones

#### A5. Consumer Education

The Knysna Municipality has for a number of years had an ongoing public information and education programme to promote effective and efficient use of water. These include the following:

- Regular publication of tips for the conservation of water in the local newspapers.

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- Visits by schools to the Water Treatment Works. The treatment process and water conservation issues are explained to the learners.
- During peak holiday season large banners have been placed at strategic public places reminding residents and visitors to use water sparingly.

All Schools and Tertiary Education Facilities in Knysna are provided with adequate water and sanitation services.

Associated Services Facilities	Number of facilities	Role regarding services and specific water services	Adequate service (Yes/No)	Impact on water service
Schools	18	Normal	Yes	Normal

Activity	Resources available to perform function (Yes/No/N/A)			
	Budgets	Bylaws	Infrastructure	Personnel
Targets for reducing unaccounted for water and water inefficiencies (MI/year: urban)	Yes	Yes	Yes	Yes
Targets for reducing unaccounted for water and water inefficiencies (MI/year: rural)	Yes	Yes	Yes	Yes
Reducing high pressure for residential consumers: urban	n/a	n/a	n/a	n/a
Reducing high pressure for residential consumers: rural	n/a	n/a	n/a	n/a
Consumer/end-use demand management: public information and education programmes	Yes	Yes	Yes	Yes
Leak and meter repair programmes: urban	Yes	Yes	Yes	Yes
Leak and meter repair programmes: rural	No	No	No	No
Working for water programmes	No	Yes	No	No
Conjunctive use of surface and groundwater	Yes	No	Yes	Yes

There are a number of ways of ensuring the reduction of water demand by consumers. These can generally be divided into two categories. The first is to influence the behaviour of consumers and the second is through a implementation of assistance project.

Assistance projects are interventions of best management practises, which are funded or partially funded by WSAs. Examples include projects to repair plumbing leaks, to retrofit dual-flush toilets, installation of dual water distribution systems and to replace exotic gardens with alternative water wise gardens.

More efficient use can also be made through recycling of water. This can be to different standards depending on what it will be used for.

Basic services must include an education component. Many water and sanitation projects carried out by Municipalities have lacked this important aspect in the past and this need to be addressed.

Education programmes could include information on:

- Sanitation promotion.
- Source of water pollution (e.g. sewage with specific reference to downstream users of rivers and groundwater sources).
- Dangers of people using water from polluted rivers, boreholes or wells.
- Waterborne diseases.
- Health and hygiene awareness including initiatives to reduce waterborne disease, such as hand washing.
- The need to conserve water and use it efficiently.

There are a number of different methods in which these messages can be distributed and thought should be given to which groups will be targeted, possible health messages, communication methods, roles of different institutions, timeframes, who will carry it out and how skills will be transferred.

The methods include:

- Public meetings
- Printing information disseminated
- Radio/newspaper slots
- Household visits by health officials
- Number of Community Health Workers appointed
- Number of Households visit by health officials

A number of consumers had been targeted by Knysna Municipality for awareness and education is not defined. All settlements are however targeted for education, once basic services have been installed. One of the key elements of a sustainable WC/WDM strategy is to develop and promote activities that are also beneficial to consumers. WSA's are encouraged to adopt a win-win approach and not introduce punitive measures unless they have to. One of the most effective ways to encourage consumers to use water more efficiently is through tariff mechanism.

#### **A6. Introduction of Water Efficient Fittings**

Developers are required to install water efficient fittings in all new housing developments in the greater Knysna area.

#### **A7. Elimination of Automatic Flushing Urinals**

Good progress has been made with the elimination of automatic flushing urinals in municipal facilities. For this initiative to be extended to privately owned facilities an amendment to the byelaws will be required.

#### **A8. Promotion of Grey-Water Use**

There is no or little use of grey water at present. Individual use would be encouraged and monitored.

**A9. Promotion of Rainwater Tanks**

New developments are required to install rainwater tanks.

**A10. Conclusion**

The Knysna Municipality makes an ongoing and considerable effort to encourage water savings by consumers. We have also taken steps to reduce wastage of water from the distribution network.

Although there is still room for improvement the results reveal that a reasonable control of water losses is in place and the losses are within reasonable limits.

The Knysna Municipality will continue to pursue water conservation actions into the future to make the most efficient and effective use of the available water, to meet the demands of the expanding town and economic developments.

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## APPENDIX B: RELEVANT WATER LEGISLATION FOR WC/WDM

The following legislation regarding WC/WDM is found in the National Water and Water Service Acts, as well as in their associated regulations. (Recent announcements by the Minister of Water Affairs indicate that these two acts may be combined in unified new water legislation in the near future)

### B1. National Water Act

The following are selected clauses from the National Water Act that refer to WC/WDM:

- **Clause 8** makes water conservation one of the requirements of a catchment management strategy.

“(1) A catchment management agency contemplated in Chapter 7 must, by notice in the Gazette, established a catchment management strategy for the protection, use, development, conservation management and control of Water Resources within its water management area.”

- **Clause 29** makes water conservation one of the conditions associated with authorization of licenses.

“(1) A responsible authority may attach conditions to every general authorization or license –

(a) relating to the protection of –

- i. the water resources in question;
- ii. the stream flow regime; and
- iii. other existing and potential water users;

(b) relating to water management by –

- iv. specifying management practices and general requirements for any water use, including water conservation measures;”

- **Clause 56** specifies that the cost of water conservation can be included in the pricing strategy,

“(1) The Minister may, with the concurrence of the Ministry of Finance, from time to time by notice in the Gazette, establish a pricing strategy for charges any water use within the framework of existing relevant government policy.

(2) The pricing strategy may contain a strategy for setting water use charges –

(a) for funding water resource management, including the related costs of –

(iv) water resources protection, including the discharges of waste and the protection of the Reserve; and

(v) water conservation;”

- **Schedule 3 Clause 6** specifies that the catchment management agency may require users to undertake water conservation measures.

“(1) If a catchment management agency on reasonable grounds believes that a water shortage exists or is about to occur within an area it may, despite anything to the contrary in any authorisation, by notice in the Gazette or by written notice to each of the water users in the area who are likely to be affected -

- (i) limit or prohibit the use of water;
- (ii) require any person to release stored water under that person's control;
- (iii) prohibit the use of any waterworks; and
- (iv) require specified water conservation measures to be taken.”

## **B2. Water Services Act**

The following are selected clauses in the Water Service Act that refer 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.”  
It specifies that this duty is subject to:  
(2) (e) “the duty to conserve Water Resources”
- **Clause 13** specifies the contents of a draft Water Services development plan. Clause (j) specifies the following:  
(j) “of existing and proposed water conservation, recycling and environmental protection measures”

## **B3. Water Services Act regulations**

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

- **Clause 10 (1)** “ A Water Services authority must include a Water Services audit in its annual report on the implementation of its Water Services development plan required in terms of section 18(1) of the Act.”
- **Clause 11 (1)** Within two years of the promulgation of these regulations, a Water Services institution must every month.
  - b. “Determine the quantity of unaccounted for water .....
- **Clause 12** “ A Water Services institution must repair any major, visible or reported leak in its Water Services system within 48 hours of becoming aware thereof.”
- **Clause 13** “ A Water Services institution must
  - a. within two years ...fit a suitable water volume measuring device or volume controlling device to all user connections provided with water supply services that are existing at the time of commencement of these regulations”
- **Clause 15** “A Water Services institution must design and maintain every water reticulation system installed after promulgation of these regulations to operate below a maximum pressure of 900 kPa.”

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## **APPENDIX C: DROUGHT AND WATER RESTRICTIONS**

### **C1. Understanding drought and water restrictions<sup>1</sup>:**

Water resource planning is based on a model that reconciles available Water Resources with projected water demand. The available water resource yield is related to the long-term mean rainfall and runoff. A drought occurs when the rainfall is below the long-term mean, which leads to the reduction of storage of water in dams and therefore impacts on the available yield that can be abstracted. Water restrictions are then enforced to reduce the demand until such a time as the dam levels are restored to a safe level. Water restrictions can last for a short or long period depending on the duration of the drought.

### **C2. Comparison of water restrictions and long term WC/WDM<sup>2</sup>:**

Water restrictions need to achieve savings almost immediately once they are implemented and they are therefore usually limited to targeting the behaviour change of consumers. Water restrictions can be punitive and can result in damage to gardens and negatively influence people's lifestyles. A long term WC/WDM strategy however aims to incrementally target water wastage and inefficient use in a prioritised order. The long term WC/WDM strategy is a more comprehensive and balanced approach that aims to achieve water savings from consumer behaviour change as well as technological improvements. The strategy also aims to achieve water savings from all consumer categories (including industrial), target reticulation losses and explore alternative Water Resources to minimise abstraction from the current surface Water Resources. The approach adopted in the strategy is not limited to enforcing water restrictions but includes educating, capacitating and even directly supporting consumers to achieve savings without having a negative impact on economic activity or lifestyles.

### **C3. Benefits of water restrictions towards a long-term WC/WDM strategy<sup>3</sup>**

- Internationally the most successful long-term WC/WDM strategies emerged after droughts and water restrictions. This is mainly due to two reasons: firstly, water institutions become aware of the opportunities and advantages of WC/WDM and secondly water institutions can capitalise on the awareness and behaviour change of consumers.
- If the water restrictions are long enough it stimulates technological improvements and innovation from both the business sector and private individuals. Without restrictions, it is often difficult for water institutions to encourage innovation and entrepreneurship and this requires the introduction of by-laws and incentives. The following are examples of innovations and entrepreneurship identified in

### **C4. Possible negative impact of water restrictions towards a long term WC/WDM strategy<sup>4</sup>**

- If not managed correctly, water restrictions can create a negative impression and opinions amongst the public. The type of opinions that have already been formed by some people and consumers.
- Consumers may feel that there is no longer a need to use water wisely after restrictions are lifted and that water savings are only necessary during a drought.

- A drought often creates an excuse to pursue and accelerate the need for further water augmentation schemes at the possible expense of a long-term WC/WDM strategy. A long-term comprehensive WC/WDM strategy needs to be motivated as an economic alternative to expensive water resource augmentation schemes. The opportunistic rationale sometimes used by decision makers is often linked to the public's uninformed calls for further augmentations and is not necessary based on sound water resource planning. A drought is not necessarily caused by the lack of existing Water Resources schemes but by the reduction of rainfall. The existing Water Resources are planned in accordance with a water resource model that incorporates historical rainfall data and various planning parameters including surety of supply. The occurrence of a drought does not necessarily change the planning model unless it can be proven that the planning parameters need to be modified due to climate change or because the assumptions made in the model are incorrect.

Source: *City of Cape Town: Long Term Water Conservation and Water Demand Management Strategy: April 2007; Consultant: Georgios Constantinides*<sup>1; 2; 3; 4</sup>

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