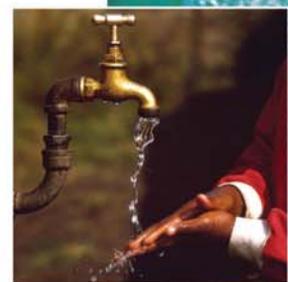
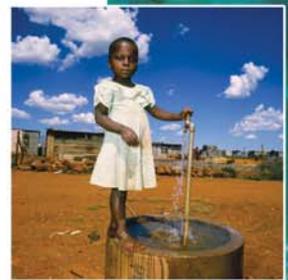




Department: Water Affairs
and Forestry

Water Conservation and Water Demand Management Strategy for the Water Services Sector



August 2004

Foreword

In South Africa, water is key to winning the battle against poverty and its scarcity could be a limiting factor to growth. No socio- economic development can take place without water.

South Africa's water resources are indeed limited and scarce. The situation is worsened by the occurrence of droughts and the increasing demand associated with population growth and a developing economy. As a country, we are approaching the full utilisation of our available water resources. Further water augmentation schemes will be costly and are likely to be detrimental to our environment. We therefore require a strategic change in the use and conservation of our water resources. Our water is a precious resource that has to be used as efficiently as possible before we consider any new water resources development.

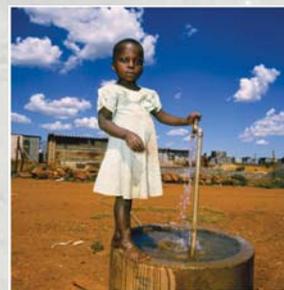
There are opportunities to increase water use efficiency in all water use sectors. Most of the sectors are expected to experience growth and use more water as our country develops. The Water Services sector is no exception to this.

The Water Conservation and Water Demand Management Strategy is a fundamental step in promoting water use efficiency and is consistent with the National Water Act (Act 36 of 1998) which emphasises effective management of our water resources. Water Conservation and Water Demand Management should not be seen as punitive or restrictive but as a responsible approach that will contribute to our prosperity.

All consumers and water institutions have therefore a duty towards our country, our environment and themselves to implement adequate measures that contribute to water use efficiency through Water Conservation and Water Demand Management. The Water Services sector has its role to play in this regard and as outline in this document.

Let us work together towards the prosperity of our nation and for the benefit of future generations by using our water efficiently and by protecting our environment.

Buyelwa Sonjica
Minister of Water Affairs and Forestry
August 2004



Executive Summary

The management of water resources and the provision of water services in South Africa call for a new approach in which Water Conservation and Water Demand Management (WC/WDM) are expected to play a crucial role to ensure environmental sustainability, social equity and economic development.

The National Water Act (Act 36 of 1998) and the Water Services Act (Act 108 of 1997) have provided an enabling environment for WC/WDM. Newly established institutions with roles and responsibilities are expected to integrate WC/WDM into their activities.

This document, focusing on WC/WDM for the Water Services sector, is part of four documents which together, constitute the Water Conservation and Water Demand Management Strategy. It should be read in conjunction with the first of the four documents, the National Water Conservation and Demand Management Strategy (NWC/WDMS). This document outlines the applicable principles and definitions and spells out the eight generic objectives of the overall strategy. The remaining two sectoral strategy documents deal with:

- Agriculture; and
- Industry, Mining and Power Generation.

Each sectoral strategy document provides a detailed background of the sector with regard to WC/WDM, and outlines the expected strategic outputs which are each linked to at least one of the objectives of the overall strategy. For each output, it prioritises the approach that the sector is expected to take and the activities it should carry out in order to give effect to WC/WDM. The three sectoral strategy documents are complementary to the NWC/WDMS. They provide detailed information on each sector, its strategic outputs, prioritised activities and responsibilities of key role-players.

The Water Services sector is expected to play a greater role in water conservation and water demand management in the future. This will be necessary due to the expected growth in water demand in this sector. Water demand is likely to increase comparatively steeply because of a combination of population growth, the increased proportion of the population that will have access to water services (as the current backlog is addressed), and the expected improvement in the standard of living that will result in greater per capita water consumption.

The Strategic Framework for Water Services (September 2003) recognises the role of WC/WDM in ensuring sustainable service delivery.



Table of Contents

Preface / Foreword	1
Executive Summary	2
Table of Contents.....	3
Glossary.....	4
Acronyms.....	5
1 INTRODUCTION	5
1.1 The Water Services Sector and Water Conservation and Water Demand Management	5
1.2 Linkage with the National Water Conservation / Water Demand Management Strategy Document	6
1.3 Structure of the Water Services Sector Strategy document.....	6
2 BACKGROUND	7
2.1 Former white areas	7
2.2 Former black townships	7
2.3 Peri- urban areas or informal settlements	8
2.4 Rural areas.....	8
3 PROCESS AND OBJECTIVES	9
3.1 Process	9
3.2 Objectives of the National Water Conservation and Water Demand Management Strategy	9
4 SITUATION ANALYSIS: CONSTRAINTS AND OPPORTUNITIES	10
4.1 Constraints	10
4.2 Opportunities.....	11
4.2.1 Reduction of leaks in reticulation network distribution leaks	11
4.2.2 Reduction in plumbing leaks in households	11
4.2.3 Retrofit of existing plumbing fittings	12
4.2.4 Reduction in gardening water use	12
4.2.5 Reduction in demand by new consumers - reduction of growth rate.....	12
5 INSTITUTIONAL ROLES.....	13
5.1 The role of the Department of Water Affairs and Forestry	14
5.2 The role of a Catchment Management Agency.....	14
5.3 The role of a Water Services Authority	14
5.4 The role of a Bulk Water Supplier (including Water Boards).....	14
5.5 The role of Water Services Providers.....	14
6 DETAILED OUTPUTS, ACTIVITIES AND ROLE-PLAYERS	15
6.1 Approach.....	15
6.2 Water Services Authorities	15
6.3 Bulk Water Suppliers	19
7 SUPPORTING GUIDELINES AND TOOLS	23
8 CONCLUSION	24
9 REFERENCES	24



Glossary

Demand-side management:

Any measure or initiative that will result in a reduction in the expected water use or water demand.

Distribution management:

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

Inefficient use of water:

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

Integrated Planning:

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.

Non-revenue water:

The total of apparent and real losses plus the proportion of authorised consumption which is not billed)

Retro-fitting:

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

Supply-side management:

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

Unaccounted-for water:

The difference between the measured volume of water put into the supply and distribution system and the total volume of water measured to authorised consumers whose fixed property

address appears on the official list of water services authorities.

Water Institutions:

Water institutions include both Water Management Institutions and Water Services Institutions as defined in the National Water Act and the Water Services Act respectively.

Water wastage:

Water lost through leaks or water usage that does not result in any direct benefit to a consumer or user.

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.

Acronyms

BWS	Bulk Water Supplier
CMA	Catchment Management Agency
CMS	Catchment Management Strategy
IP	Integrated Planning
IWRM	Integrated Water Resource Management
NRW	Non-Revenue Water
NWA	National Water Act
NWC/WDMS	National Water Conservation and Water Demand Management Strategy
NWRS	National Water Resource Strategy
SFRA	Streamflow Reduction Activities
WC	Water Conservation
WfW	Working for Water
WDM	Water Demand Management
WSA	Water Services Authorities
WSAct	Water Services Act
WSDP	Water Services Development Plans
WSI	Water Services Institutions

1. Introduction

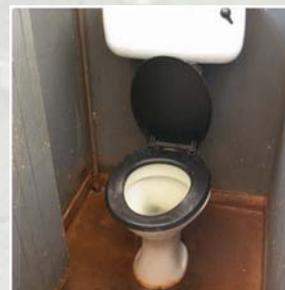
1.1 The Water Services Sector and Water Conservation and Water Demand Management

The Water Services sector represents an overall demand of the order of 19% of the total water use in South Africa. This includes 4% from the rural areas but excludes industries supplied by the Water Services sector. This sector offers the greatest future opportunity for WC/WDM because of the expected growth in water demand within the sector. This demand is likely to increase comparatively steeply because of a combination of:

- Population growth;
- The increased percentage of the population that will have access to water services as the current backlog is addressed; and
- The expected improvement in the standard of living, resulting in greater per capita water consumption.

The Water Services Strategy is one of the three components of the National Water Conservation and Water Demand Management Strategy (NWC/WDMS). The other two components are the Agriculture sector strategy and the Industry, Mining and Power Generation sector strategy. The NWC/WDMS is itself a contribution to the National Water Resources Strategy (NWRS), being a component of Section 3 of Chapter 3 of the NWRS which is the overarching Departmental strategy document.

The development of the NWRS is itself a requirement of the National Water Act (Act 36 of 1998). It sets out ways in which South Africa aims to achieve Integrated Water Resource Management (IWRM). It describes policies, strategies, plans and procedures by which this will be achieved. It includes contributions received from a wide range of stakeholders across the country, within and outside the Department. It is an interactive document that



will continue to grow and change as the needs, capacity and understanding of South Africa changes.

It is expected that the Water Services sector will play a major role in WC/WDM. This document explains the role of Water Services Authorities (WSA) and Bulk Water Suppliers (BWS) in achieving the strategy. Their strategic outputs are linked to the generic objectives of the NWC/WDMS.

1.2 Linkage with the National Water Conservation / Water Demand Management Strategy Document

This document should be read as an expanded version of the section on the Water Services sector in the NWC/WDMS. The reader is advised to obtain generic background information from the NWC/WDMS document, in which:

- Chapter 1 provides the introduction, background, context and legislative development;
- Chapter 2 explains the need for a WC/WDM strategy; and
- Chapter 3 provides the applicable definitions and principles.

1.3 Structure of the Water Services Sector Strategy document

The Water Services strategy document is structured as follows:

- A background to the Water Services sector in South Africa (Chapter 2);
- A description of the process followed to develop the strategy, as well as the overall generic objectives of the NWC/WDMS to which the Water Services sector strategy is a contribution (Chapter 3);

- A situation analysis and the opportunities for WC/WDM in the Water Services sector (Chapter 4);
- A description of the institutional roles (Chapter 5);
- Detailed outputs, their linkage to the generic objectives, activities associated to each and the responsible institution. These activities are provided as a framework for action for achieving the specific output. This chapter constitutes the bulk of the strategy (Chapter 6);
- A description of guidelines and tools to support the implementation of the Water Services sector strategy (Chapter 7); and
- Conclusions (Chapter 8).

2. Background

The Water Services sector offers the greatest opportunity for WC/WDM because of the expected growth in water demand within the sector. Government policy requires that each household receives a free allocation of 6(000 litres of safe reliable water per month. However, a large number of South Africans are yet to enjoy this right, especially in the rural areas.

The water services sector is still characterised by skewed patterns emanating from the apartheid era, although the picture is gradually changing. These areas can be clustered into four categories: the "former white areas", the "former urban black townships", the peri-urban areas (mostly informal settlements) and the rural areas. The four categories are each described below.

2.1 Former white areas

The water services in the former white areas are comparable in standard to those in industrialised countries. The water reticulation systems are generally adequately maintained and with acceptable levels of water losses in the reticulation and distribution systems. Some of the urban commercial and industrial consumers are located in the vicinity of such areas. The majority of domestic water consumers have houses with gardens. Flats are only common in city centres. The average domestic water consumption of home-owners is in excess of 35 kl / month.

The opportunities for WC/WDM, particularly for the domestic consumer, are significant. These opportunities range from more technical changes to simple activities. They include a range of water-saving practices that are easy to implement at household level. However, one of the biggest challenges is the necessity for consistent behavioural and attitudinal changes that require a shift in consumer thinking. Examples of water use efficient activities include water-wise gardening, recycling of used water for car washing and fixing of household leaks. During

droughts, some of these practices are often enforced by local authorities through restrictions. An appropriate water control and pricing structure has the potential to ensure that they become a routine habit. However, care must be taken that the income to a WSI is not adversely reduced, given the importance of the revenue generated from domestic consumers. Any significant reduction in water demand from such paying consumers might jeopardise the financial viability of a WSI and thus its ability to service poorer communities if the appropriate management framework is not in place.

To those industrial consumers depending on the water services from these areas, the discussion under the Industry, Mining and Power Generation sector also applies.

2.2 Former black townships

Unlike the former white areas, the former black townships are characterised by a poorly maintained water reticulation network. As a result, water losses in the distribution and reticulation systems are important. In addition, plumbing leaks in households are a common feature. The combined consequence of these facts is that night flows of the order of 70% of the average daily flow have been recorded in some townships. Illegal connections are also found in some areas, as well as illegal connections to adjacent informal dwellings, similar to the illegal supply of electricity.

A culture of non- payment for services (including water services) developed as a political tool of protest against apartheid. This culture has continued to some extent. Where payment is collected, a flat rate is often charged given that consumer consumption metering is often non-existent. A system of pre-paid water is currently being tested by some water services providers. It is too early to state whether it will be a success despite the potential benefits for consumers who will only be paying for what they consume and



for the water services provider who is guaranteed a fair income for the service provided.

2.3 Peri-urban areas or informal settlements

The current drive to replace informal settlements by low cost housing schemes implies that appropriate water services have to be provided. The challenge is to ensure that such services are of an acceptable standard in order to avoid leakage and other potential sources of water wastage, as described for the former black townships. Educating communities about the potential benefits of being involved in the management and monitoring of water service delivery will ensure that they do not become victims of unscrupulous or incompetent service providers. The sustainability of the services will depend on the ability to maintain the reticulation systems, to minimise household plumbing leakages and to maintain a good assurance of supply so as to justify the payment for those services. Where street standpipes are installed, losses associated with poor control (such as running taps) or illegal connections are widespread. As informal settlements are phased out, the water services situation in these areas is likely to become comparable with the former black townships.

2.4 Rural areas

In the past, most rural areas did not have access to water services, and rural communities relied mostly on water obtained directly from streams or boreholes. Over the last few years a number of projects have been commissioned to supply services that will provide the free water allocation of 6 000 litres per month to each household. The provision of water services to rural areas, however, depends on prevailing local conditions in respect to the possible source of water (surface or ground water), its proximity and the population density. Providing water to within 200 metres of a household, as required by the minimum

standard of services, can be a challenge. Reasons include the low population density and the cost of pumping water from sources that are situated much lower than the dwellings to be supplied. In some cases, wastage through poor control of standpipes also occurs. The problem is compounded by the fact that most consumers with limited water consumption cannot afford to pay for the cost of being supplied with water. Targets for cost recovery for the water services authorities or providers in charge of these areas are often not achieved and government intervention, by way of subsidies or administrative support, is often required.

The opportunity for WC/WDM in rural areas will be to contribute to the sustainability of the services once they have been developed. Although total water use in rural areas is only 4% of the total demand of South Africa, a strategic intervention of WC/WDM will add to the economic and financial viability of water services to rural communities. WC/WDM must, therefore, promote responsible community-based management of water services. The implementers of a WC/WDM programme or activity in the rural areas must be able to show the benefits by documenting reduced water wastage through minimising/eliminating running standpipes, leakage and vandalism.

3. Process and objectives

3.1 Process

This strategy is the result of a process that began with a consultative workshop in July 1999, and has included:

- Distribution of the draft Strategy document to all workshop participants for comment;
- Review of all comments received by a steering committee;
- Distribution of the edited version to a wider scope of key role-players and interested parties for comment;
- Consolidation and final review based on all comments received by the steering committee;

- Submission of the Strategy to departmental management structures for review; and
- During the process, pilot studies were undertaken to support and test the strategy and associated guidelines and tools.

3.2 Objectives of the National Water Conservation and Water Demand Management Strategy

The strategic outputs of the Water Services Sector Strategy, as further detailed in Chapter 5, are each linked to at least one of the objectives of the NWC/WDMS in order to demonstrate their contribution to the overall WC/WDM strategy. The generic objectives of the NWC/WDMS are given in [Table 1](#).

Table 1: National Water Conservation / Water Demand Management Strategy Framework Objectives

Objective	Description of Objective
Objective 1	To facilitate and ensure the role of WC/WDM in achieving sustainable, efficient and affordable management of water resources and water services
Objective 2	To contribute to the protection of the environment, ecology and water resources
Objective 3	To create a culture of WC/WDM within all water management and water services institutions
Objective 4	To create a culture of WC/WDM for all consumers and users
Objective 5	To support water management and water services institutions to implement WC/WDM
Objective 6	To promote the allocation of adequate capacity and resources by water institutions for WC/WDM
Objective 7	To enable water management and water services institutions to adopt integrated planning
Objective 8	To promote international co-operation and participate with other Southern African countries, particularly basin-sharing countries, in developing joint WC/WDM strategies



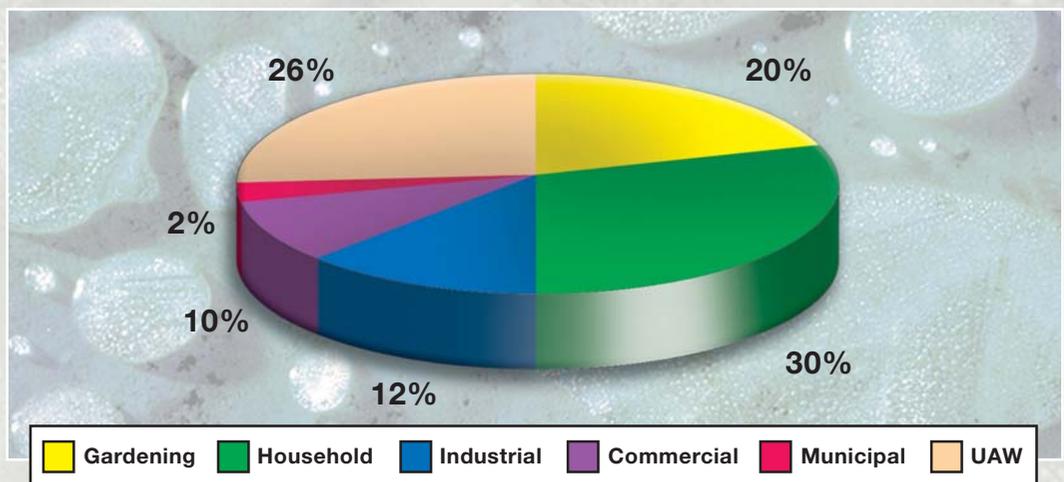
4. Situation analysis: constraints and opportunities

This chapter analyses the context of the Water Services sector in South Africa, outlining the constraints and opportunities for WC/WDM.

4.1 Constraints

There is currently no consolidated database of information for water use from Water Services Authorities (WSA) in South Africa. **Figure 1** indicates estimated average water use based on information obtained from Rand Water, Durban Water and Waste and Cape Town City Council.

Figure 1: Water use in the urban water use sector (national estimated average)



The strategy for the Water Services sector does not address the industrial water use component, as reflected in **Figure 1**. This is included in the Industries, Mining and Power Generation sectoral strategy component of the NWC/WDMs.

The following are some of the general features characteristic of the Water Services sector in South Africa. In developing their own WC/WDM programmes, the various Water Services Institutions (WSI) have to assess the constraints and opportunities of their own specific circumstances.

Some of the common constraints preventing or restricting the implementation of WC/WDM in the Water Services sector include:

- *Financial constraints:* Although the economic benefits in implementing various WC/WDM measures can be easily justified, WSIs are

often financially constrained and may not have adequate financial resources to invest in such measures. As an example, low cost housing projects resort to the cheapest fittings (e.g. toilets and taps) without regard to operating and running costs;

- *Planning constraints:* Current planning practices in the Water Services sector are often focused on supply-side management and only consider infrastructure development as an option;
- *Institutional constraints:* There is sometimes a lack of co-ordination among the various role-players in the water supply chain during the planning process (including the Department, bulk water suppliers and local authorities). There has been inadequate clarity on institutional arrangements, roles and responsibilities;

- *Capacity constraints:* There is often limited technical and managerial capacity available to plan, implement and maintain WC/WDM measures;
- *Technical constraints:* There is a lack of appropriate WC/WDM planning tools and guidelines available and no adequate standards and enforcement for plumbing products; and
- *Social constraints:* In certain areas, there is a low level of payment for services. Water wastage can be attributed to the lack of awareness of the benefits of water conservation and demand management. In other instances, WC/WDM measures are also only perceived as drought relief mechanisms.

Other constraints include:

- Historically in most WSAs, there has been a lack of adequate co-ordination of water services functions, as well as a lack of integration and co-operation within the different departments. Little emphasis has been placed on adequate customer care, information and functions carried out by the corporate services units. There has been very little integration of these units with the technical functions;
- WSAs generally focus on other challenges, and WC/WDM is not perceived as a priority;
- There is a general lack of commitment to WC/WDM by local authorities and other key role-players. WC/WDM is often portrayed as negative and restrictive to consumers;
- Water services providers often lack the knowledge and understanding of consumers' needs and water use patterns; and
- Most service providers do not have appropriate information and adequate management information systems.

4.2 Opportunities

The following analysis illustrates the estimated opportunities in reducing demand in most water services areas and illustrates the methodology that WSAs should undertake in developing their own specific demand targets. Estimates are based on sectoral usage information illustrated in **Figure 1** and on general information obtained from WC/WDM studies in various urban areas.

4.2.1 Reduction of leaks in reticulation network distribution leaks

It is estimated that, by implementing effective distribution management measures, the Unaccounted-for Water (UAW) can be reduced to 11%, which will result in a saving of 15% of total demand.

This can be achieved through adequate and technically correct operating and maintenance measures of the reticulation network system. Pipe network replacement or rehabilitation should also be undertaken. An accepted general norm is to replace the reticulation network every 50 years but this can vary with circumstances. WSIs can undertake the following measures to reduce distribution leaks:

- i. Leak detection and repair;
- ii. Pressure management;
- iii. Effective zoning of the distribution system;
- iv. Repair of visible and reported leaks;
- v. Pipe replacement / management programme;
- vi. Cathodic protection of pipelines;
- vii. Meter management programme; and
- viii. Unauthorised connection programme.

4.2.2 Reduction in plumbing leaks in households

The average water wastage due to plumbing leaks is estimated as 20% of total indoor household water use. Plumbing leaks include



any leaks on the consumer side of the connection and include leaks within the connection pipe, leaking taps, leaking toilets and leaking hot water geysers.

Repair of plumbing leaks can be achieved by the following related activities initiated by WSIs:

- i. Leak repair projects in the "former urban black townships" sponsored by water institutions (re-addressing the apartheid plumbing of council houses);
- ii. Communication and education campaigns; and
- iii. Ensuring payment of services through credit control measures.

4.2.3 Retrofit of existing plumbing fittings

It is estimated that, by replacing existing plumbing fittings with more efficient fittings, household and commercial water consumption can be reduced by an average of 40%.

Opportunities in retrofitting of plumbing fittings include fitting dual-flush or interruptible toilets, user-activated urinals, low flow shower heads and tap controllers and aerators. WSIs can undertake the following activities to achieve retrofitting:

- i. Retrofit projects in the "former urban black townships" sponsored by the water institutions (combined with leak repair projects described above);
- ii. Communication and education campaigns;
- iii. Grant incentive schemes where water institutions will pay the consumer part of the retro-fit costs;
- iv. Regulations and by-laws;
- v. Marketing and research of new technology; and
- vi. School audits.

4.2.4 Reduction in gardening water use

It is estimated that, by increasing the efficiency of gardening water use, total consumption can

be reduced by 6% to 30% of the total gardening water use. Opportunities in reducing the water used for gardening include water-wise plants, mulching, efficient irrigation systems, irrigation scheduling, rainwater harvesting and recycling of wastewater.

Reduction in gardening water use can be achieved by WSIs through the following activities:

- i. Communication and education campaigns, including water-wise demonstration exhibits;
- ii. Block rate tariffs;
- iii. Regulations and by-laws;
- iv. Research of new technology such as linking soil moisture monitors to automatic garden irrigation systems; and
- v. Grant incentive schemes for lawn replacement, and zero-scaping where water institutions can pay part of the costs to change existing gardens.

4.2.5 Reduction in demand by new consumers - reduction of growth rate

Opportunities to reduce water demand by new consumers include selecting appropriate levels of service for different communities, efficient plumbing fittings, efficient reticulation design practices and pre-payment meters. This can be achieved by WSIs through the following activities:

- i. Installation of pre-payment systems (if economically, technically and socially viable);
- ii. Effective billing systems;
- iii. Communication and education campaigns;
- iv. Regulations and by-laws;
- v. Negotiations and incentives to developers;
- vi. Improved reticulation design and plumbing standards; and
- vii. A high level of operation and maintenance, with rapid response to bursts and leaks.

5. Institutional roles

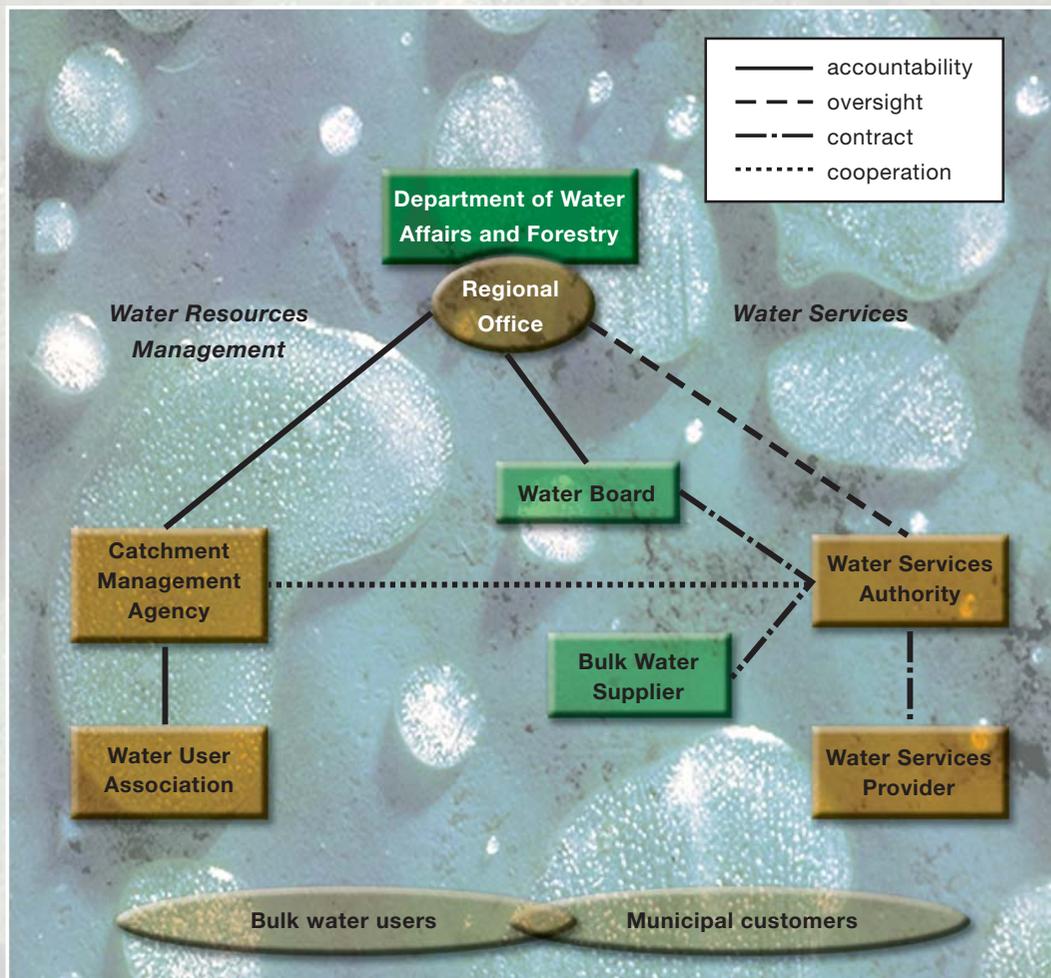
The roles and relationships of the various water sector institutions in respect to WC/WDM are reflected in **Figure 2**. Supporting comments provide a consolidated overview of the different WC/WDM roles and functions of the various water institutions.

It is important to note the different operational boundaries for water resources management and water services. Water resources management is undertaken on a catchment basis, whereas water services are provided according to municipal demarcation. This introduces complexity into the management of relationships between the Catchment

Management Agency (CMA) and the Water Services Institutions (WSI).

CMAs are responsible for Water Resources Management (WRM) planning and implementation at a Water Management Area (WMA) level. This includes the entire scope of WC/WDM. However, it is envisaged that a WSI will have a greater focus on demand management for domestic and industrial use within its area of jurisdiction. Each CMA will co-ordinate the activities of those WSIs falling within the WMA, possibly one or more bulk water suppliers and a number of WUAs.

Figure 2: Roles of water sector institutions for WC/WDM



5.1 The role of the Department of Water Affairs and Forestry

The role of the Department with respect to WC/WDM is a generic role and is applicable to all water use sectors. It includes:

- a) Create an enabling policy and regulatory environment for water services;
- b) Co-ordinate national functions;
- c) Develop generic tools and guidelines;
- d) Develop policies and regulations and ensure implementation;
- e) Perform general regulatory functions;
- f) Co-ordinate measures to create an education and awareness culture throughout South Africa;
- g) Promote WC/WDM to all water services institutions; and
- h) Monitor the implementation of WC/WDM by WSIs.

5.2 The role of a Catchment Management Agency

The role of a CMA with respect to WC/WDM is:

- a) Include WC/WDM as part of its Catchment Management Strategy consistent with the NWRS;
- b) Set conditions for water use authorisations;
- c) Ensure the implementation of NWA regulations;
- d) Develop an implementation plan for the WC/WDM component of its Catchment Management Strategy (CMS); and
- e) Ensure and monitor the implementation of WC/WDM by Bulk Water Suppliers (BWS) and the WSAs within its jurisdiction.

5.3 The role of a Water Services Authority

The role of a WSA with respect to WC/WDM is:

- a) Include WC/WDM as part of its Water Services Development Plan (WSDP) consistent with the NWRS and the CMS of the CWA within which it operates;
- b) Develop an implementation plan for the WC/WDM component of its WSDP; and
- c) Ensure and monitor the implementation of WC/WDM by the WSPs and their BWSs.

5.4 The role of a Bulk Water Supplier (including Water Boards)

The role of a BWS, as a water services provider, with respect to WC/WDM is that assigned by the CMA and WSA as described above. Where some of the BWSs, especially Water Boards, may have sufficient capacity, they may be expected to:

- a) Contribute to the development of the WC/WDM component of the CMS or WSDP;
- b) Assist weak WSAs in the implementation of WC/WDM measures, when required;
- c) Implement WC/WDM measures directly related to their service provision functions; and
- d) Co-ordinate the implementation of WC/WDM measures (including communication campaigns).

5.5 The role of Water Services Providers

The role of WSPs is to implement, in collaboration with the WSA, the WC/WDM component of the WSDP assigned by the WSA and as described in the WSDP.

6. Detailed outputs, activities and role-players

6.1 Approach

The outputs of the WC/WDM strategy for the Water Services sector are linked to at least one of the objectives of the NWC/WDMS. They are grouped into two sections for the WSAs and the Bulk Water Suppliers.

The strategic outputs for WSAs are summarised in **Table 2** and the list of activities for each output

is detailed in **Tables 3 to 9**. The strategic outputs for Bulk Water Suppliers are summarised in **Table 10** and the list of activities for each output is detailed in **Tables 11 to 16**.

6.2 Water Services Authorities

The strategic outputs that are expected from WSAs in their specific WC/WDM programmes are described in **Table 2**.

Table 2: Strategic Outputs for Water Services Authorities and links to the NWC/WDMS framework of objectives

Output	Description of Output	Link to Objectives
1	Implement efficient distribution management measures	5
2	Ensure adequate information to support decision-making	3 and 5
3	Promote the efficient use of water to consumers and customers	4
4	Adopt integrated planning principles	7
5	Ensure the implementation of WC/WDM best practices in new developments	3
6	Contribute to the Catchment Management Strategy (CMS)	1 and 5
7	Ensure adequate institutional and financial capacity for WC/WDM.	6



Table 3: Description of activities for Output 1: Implement an efficient distribution of management measures

Priority No.	Activity	Responsible institutions
1	Establish and maintain the integrity of water zones and districts for the entire water supply system	WSA, WSP
2	Monitor the level of UAW continuously for each district and zone	WSA, WSP
3	Reduce and maintain the level of UAW to acceptable standards and benchmarks using best management practices	WSA, WSP
4	Implement a consumer meter management programme	WSA, WSP
5	Implement a pressure management programme	WSA, WSP
6	Implement a pipeline maintenance and replacement programme	WSA, WSP
7	Implement efficient effluent management systems	WSA, WSP
8	Install measuring devices to all existing consumer connections	WSA, WSP

Table 4: Description of activities for Output 2: Ensure adequate information to support decision-making

Priority No	Activity	Responsible institutions
1	Determine and monitor various future demand scenarios based on water demand trends and WC/WDM measures	DWAF, CMA, WSA, WSP
2	Produce a monthly water audit and a water balance that can be validated	WSP
3	Develop an information system to assist with customer care functions and queries	DWAF, WSP
4	Develop measurable key performance indicators of various functions and monitor the actual performance against these at appropriate intervals	DWAF, CMA, WSA
5	Produce monthly deviation reports of water consumption	WSP
6	Establish and maintain an effective consumer database	WSP

Table 5: Description of activities for Output 3: Promote the efficient use of water to consumers and customers

Priority No	Activity	Responsible institutions
1	Develop an appropriate and ongoing marketing, communication and education programme	DWAF, CMA, WSA, WSP
2	Implement water tariffs that promote social equity and promote efficient use of water	CMA, WSA
3	Ensure the payment of water services by all consumers	WSA, WSP
4	Identify, prioritise and implement WDM measures (to be viable through the IP process)	CMA, WSA
5	Reduce unauthorised connections	WSA, WSP
6	Assess the departmental water usage by WSA and establish, achieve and maintain appropriate demand targets	WSA
7	Prohibit and enforce the wasteful use of water by consumers and users	WSA, WSP



Table 6: Description of activities for Output 4: Adopt Integrated Planning principles

Priority No.	Activity	Responsible institutions
1	Integrate the planning of bulk water supply infrastructure with the planning of bulk effluent infrastructure	DWAF, CMA, WSA
2	Co-ordinate planning and WC/WDM measures with other water institutions in the water supply chain and in accordance with any regional WC/WDM and catchment management strategies or requirements	DWAF, CMA, WSA
3	Identify all possible WC/WDM measures and evaluate their feasibility in comparison to the augmentation of any proposed bulk infrastructure project	DWAF, CMA, WSA
4	Determine and regularly review the best combination of supply-side management and demand-side management options as part of the master plan planning study (to delay capital outlay for infrastructure development)	DWAF, CMA, WSA
5	Ensure the adequate allocation of funding and resources to WC/WDM measures	DWAF, CMA, WSA
6	Determine and review annually 2, 5 and 10-year demand target goals (based on the IP planning guidelines, appropriate demand analysis and regional demand objectives)	DWAF, CMA
7	Implement measures to monitor the impact of WC/WDM	DWAF, CMA, WSA

Table 7: Description of activities for Output 5: Contribute to the Catchment Management Strategy (water resource management strategy)

Priority No.	Activity	Responsible institutions
1	Ensure the quality of treated effluent meets required standards	DWAF, CMA, WSA
2	Minimise leaks of the effluent collection system	WSA
3	Maximise recycling and reuse of water where it is feasible	WSA
4	Promote the reduction of pollution by consumers	DWAF, CMA, WSA

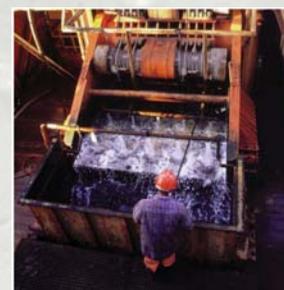
Table 8: Description of activities for Output 6: Ensure the implementation of Water Conservation / Water Demand Management best practices in new developments

Priority No	Activity	Responsible institutions
1	Ensure the development and implementation of appropriate standards for new developments, which promote efficiency (particularly with low cost housing to ensure sustainable services)	DWAF, CMA, WSA
2	Ensure that all new connections have a measuring device	WSA
3	Where feasible, ensure the removal of invasive alien plants before development takes place	DWAF, CMA, WSA
4	Implement incentive schemes for developers to adopt WC/WDM measures and standards	WSA
5	Ensure that every water services work or consumer installation complies with SABS 0252: Water Supply and drainage for buildings and SABS 0254: The installation of fixed electric storage water heating systems	WSA
6	Ensure that all plumbing fittings comply with SABS standards or the JASWIC list of accepted fittings	WSA



Table 9: Description of activities for Output 7: Ensure adequate institutional and financial capacity

Priority No	Activity	Responsible institutions
1	Review and if needed modify the organisation structure and work ethic	WSA, WSP
2	Develop and implement a training programme for all key personnel	DWAF, CMA, WSA, WSP
3	Key personnel to attend relevant conferences and forums	DWAF, CMA, WSA
4	Identify and investigate both internal and external sources to fund WC/WDM projects	DWAF, CMA, WSA
5	Empower by informing, educating and capacitating officials, councillors and other relevant role-players about WC/WDM and IP	DWAF, CMA, WSA



6.3 Bulk Water Suppliers

Bulk Water Suppliers (BWS), including Water Boards, have an important role to play in integrating, planning and co-ordinating the WC/WDM targets and activities within their area of supply. The strategic outputs that are expected from all BWSs in their specific WC/WDM programmes are described in **Table 10**.

Table 10: Strategic Outputs and activities for Bulk Water Suppliers

Output	Description of Output	Link to Objectives
1	Participate in the planning of water resources for the region and facilitate the integration of all bulk supply planning in the supply chain	7
2	Facilitate the development of an overall future demand target for the region and for all individual WSA	5
3	Assist and promote the implementation of WC/WDM measures by WSAs and all consumers	3, 4 and 5
4	Monitor the implementation of WC/WDM measures	3 and 5
5	Co-ordinate the implementation of a generic water education and awareness campaign	3 and 4
6	Identify and negotiate co-operation on WC/WDM with other competing users in the catchment	3 and 7

Table 11: Description of activities for Output 1: Participate in the planning of water resources for the region and facilitate the integration of all bulk supply planning in the supply chain

Priority No	Activity	Responsible institutions
1	Facilitate the integration of bulk infrastructure planning for water service for the region	BWS, CMA, WSA, DWAF[RJB1]
2	Participate and take partial responsibility for regional water resource planning	BWS, CMA, WSA, DWAF
3	Determine the best combination of regional supply side management and demand side management measures	BWS, CMA, WSA, DWAF

Table 12: Description of activities for Output 2: Facilitate the development of an overall future demand target for the region and for all individual Water Service Authorities

Priority No	Activity	Responsible institutions
1	Determine optimal demand targets for each WSA and consumer and negotiate and agree on targets in association with a WC/WDM programme	BWS, WSA, CMA, WSA, DWAF
2	Develop various future demand scenarios and obtain agreement and consensus on a regional target	BWS, CMA, WSA, DWAF

Table 13: Description of activities for Output 3: Assist and promote the implementation of Water Conservation / Water Demand Management measures by Water Service Authorities and all consumers

Priority No	Activity	Responsible institutions
1	Facilitate a regional forum that meets regularly	BWS, CMA, WSA, DWAF
2	Assist WSA in acquiring adequate funds and resources to implement WC/WDM measures	BWS, CMA, DWAF
3	Assist WSA in acquiring the necessary skills (empower, educate, capacitate)	DWAF
4	Develop economic analysis models for various WC/WDM measures	DWAF, CMA
5	Develop incentives for WSA and other bulk consumers to implement WC/WDM	DWAF, CMA
6	Implement pilot projects and case studies	BWS, DWAF, CMA, WSA
7	Facilitate the co-ordination, networking and sharing of information between the key role-players in the industry	DWAF, CMA, BWS, WSA
8	Develop measures to interact with and understand social water requirements and needs	DWAF, CMA
9	Incorporate WC/WDM requirements within the water supply conditions to all consumers	BWS, WSA, CMA, DWAF
10	Develop a tariff system that promotes efficiency and integrates the principles of both departmental tariff system and the tariff policies of WSA	DWAF, WSA, CMA, BWS

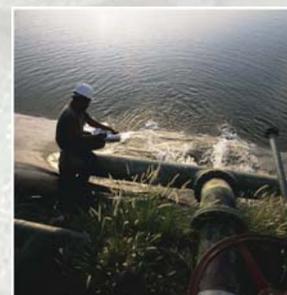


Table 14: Description of activities for Output 4: Monitor the implementation of Water Conservation / Water Demand Management measures

Priority No	Activity	Responsible institutions
1	Facilitate the development of a regional Management Information System (MIS)	BWS, WSA, CMA, DWAF
2	Develop a regional GIS system that is linked to the MIS	BWS, WSA, CMA, DWAF
3	Identify all WC/WDM related projects and initiatives by all bulk consumers and WSA	BWS, WSA, CMA, DWAF
4	Facilitate with WSA and other bulk consumers the implementation of research measures to monitor the impact of WC/WDM	BWS, WSA, CMA, DWAF
5	Install and maintain a system of bulk meters that will facilitate a monthly water balance that monitors demands for each consumer and for each bulk supply system	BWS, WSA, CMA
6	Carry out a monthly water balance for the entire region and highlight any significant discrepancies or changes in demand	BWSP, WSA, CMA

Table 15: Description of activities for Output 5: Co-ordinate the implementation of a generic water education and awareness campaign

Priority No	Activity	Responsible institutions
1	Assist in the regional co-ordination and implementation of the national water education projects	DWAF, CMA, WSA
2	Carry out social surveys and research to determine common perceptions, opinions and knowledge regarding water education and awareness	DWAF, CMA, WSA
3	Develop a consolidated regional awareness programme on WC/WDM targeting various consumer categories.	DWAF, CMA

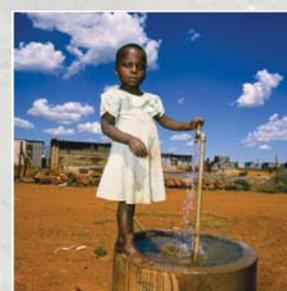
Table 16: Description of activities for Output 6: Identify and negotiate co-operation on Water Conservation / Water Demand Management with other competing users in the catchment

Priority No	Activity	Responsible institutions
1	Identify potential co-operation in assisting other competing consumers to become more water efficient and to develop and implement WC/WDM programmes	BWS, CMA, WSA
2	Identify potential co-operation and assistance with other users to minimise the effect of drought conditions	BWS, CMA, WSA

7. Supporting guidelines and tools

The following guidelines and tools were developed to support the implementation of the WC/WDM strategy for the Water Services sector. The SABS standards that are provided also support the strategy.

- DWAF, February 2004. Water Conservation and Water Demand Management - A Planning Framework for Catchment Agencies (Draft), Guidelines for Water Conservation and Demand Management, Volume 1 of 3;
- DWAF, February 2004. Undertaking a Water Conservation and Water Demand Management Situation Assessment and Development of a Business Plan within the Water Services Sector (Draft). Guidelines for Water Conservation and Demand Management, Volume 2 of 3;
- DWAF, February 2004. Implementation of Water Conservation and Water Demand Management Measures within the Water Services Sector (Draft). Guidelines for Water Conservation and Demand Management Volume 3 of 3;
- SABS 0252: Water Supply and drainage for buildings;
- SABS 0254: The installation of fixed electric storage water heating systems; and
- SABS 0306: The management of potable water in distribution systems.



8. Conclusion

8.1. Contribution of the Water Conservation / Water Demand Management strategy of the Water Services Sector to the National Water Conservation and Water Demand Management Strategy and to the National Water Resources Strategy

This document constitutes part of the section on the Water Services sector of the NWC/WDMS that is the basis of Section 3 of Chapter 3 of the NWRS. The three documents are consistent and each provides sufficient detail at its level.

The water services sector will play a significant role in WC/WDM for a number of reasons, and will contribute to postponing the need for developing new infrastructure. One of the key reasons is the expected growth in the demand for water for domestic use to address current backlogs.

8.2. Future reviews of the National Water Resources Strategy

As the NWRS will be reviewed every five years, the NWC/WDMS will also be reviewed at similar intervals so that the appropriate contributions to the NWRS can be made. As WC/WDM is implemented, some of the eight objectives might become redundant. The local and regional water sector might also dictate other substantial reviews of the NWC/WDMS. The lessons to be learnt during the implementation of the strategy for the Water Services sector will contribute to these reviews.

8.3. Challenges

In an endeavour to cover all the possible opportunities for WC/WDM in the Water Services sector, this strategy has highlighted opportunities for achieving efficient use in this sector. The challenge is to translate the strategy into concrete actions so that future generations can enjoy the

benefits that the Department wishes to preserve for them.

This requires commitment of resources and a systematic implementation of the actions outlined in the strategy. The Water Services sector holds the most challenges for this implementation in that it depends strongly on both the customers and the local authorities responsible for the provision of water services. Including WC/WDM in the WSDP alone will not be sufficient and a coherent implementation strategy will be required. It will not only need a specific focus on customer needs and education but also the responsible authorities will need to demonstrate their own commitment to WC/WDM.

REFERENCES

- DWAF, 2003. Draft National Water Resources Strategy
- DWAF, 2003, Strategic Framework for Water Services.
- Government Gazette, 1998. National Water Act (*Act 36 of 1998*)
- Government Gazette, 1997. Water Services Act (*Act 108 of 1997*)