Water Services Development Plan

Chapter 6

Environmental Issues
of

City of Cape Town

Status: Comprehensive WSDP

www.capetown.gov.za/water/wsdp

December 2001

Table of Contents

List of Tables

List of Figures

List of Abbreviations

AADD	Annual Average daily demand
AFU	Automatic Flushing Urinal
CCT	City of Cape Town
CFA	Cape Flats Aquifer
CMA	Cape Metropolitan Area
CMC	Cape Metropolitan Council
DM	Demand Management
DWAF	Department of Water Affairs and Forestry
EIA	Environmental Impact Assessment
GLS	Geustyn Loubser Streicher Inc
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
IMEP	Integrated Metropolitan Environmental Policy
IWRP	Integrated Water Resource Planning
MCDA	Multi-Criteria Decision Analysis
MNF	Minimum Night Flow
MLC	Metropolitan Local Council
PNE	Protected Natural Environment
PDG	Palmer Development Group
UAW	Unaccounted For Water
URV	Unit Reference Value
WC	Water Conservation
VIP	Ventilated Improved Pit Latrine
WDM	Water Demand Management
WSDP	Water Services Development Plan
WTW	Water Treatment Works
WWTW	Wastewater Treatment Works

Chapter 6

Environmental Issues

6 Environmental Issues

Issues:

- Fluoridation Regulations;
- Compliance with special standards for discharging of treated effluent into a river system;
- Water quality

6.1 Environmental Management Initiatives

6.1.1 Introduction

Management of the environment of the City of Cape Town (CCT) is guided by emerging national as well as international law and legislation. All initiatives must conform to these higher order statutes and directives, such as the International Convention on Biodiversity and the National Environmental Management Act (NEMA). The CCT through the former Cape Metropolitan Council (CMC) has implemented a number of initiatives to monitor the environmental status, protect the environment and set standards in accordance with the relevant Acts.

6.1.2 State of the Environment Report

The former CMC has initiated a comprehensive process called the "State of Environment Report" (http://www.cmc.gov.za/soe) to report on the current status of the environment and many issues relating to the WSDP that may impact on the environment taking cognisance of the relevant Acts. The CCT has continued this process, which is now in its third cycle.

6.1.3 Environmental Conservation Act

In order to safeguard the environment against activities that could have a detrimental effect on the environment, regulations in terms of Sections 21, 22 and 26 of the Environmental Conservation Act (ECA) (No. 73 of 1980) were promulgated on 1997-09-05. According to these regulations an environmental Impact Assessment (EIA) is a legal requirement for certain scheduled construction activities.

The CMC Administration subscribes to a philosophy of Integrated Environmental Management (IEM) and has adopted an Integrated Metropolitan Environmental Policy (IMEP) GO TO and is initiating Environmental Management Systems (EMS) for its operations.

As an integral component of the IEM guidelines, the former CMC commissioned the development of procedures to ensure compliance with the environmental regulations for all the CMC river maintenance / upgrading activities as well as their bulk wastewater activities. These procedures which are supported by the delegated authority (viz. the Environmental Impact Management Unit of the Provincial Department of Environmental and Cultural Affairs and Sport (DECAS)), aim to ensure compliance with the regulations and the spirit of the environmental regulations and the IMEP, without unduly compromising efficient and cost effective service delivery with the CMA.

The former CMC's IEM guidelines subscribe to the "cradle to grave" approach, requiring environmental input from conceptualisation to decommissioning for all its operations. Accordingly, the IEM guidelines aim to ensure upfront environmental input during planning and construction and subsequent input during operation and maintenance (via the implementation of the appropriate EMS).

Bulk Water Department:
The Bulk Water Department of the former CMC is currently using a modified version of the protocol developed for the Wastewater Department in order to determine whether their proposed capital projects would have any environmental impacts. This checklist is then discussed with the CMC Administration's Environmental Management Department.

Bulk Wastewater Department:
A protocol for capital development works was developed by the former CMC's Wastewater Department, the environmental unit of the CMC Administration's Planning, Environmental and Housing Directorate in conjunction with consulting engineers Ninham Shand and approved by DECAS. A checklist answer sheet and description form applicable to the capital works is completed to identify the category of the proposed works relative to the environmental requirements. Thereafter the necessary environmental procedures are followed, if necessary by appointing environmental consultants.

6.1.4 Environmental Management Plan

Environmental Management Programmes (EMPs) is a tool that would facilitate appropriate environmental input during the construction phase of civil engineering projects, and thus form a crucial component of the IEM process and the ultimate attainment of sound environmental practice. Accordingly, the CMC Environmental Management Department appointed a team of consultants under the leadership of Ninham Shand to develop a state-of-the-art, Environmental Management Programme, including Standard Environmental Specifications, Detailed Environmental Specifications and a range of supporting tools to facilitate the implementation of civil projects.

The vision is for this EMP to be included as an integral component of the Contract Documentation of all construction contracts, initiated by the City's line function that oversee construction activities, where there is a risk of environmental degradation or there is uncertainty regarding the environmentally sensitivity of the activity. Ultimately this approach will ensure the practical and effective implementation of environmental controls for these activities.

6.1.5 Integrated Metropolitan Environmental Policy

The CCT has embarked upon a process of developing an integrated metropolitan environmental management strategy (IMEMS). This Integrated Metropolitan Environmental Policy (IMEP) will form the basis for a series of strategies and programmes to ensure that the principles of sustainability are adhered to. This will enable the meeting of current needs as well as the maintenance of our resources for the benefit of future generations. The IMEP and the IMEMS were adopted by the CCT in October 2001. The sectoral strategy for water services based on the IMEP is given below:

A commitment to ensuring that the quality of coastal, marine and inland waters of the CCT is suitable for the maintenance of biodiversity, the protection of human health and a commitment to the principle that all CCT inhabitants have the right to clean, potable and adequate water sources. This commitment includes:

- *Recognising that water is a scarce and valuable resource, which sustains communities, ecosystems and economic development.*
- *Recognising the importance of groundwater as a water resource.*
- *Management of water demand to ensure the long term sustainability and affordability of water resources and the environment.*
- *Ensuring water quality, at a minimum, meets national standards as established by the Department of Water Affairs and Forestry.*
- *The effective management of all wastewater systems.*

6.2 Water Conservation and Quality Issues

6.2.1 Quality of Raw water resources

Tastes and odours in drinking water, produced by algae, out of the Voëlvlei Dam caused considerable consumer response during December 2000 and January 2001. During November 2001 consumers complained about tastes and odours in water from Theewaterskloof Dam, because of an algae not encountered previously. The removal of tastes and odours from drinking water costs several million Rand per annum. Algal blooms are caused by inputs of nutrients into dams. This situation could escalate in the future if it is not addressed.

In order to at least stabilise and hopefully reduce the influx of nutrients and subsequent algal blooms, serious and urgent catchment management is required by the responsible authorities.

6.2.2 Potable Water Quality Monitoring

The quality of treated water is strictly monitored/controlled by the water treatment division and complies to SABS 241 (1984) and other guidelines. The Scientific Services Department conduct weekly visits to each WTP to test the water, inspect the process, retrieve various samples and analyse them. The results are then scrutinised, evaluated and compiled as a weekly report with comments. The WTP manager is given a copy of the results, one copy is sent to the Head of Bulk Water Operations and one is kept by Scientific Services. Composite sampling is carried out by the WTP on a weekly basis and these samples are also analysed by the Scientific Services Branch and a monthly report is generated. Immediate response to operational problems and consumer complaints is effected by suitable experienced and qualified staff from Water Services. For details on raw water quality and treated water quality refer to table entitled "Water Treatment Data" GO TO.

6.2.3 Implementation of Fluoridation Regulations

In terms of Regulations No. R823, dated 8 September 2001, promulgated under Health Act 63 of 1977, all water services providers are required to ensure a fluoride concentration of 0.7 mg/l in potable water for the purposes of reducing dental caries. Fluoridation is complex, expensive and a potentially hazardous undertaking and requires the implementation of new infrastructure by September 2003 at an estimated cost of R11 mil, since the natural concentration of fluoride in CCT's water resources is insufficient. The running cost of fluoridation is estimated at R10mil per annum. Skilled operators required to manage the fluoride concentration are currently inadequate, and requires the training of additional staff. CCT have embarked on a public participation process. A report as tabled to the Trading Services Portfolio Committee gives more background. GO TO

6.2.4 Treated sewage effluent released into Urban River systems

In recognition of the special effluent standards which are to be imposed by DWAF, the Wastewater Department took the policy decision to implement special standards with respect to nutrient removal in wastewater treatment at treatment works where discharge of treated effluent is into a river system. This is in line with environmental considerations and is an earnest intention to improve water quality, minimise health risks and protect the environment. Effluent permit standards have been determined for each wastewater treatment plant.

6.2.5 Impact of Industrial Consumers and Potential Pollution Sources

Effluent from industrial consumers generally is discharged into the sewage system and treated at the wastewater treatment works and is therefore not considered as a pollution treat.

6.2.6 Removal of Alien Vegetation

The CCT has an ongoing programme for the removal of alien vegetation in the catchment areas of their dams. This programme will have the effect of increasing available run-off. The CCT also make a substantial contribution (R20 million) for the removal of alien vegetation in DWAF catchments, through a catchment management charge.

6.2.7 Atlantis Aquifers

An Environmental Management System (EMS) has been completed for the Atlantis Aquifer System. An environmental consultant audits the EMS on an annual basis. In addition an environmental officer for the area was appointed in July 1999, to safeguard the environment, water supply infrastructure and to educate the public. The Council for Scientific and Industrial Research (CSIR) assist in monitoring water quality and aquifer levels on a regular basis. In terms of the National Water Act (1998), aquifers are protected by law.

6.3 Stormwater Management (Incorporating Catchment & River Management)

The various water related services such as water supply, sanitation and stormwater management are inextricably linked and greater emphasis will be placed within the foreseeable future in optimising and managing their interactions in keeping with the principles of Integrated Water Resource Management. These interactions include direct connectivity between systems in the case of sewer overflows, effluent discharges to watercourses forming the bulk drainage system and abstraction of water from surface and sub-surface resources within the metropolitan area. Whilst the Stormwater Management service currently falls within the Transport, Roads and Stormwater Department of the City of Cape Town, concerted efforts are being made to ensure close co-operation of Water Services for the benefit of the city's residents and visitors.

Over the past few decades rivers have been viewed as convenient drains to convey urban waste and storm runoff. They were canalised on a large scale and many wetland areas in-filled and drained to allow for urban development, dramatically altering the natural hydrological cycle. In retrospect, this approach has inadvertently also precipitated a decline in water quality and ecological integrity of the city's rivers and vleis.

A paradigm shift in approach to stormwater management in Cape Town has developed over the past few years, based on the philosophy of integrated catchment management. Within the metropolitan area, this was pioneered by the former Cape Metropolitan Council. A Catchment Management Department (CMD) established in 1996 was tasked with promoting 'best practice' in the management of urban rivers, wetlands, vleis and major stormwater infrastructure in partnership with the previous metropolitan local councils.
The following stormwater management principles are now widely recognised and rapidly gaining acceptance:

- The need to adopt an integrated and co-ordinated approach, based on a good understanding of local needs / values, statutory requirements and practical / financial constraints.
- The need to minimise the impacts of flooding with an emphasis placed on reducing peak flows at source either through flood attenuation ponds or infiltration.
- Protection of urban water resources; including rivers, wetlands, vleis, subsurface and coastal waters from the potentially harmful impacts of polluted runoff or altered hydrological response.
- Involvement of communities and other stakeholders in the management of river systems through catchment forums.

The stormwater service involves the management of urban catchment areas in respect of their hydrological functioning for drainage, flood control, ecological and social needs and as an important urban water resource. It includes the management of reticulation systems, open watercourses, wetlands, groundwater, vleis and estuaries, and engagement with communities living within the various catchment areas. The major river systems and associated catchment areas within the metropolitan area are illustrated by Figure 6.1.

The stormwater network comprises approximately:

- 1200 km of rivers and streams
- 200 km of lined canals
- 5000 km of underground pipes and culverts
- 300 stormwater detention ponds
- 10 automatic pumping stations

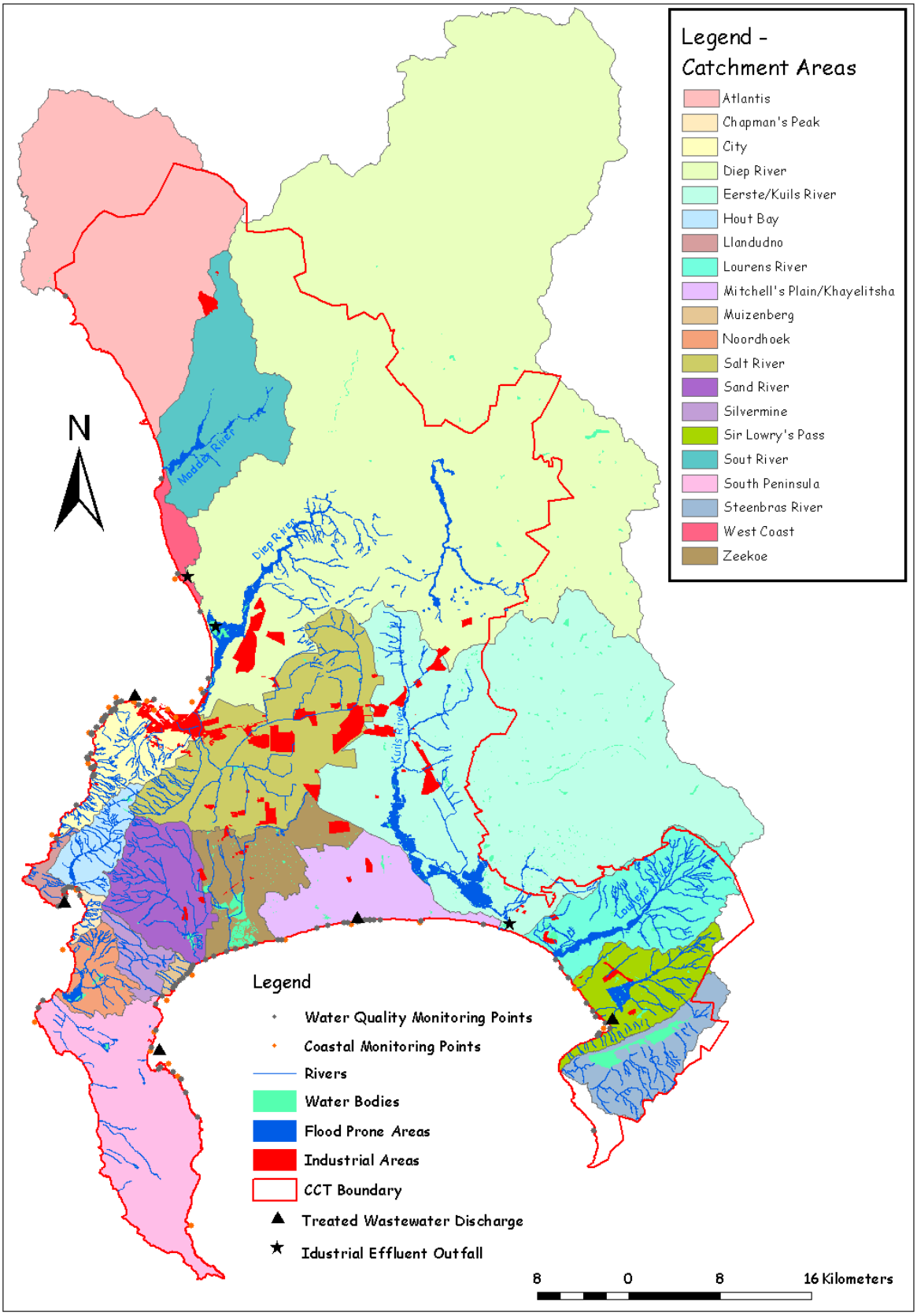
Functional areas within the service include:

- Strategy and policy development
- Planning, development control and project management
- System upgrading and development
- Asset management (reticulation, watercourse maintenance, pollution control etc)

- River flow, rainfall and water quality monitoring rivers, vleis and coastal waters).
- Education and capacity building

The 2001 / 2002 capital and operating budgets for the service totalled R66.5m and R87.3m respectively.

Figure 6.1 Major Stormwater Catchment Areas and Monitoring Points



Due to the all-encompassing spatial nature of drainage catchments and the water related bias of this service, it is inextricably linked to various other functions and bodies within Council and outside, from both planning and operational viewpoints, including but not limited to:

- Transport and Roads
- Water and Sanitation Services
- Waste Management
- Community Services
- Planning & Environment
- Housing

There is a growing movement at local, regional and national level to ensure improved and integrated management of urban stormwater systems in a manner that balances competing and often divergent needs of the community, such as:

- Flood protection
- Ecological enhancement and protection of aquatic systems
- Cultural, recreational and economic opportunities

In an effort to rise to these challenges, a detailed strategy comprising various priority programmes to be implemented over the next five years has recently been formulated. A draft copy is attached **GO TO**. This strategy provides a comprehensive framework to guide management of stormwater systems for the sustained benefit of the city's residents, business concerns and visitors alike.

Underpinning the strategy are the following guiding principles:

- Customer Focus
- Holistic Planning & Management
- Duty of Care
- Sustainability
- Management Excellence
- Co-operative governance
- Participation and Partnership
- Transparency

The guiding vision and mission of the service are as follows:

Vision: Effective Stormwater Management with Safe and Healthy Rivers

Mission: Minimise flooding of property and improving and maintaining the health of our rivers, wetlands and vleis through integrated catchment management for the benefit of the people of the CCT.

Various priority programmes comprising the strategy have been grouped under themes as follows:

Integrated Planning:

- Preparation of Catchment and River Management Plans (CRMP)
- Preparation of Stormwater Master Plans (SMP)
- Preparation of Local Stormwater Management Plans (LSMP)
- Formulation of Stormwater Management Guidelines and Design Criteria for New Developments
- Promotion of Integrated Urban Water Resource Management

System Upgrading and Development:

- Formulation of a Risk Based Approach to System Upgrading
- Flood Disaster Management Programme
- Provision of Stormwater Services to Informal Areas

Asset Management:

- Investigation into System of Charges and Levies
- Guidelines for Environmentally Sensitive River Maintenance
- Development of Management Information Systems and Data Bureau Services
- Development of an Integrated Asset Management System

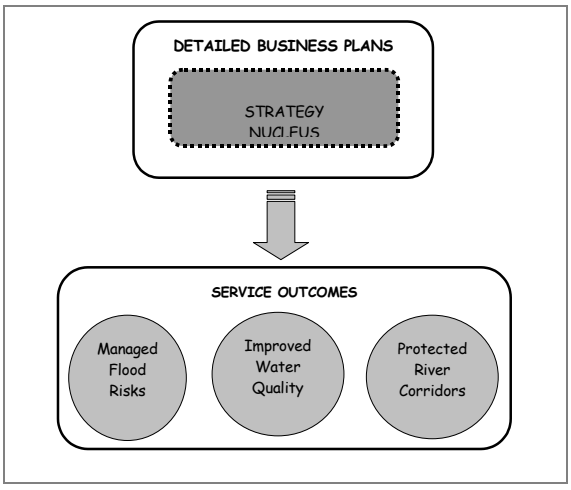
Regulation

- Development of Policy for Development near Watercourses
- Promulgation of Stormwater Management By-Laws

Relationship Management

- Customer Care Programme
- Staff Development Programmes
- General Education Programmes
- Partnership Development Programmes
- Provision of Consultancy Services

The strategy will also form the nucleus of detailed business plans prepared for the service over the next few years as illustrated below.



The following mechanisms will be utilised to monitor and report on the impact of the strategy. This overall approach, philosophy and management principles will be reviewed and amended as required every 5 years:

- Annual reporting on key indicators as outlined in Table 6.1.
- Biennial review of progress in implementing the various programmes.

For further information on the stormwater management service, refer to the website of the CMD at www.cmc.gov.za/w&w/CatchmentMgmt.

Information of flood prone areas as well as associated draft development control guidelines are published at www.capetown.gov.za under the following icons:


Table 6.1: Performance indicators and tragets

Outcomes	**Targets**		
Managed Flood Risks	Less than 5 multiple property flooding incidents per year (provided rainfall is within 10 yearly maximum severity)		
Improved Water Quality	Location	Percentage Compliance with Accepted Targets	
		Public Health	Aquatic System
	Rivers	Under development	Under Development
	Vleis	Under development	Under development
	Beaches: False Bay	90%	N/A
	Beaches: Atlantic	75%	N/A

6.4 Related Acts

6.4.1 The Occupational Health and Safety Act

All sections of the Bulk Water Department abide by the Occupational Health and Safety Act 85 of 1993. All designations in terms of responsibility are made in accordance with the OHS Act. It is every employee's responsibility to abide by the Act. Every section, in the department, is encouraged to adopt the NOSA MBO (management by objective) system. Some sections have done so with distinction and have been awarded the NOSA 5 star grading. A recent addition to the NOSA audit is environmental considerations. This requires all infrastructures audited to have an environmental audit and risk management system in place. To achieve this goal, the Bulk Water Department appointed Ecobe EMS to conduct the environmental audit.

The implementation of the audit programme will assist in identifying non-compliance, risk and best practice environmental issues and enable these to be prioritised and addressed on an annual basis by the Bulk Water Department. This will not only enable compliance with South African environmental legislation and NOSA's environmental requirements, but also ensure that environmental benefits are maximised and risk to employees, surrounding communities and the natural environment are reduced and cost savings achieved. It is imperative that such a protocol takes account of all relevant legislation and related environmental requirements. In this regard, as most of CMC Water's infrastructure in the peninsula area falls within or adjacent to the Cape Peninsula National Park (CPNP), the protocol must comply with the requirements of the Infrastructure Management Plan of the CPNP.

Section 7 of the Act covers the Environmental Regulations for Workplace. It is the responsibility of each manager to minimise/eliminate pollution and to ensure good environmental conditions for employees. Water treatment plants do no pose too much of a threat to the environmental. Sludge, the by-product of the treatment process is harmless and is disposed of in landfill sites. There is little chance of air pollution with regards to hazardous chemicals as the water treatment plants have been designed to contain spillages and minimise releases.

6.4.2 National Water Act

The CCT has registered its bulk water use in terms of Section 4 (Use of Water) of the National Water Act (1998). The registration application includes the registration of bulk water supplied to consumers outside the Cape Metropolitan Area.

The Cape Metropolitan Area falls within the Berg River Water Management Area. Approximately half of the CCT's raw water supply requirements originates from water sources within an adjacent Water Management Area (i.e. the Breede River Water Management Area). It is important that the CCT is represented on both these Catchment Management Agencies when they are created in terms of the National Water Act.

6.4.3 Water Services Act

In terms of the Water Services Act, every Water Services Authority has to:

- promulgate Water Bylaws, which set out conditions for the provision of water services. There is a need to draft consolidated Water Bylaws for the CCT as discussed in section 3.5.
- draft a Water Demand Management Strategy and Policy. CCT complies with this requirement, i.e. a Water Demand Strategy **GO TO** and Policy **GO TO** has been accepted as discussed in Section 4.3.