

CHAPTER ONE : INTRODUCTION

1.1 What is a Catchment Management Strategy ?

The National Water Act (Act No 36 of 1998)(NWA) does not define Catchment Management Strategy (CMS) *per se*, but refers to why it is required and what it should contain. It would therefore be instructive to first define Catchment Management Strategy in general terms, in order to put the subject matter into context.

Catchment: In a geographic context, a catchment is the area from which any rainfall will drain into the watercourse(s) or part of a watercourse, through surface flow to a common point or points. In the context of the NWA, the CMS is intended for a catchment of specific nature and size, namely that of a Water Management Area (WMA), as established by the National Water Resources Strategy (NWRS). In this document, the word “catchment” in Catchment Management Strategy therefore always refers to Water Management Area.

Management: is derived from the Latin word “manus” which means “hand”; to manage means to handle, hence management denotes handling of affairs of any particular nature. Handling is made up of a series of activities which include administration, supervision, guidance, regulation, organisation, negotiation, control, overseeing and so on.

Strategy: is derived from the Greek words “stratos” which is army, and “aegin” which means to lead. Strategy literally means a piece of generalship (as in leading an army). More generally, a strategy is an overall plan or campaign to achieve a specific objective, such as to win a battle or war.

A Catchment Management Strategy may therefore be viewed as an overall plan or campaign to handle the affairs of a WMA to achieve specific objectives. Since a campaign is an organised course of action, the word strategy could also be regarded as being a “process”. Taken a step further, a strategy can be regarded as a process of using human, financial and water resources to achieve specific objectives in the most efficient and productive way.

1.2 Why do we need a strategy for managing water resources ?

The world’s freshwater resources are under pressure to meet the growing demands of burgeoning populations and their various activities. This problem is repeatedly acknowledged at international forums such as the 1992 Rio Summit. The fact that South Africa receives less than the world’s average annual rainfall suggests that it is a potential candidate for water stress. What is needed though is a clearly articulated and widely accepted problem statement to establish a common understanding of why a revised attempt to manage water resources is warranted. A common vision can then be formulated to direct future efforts in water resource management, from which goals and objectives can evolve.

In South Africa, the problem statement can be regarded as twofold

- The Water Act of 1956 did not reflect fairness, equity or an orchestrated attempt to recognise and respond appropriately to the country's limited water resources.
- If the current level and rate of water usage is maintained, serious water shortages are anticipated by 2030 or even sooner

In response to these and other concerns, South African water policy has been totally revised in the context of the following main issues:

- That we should try to achieve a sustainable balance between utilisation and protection of our water
- The interlinkages between water, land-use, the environment and human activities
- It is essential to develop partnerships/institutions for participative management between stakeholders, communities and organs of state

1.3 What are the objectives of a catchment management strategy?

The underlying purpose of a CMS is to facilitate water management at WMA level. The main objective of a CMS is to facilitate the management of the water resources environment and influence human behaviour in ways that would achieve equitable, efficient and sustainable use of water for the benefit of all users.

A CMS is not a once-off plan for managing water resources in a catchment but rather a phased implementation of a dynamic, participative, integrated **process** that must be regularly reviewed (at least once every 5 years). The **process** consists broadly of the following steps: data collection, investigation, information assimilation, planning, implementation, monitoring and control, auditing and review. These components need to be integrated and implemented through an institutional framework that is yet to be developed. The components generally contain "action items", which are designed towards implementing the objectives of the strategy, and to explain who is going to do what, where and when, as well as why and how. The purpose of this document is to focus on the generic **framework** for CMS; further details on that cover the what, why, how, etc of implementing the CMS will be covered at a later stage.

Developing a CMS means making sound decisions about managing the catchment. To reach sound decisions, one needs to analyse all the relevant facts. An analysis of strengths, weaknesses, opportunities and threats (SWOT) is a widely used management technique, is relatively simple and could be very useful for strategic decision making. In the case of a CMS, the analysis of external factors, such as opportunities and threats in a catchment, and strengths and weaknesses of the CMA and DWAF can produce realistic issues that need to be considered in a strategy.

1.4 New policy and legislation for water resource management

A few years ago, the Department of Water Affairs and Forestry (DWAF) developed a national vision for water, namely "some, for all, for ever", which in its full context

implies

- Access to a limited resource (some)
- On an equitable basis (for all)
- In a sustainable manner, now and in the future (for ever).

Subsequently, the word “together” was added to signify that this will be achieved in consultation with stakeholders. More recently, the expression “viva water, pure and clean, viva forests rich and green” has emerged as part of DWAF’s vision for South Africa.

To achieve this vision, the purpose or goals of the NWA are:

- to ensure that the country’s water resources are protected, used, developed, conserved, managed and controlled in ways which take into account numerous factors, such as meeting basic human needs, promoting equitable access, redressing the results of past discrimination, etc, and
- to establish suitable institutions with appropriate community, racial and gender representation to achieve the first purpose.

The NWA sets the framework for the development of water management strategies. The goals of the National and Catchment strategies are a logical extension of the goals of the NWA, as they are intended to give effect to the main purpose of the Act.

According to the NWA, a CMS should facilitate the management of the water resources within a WMA by

- taking account of a variety of local conditions,
- taking account of the needs and expectations of water users,
- enabling public participation in water resource management,
- taking account of the Reserve, classification, etc
- preparing a water use allocation plan

in a manner which harmonises with the philosophy and aims of the NWRS in order to attain a balance between protection and use of water resources. It will be the responsibility of a Catchment Management Agency (CMA) or DWAF to develop a CMS for the water resources within its WMA. It is also the responsibility of the CMA/Minister to give effect to the CMS once it is established.

CHAPTER 2. BOUNDARY CONDITIONS FOR THE CMS

The main objective of a CMS is to facilitate the management of the water resources environment and human behaviour in ways that achieve equitable, efficient and sustainable use of water for the benefit of all users.

The main focus of this chapter is to highlight issues related to legislation and water resource management that impact on the development of a CMS. The framework for a CMS, which constitutes the main part of the document is developed in the next chapter and summarised in the form of headings and sub-headings in Appendix A.

As the trustee of the nation's water resources, DWAF needs to consider matters of national interest and co-ordinate the management of water resources in 19 different WMAs. As far as catchment management strategies are concerned, this document will provide a template for all WMAs thereby ensuring consistency of approach.

In the development of a CMS, numerous other initiatives related to the National Water Act, Water Services Act, National Forests Act No 84 of 1998, National Veld Forest Fire Act No 101 of 1998 are relevant in that they are either informative, or form part of the requirements of, or challenges to, the development of a CMS. The most important initiatives and their connection with CMS are grouped below under four main headings:

2.1 National Water Act (36 of 1998)	Water Management Areas, Legislative procedure, National Water Resources Strategy, Section 9 of NWA, Water Allocation principles, Pricing strategy, Licence applications, Guidelines, Water Balance and Situation Assessments, Registration, Water Quality Management
2.2 Water Services Act	Water Services Development Plans
2.3 Other Acts	Integrated Development Plans, other plans
2.4 Other related issues	Strategic Environmental Assessment

The discussion that follows summarises what each issue entails and its immediate relevance to CMS. Some of the issues have timing or other implications that may present difficulties or delays to the preparation of a CMS; some of these aspects are discussed in Appendix B: Limiting Conditions for CMS development. It must be borne in mind that the number and nature of the limiting conditions change with time, and may not be applicable at a later stage. For this reason they appear in an Appendix so that updates can be made at appropriate intervals without detracting from the main text of this document.

2.1 Issues related to the National Water Act

2.1.1 The location and boundaries of **Water Management Areas** (WMA) as declared by the NWRS is the area of jurisdiction for the CMS. The layout and establishment of WMAs prepares the ground for focussing future efforts in the preparation of CMSs.

2.1.2 The **legislative procedure** for establishing, advertising, obtaining Ministerial consent and gazetting a CMS will be according to sections 8(1), (2), (4) and (5) of the NWA respectively. A CMS first needs to be developed through wide consultation and with reference to the Minister for policy issues. It must then be published for inspection and comment from stakeholders. After the comments are taken into consideration, the CMS must be submitted to the Minister for approval before it can be published in the Gazette as an established CMS.

2.1.3 The **National Water Resources Strategy (NWRS)** will provide the framework for managing water resources at a regional scale. Within this framework, the CMS must provide the necessary strategies, plans and methodologies for managing water resources, which must therefore not be in conflict with the NWRS.

The Reserve determination, resource classification and determination of resource quality objectives will be based on the procedures and approaches initiated by the Chief Directorate: Scientific Services. These parameters need to be determined before any additional water can be allocated in a stressed catchment. The actual determination of these parameters is a time consuming exercise and still needs to be completed for each WMA.

2.1.4 **Section 9 ((a) to (i)) of the National Water Act** specifies elements that must be contained in a CMS; these may be regarded as the minimum requirements for a CMS as far as the Act is concerned. All of the items in section 9 have been taken into account in this document; comments on each item in section 9 are discussed in the Appendix.-----

2.1.5 In developing a water allocation plan, a CMS must set **principles for allocating water** to existing and prospective users, taking into account the factors mentioned in section 27(1) of the Act. Briefly, these factors are:

- Existing lawful uses
- Redressing the results of past discrimination
- Efficient and beneficial use in the public interest
- Socio-economic impact of authorising use(s)
- The likely effect of the use on the resource and other users
- The class and resource quality objectives of the resource
- Investments made and to be made by the user in respect of the use
- The strategic importance of the use to be authorised
- The resource water quality required for the Reserve and international obligations
- The probable duration of any undertaking for which the use is to be authorised

A comprehensive allocation plan is required for water allocation in a WMA. The NWRS will provide an “allocatable volume” for the WMA by taking account of the Reserve, international obligations, interbasin transfers, national strategic uses and possibly a contingency amount from the total water that is available in each WMA; the balance is then available for allocation. Allocation is used here in the general sense, and in terms of the Act consisting includes of the following categories:

- Existing lawful use
- Section 33 cases (declaration of water use as existing lawful use)
- Water used under Schedule 1 uses
- Water used under General authorisations
- New water uses

Collectively, the above allocations should not exceed the allocatable volume, nor does the WMA have to use up all its allocatable volume. The strategy should take a balanced view of all relevant considerations in preparing an allocation plan, for example, the ability of a resource to assimilate waste will have to be taken into account when allocation volumes are determined.

Two diagrams (Figures 1 and 2) illustrating how the Section 27(1) factors and licensing decisions relate to the NWRS and the CMS have been included in the Appendix..... The diagrams have been taken from the DWAF “Guideline for Assessment of water use authorisations and licence applications in terms of the National Water Act, 1998” (Rev 9, Oct 99)

2.1.6 The proposed **pricing strategy** for raw water use (in terms of section 56(1)) of the NWA prepared by DWAF will serve as the basis for pricing raw water use in all WMAs. The relevance of the pricing strategy for “first tier water” includes the following issues

- the starting point for the pricing strategy is the WMA
- there are certain claims to water that are exempt from pricing, for example, Schedule 1 uses, basic human needs, ecological reserve, and international obligations.
- Funding obtained from water use charges also contributes to water resource management activities, such as planning and implementing a CMS

Besides raw water, the pricing strategy will, at some time in the future, also cover a charge system for waste discharges.

2.1.7 The procedure and conditions that apply to **licence applications**, review, amendment and substitution of conditions will follow Parts 7, 8 and 9 of the NWA. The DWAF document “Guidelines for the assessment of water use authorisations and licence applications”, (Rev 13, 10 Feb 2000) focuses on the considerations listed in section 27(1) of the NWA. Apart from preferential allocations, the document also discusses the issue of “existing lawful use” in considerable detail, outlining the various cases that qualify. Figure 3 in the Appendix illustrates the relationship between water use and licensing.

2.1.8 A series of **guidelines** have already been produced by the DWAF dealing specifically with catchment management as well as related issues. Of immediate relevance to CMS are the following:

- Guide 1: Establishing a Catchment Management Agency
- Guide 2: The Catchment Management Agency as an Organisation
- Guide 3: Establishing a Water User Association
- Guide 4: Public participation for CMAs and WUAs

Framework for Catchment Management Policy (all of the above from Directorate : Catchment Management)
Water Resources Protection Policy Implementation (RDM office)
Water Conservation and Demand Management Strategies per sector: Agriculture, Forestry, Water Services, Industry, Mining and Power Generation (Directorate : Water Conservation)
Guideline for Catchment Management Strategies for Water Quality (Directorate: Water Quality Management)

2.1.9 The **water situation assessment studies model** data determined by the NWRS will serve as the starting point for all WMAs. The DWAF Directorate: Water Resources Planning will produce a database of relevant characteristics of all quaternary catchments in South Africa. All the key data will be stored in the computer based model, which will not only provide overall water availability for each quaternary catchment, but will enable CMAs to predict the impact of future water planning scenarios on water users and water availability.

2.1.10 In October 1999, DWAF initiated a **registration** process whereby it is hoped that all users who do not receive water from a local authority, water board, irrigation board or other bulk supplier, will identify themselves, their locality and register the amount they are using and for what purpose. Besides building an overall picture of water use in the country, the outcome of this process will facilitate better protection and management of resources, ensure fair allocation, and enable the pricing strategy to be implemented.

It is essential that a CMA be fully aware of any significant water usage that has either not been captured through registration or general authorisation processes, or is planned for as part of some future development so that it can manage its resources properly.

2.1.11 Several initiatives are being undertaken by the Directorate: **Water Quality Management** in response to the NWA that are relevant to the development of water quality aspects of CMS and/or catchment management plans. Some of the key initiatives are:

Guidelines for the WQM components of a CMS
Procedure for Water Quality Catchment Assessment Studies
National WQM Framework Policy
Guidelines for the establishment and management of catchment management fora

2.2 Issues related to the Water Services Act (No 108 of 1997)

2.2.1 The Water Services Act (Act 108 of 1997) requires that every water services authority (WSA) prepares a five year **water services development plan** (WSDP) as part of its Integrated Development Plan (IDP). The IDP is legislated by the Municipal Systems Bill. A WSDP is a sectoral plan that deals with socio-economic, technical, financial, organisational and environmental issues as they pertain to water services. The main aims of WSDPs is to make WSAs accountable to consumers, to facilitate proper

planning of efficient and sustainable water services, to allow for regulation at local and national level and to provide information at national level relating to water services and water resources. The relationship between the WSDP and the CMS is depicted in Figure 4 (Appendix) which is based on the fact that Local Authorities/Water Service Providers need to comply with the CMS.

The Water Services Act deals with the limitations on the amount of water that may be abstracted from a resource, water quality of return flows, demand management and protection of water resources, all of which impacts on WSDPs. It also requires that applications for licences must be made for new water allocations, including new allocations required by Water Services Institutions. WSDPs therefore form an integral link between the Water Services Act and the NWA. The NWA also controls effluent discharge, including those from sewage works. This aspect should be covered in WSDPs, as should the efficiency of water use.

2.3 Issues related to other Acts

2.3.1 Integrated Development Plans (IDPs), legislated by the Municipal Systems Bill, form the process through which municipalities establish short, medium and long term development plans, taking all sectors into account, of which WSDPs form a part. District municipalities need to co-ordinate and integrate the IDPs (and hence the WSDPs) of local municipalities in order to produce a framework for plans within their area of jurisdiction. Amongst the aims of this exercise is to achieve regional efficiency and benefit of scale.

Other plans

- Water User Association management plans
- Land Development Objectives (LDO) prepared by local authorities under the Development Facilitation Act
- Regional planning processes such as Spatial Development Initiatives (SDI) and Economic Development Strategies.
- Environmental Management Plans prepared in terms of the National Environment Management Act
- Environmental Implementation Plans
- Forestry Action Plans

2.4 Other related issues

2.4.1 The Strategic Environmental Assessment (SEA) implemented by DWAF is a useful decision support tool for water resource management as part of the Integrated Environmental Management process. SEA looks at the whole environment (physical, social and economic), and reviews how that environment can support development in a sustainable way. SEAs should preferably be undertaken in a phased manner, starting with catchments that require the most attention (either through water stress or other related conditions) to those under less stress, as resources permit.

CHAPTER 3. DEVELOPING A GENERIC FRAMEWORK FOR CMS

3.1 Introduction

The purpose of this chapter is to present the structure and content of a CMS that fulfils the requirements of integrated water resources management, and meets the requirements of section 9 of the NWA.

The National policy for water resource management is based on finding a balance between protection and utilisation, and in doing so, managing water in a way that is economically efficient, ecologically sustainable and socially equitable. Towards this end, the NWRS will provide the framework for managing water resources for the country as a whole. Within this framework, a CMS must provide the necessary strategies, objectives, plans, guidelines and procedures for managing the water resources in a WMA. The National Water Act requires that a CMS be prepared by the CMA. Given the realities however, of resource, time and other limitations, the appropriate Regional Office of DWAF or DWAF as a whole will develop the CMS where a CMA does not already exist, with the CMA taking over the responsibilities when it is established. Legally, where no CMA exists, DWAF (Regional Office) is the CMA. In this respect, where “CMA” appears in this document, it should be read as “CMA or Regional Office of DWAF”.

CMS (as required by the NWA) is an entirely new concept for South Africa, whereby water resources will be managed in a decentralised manner in the 19 Water Management Areas. The CMS is a document that will direct the manner in which a CMA will manage the water resources within its WMA.

Before we describe the CMS itself, however, there are some important issues that need to be considered:

Firstly, the question of **catchment scale**.

The WMA sizes that were selected were based on considerations that were not linked exclusively to regional water resource management. Typical criteria used for the determination of WMAs include

- The potential for financial viability of the CMA, and
- Availability of expertise and experience for various facets of water resource management.

The scale at which most of the data for the Reserve, water availability, water demands, water quality (limited), transfers, international obligations, and projected demands is likely to be quoted (ie quaternary) is much smaller than the average WMA catchment size. It would be inappropriate and inaccurate to simply extrapolate the water related problems that occur at quaternary or smaller scale (and the strategies to deal with them) to a WMA scale. This could tend to overstate the extent of stress in the WMA and burden the area with unnecessary costs, or in some cases not necessarily address all the relevant problems or concerns of the WMA.

Secondly, the question of **novelty**.

Both the CMA and CMS are new entities created by the NWA. A CMS must apply to a WMA which is generally of a large geographic scale. However, addressing problems at a smaller scale through catchment studies and other initiatives is a common and effective practice and will continue to serve its role for localised issues. However, to succeed as a functional unit, a CMA needs to co-ordinate such isolated efforts, identify and address problems where sufficient resources were not readily available, and consider issues of regional importance, amongst numerous other things.

3.2 What is the procedure for developing a CMS?

As one of its initial functions, a CMA must first develop a CMS and then establish it (or part(s) of it) by notice in the Government Gazette. The CMA then needs to give effect to the CMS.

3.2.1 Developing a CMS

With regard to **developing** a CMS, there are three main requirements in the NWA:

(i) In developing a CMS, the CMA must consult with

- The Minister (through DWAF),
- Any organ of state which has an interest in the content, effect, or implementation of the CMS, and
- Any persons/organisations whose activities may affect water resources in the WMA, or who have an interest in the content, effect or implementation of the CMS

(ii) The CMA must refer to the Minister any part of the CMS that raises a material question of every/any policy that DWAF has or will produce, or raises a question of the relationship between DWAF and other organs of state, or other organs of state and their respective roles in developing or implementing a CMS

(iii) The Minister may establish guidelines for the preparation of CMSs, towards which this document is aimed.

3.2.2. Establishing a CMS

Before **establishing** a CMS or part of a CMS, the CMA must do three things:

(i) Publish a notice in the Gazette that summarises the CMS, states where it can be inspected, and invites written comments on the CMS by a specified date.

(ii) Consider and take any further steps if appropriate, to bring the notice to the attention of interested persons.

(iii) Consider all comments received by the specified date.

The CMS must **then** be submitted to the Minister (through DWAF) for written consent before being formally **established**. It is then published as a notice in the Government Gazette, together with an address where it may be inspected.

3.2.3 Progressive development of CMS

The CMS may be established in a phased and progressive manner, and in separate components over time. However, the initial submission of the CMS must contain at least a programme of what the CMA intends to do in developing the CMS, using the template provided in this document as a basis to work from. It must also show the prioritisation of proposed activities for developing the CMS, identify the gaps, and include a proposed time table of activities. The Directorate: Catchment Management will receive submissions on behalf of the Minister, and the evaluation thereof will be based on the Protocol that appears in the Appendix-----

The CMS must also be reviewed at intervals of not more than 5 years. In general terms, a review will examine whether the strategy (where it exists as a whole) or components of the strategy are still relevant, with revisions or corrective actions taken where appropriate. Where necessary, changes to a strategy can also be made before 5 years have elapsed.

3.3 What does the CMS consist of?

To manage water resources in a large area effectively, it is essential to have at least the following

- Appropriate and adequate information about the characteristics of the WMA
- Appropriate strategies, objectives, plans, guidelines and procedures
- Adequate human and financial resources
- Sufficient involvement and support of stakeholders

In the light of the above, it is proposed that a CMS consist of three components:

1. **Situation Assessment** to establish the characteristics of the WMA, covering demographics, a profile of water resources, physical characteristics, hydrological and hydro-geological characteristics, vegetation and land use profile, water use profile and economic overview. The Situation Assessment is generally done at catchment level, and then combined to describe the WMA as a whole.
2. **Foundation strategies** that provide the over arching framework for managing water resources in the WMA but do not deal with specific aspects of water resource management. These strategies create the framework for human and financial resources and the institutional development necessary to involve and deal with stakeholders as well as to implement the strategies. This is why the term “foundation” has been used because these strategies provide the enabling framework (ie a basis to work from) to get from the situation assessment (“where we are now”) to the water

management strategies (“where we would like to be”).

3. **Supporting strategies** to protect, use, develop, conserve, manage and control water resources. These strategies are viewed as the minimum requirements for covering as many aspects as possible of water resource management of the WMA.

Integration of Strategies. The Foundation and Supporting strategies are not totally independent of each other, but have been separated for convenience to provide some structure and facilitate the compilation of the CMS in appropriate components. The linkages between the strategies must be outlined to integrate and streamline the various management initiatives.

Figure 7 in the appendix schematically illustrates the above arrangement.

Every CMS will therefore have the same basic format, with differences in the level of detail with regard to the baseline and water management strategies. Each of the three components of a CMS will now be discussed in more detail.

3.3.1 SITUATION ASSESSMENT

Reason for Situation Assessment

The main reason for the Situation Assessment is that in order to manage water resources on a regional scale, it is essential to have adequate and relevant information. The CMA should undertake a data collection exercise for this purpose.

Water Resources Situation Assessment Studies

- The DWAF Water Resources Situation Assessment studies (WRSAS) will produce a database of relevant characteristics of all quaternary catchments in South Africa. Given that there are 1946 quaternary catchments in South Africa and only 19 Water Management Areas, the WRSAS database will provide a wealth of data at a reasonably high resolution for the purposes of a WMA. A standard database format will be used by all WMAs, which facilitates easier co-ordination by DWAF at a national scale, while providing a convenient template (in electronic format) for each WMA to use and update the WRSAS data. An initial appreciation of stressed catchments can be derived by an analysis of the water quantity, quality and ecological appraisal data that covers the entire country. A discussion of the evaluation of stress with respect to water quantity, quality and ecology appears in the Appendix-----
- Water usage by all sectors is going to be recorded for all quaternaries throughout the country. These figures are likely to be used to determine how much water is available for allocation in each catchment by subtracting the total usage or demand from total available yield.
- The WRSAS data has certain limitations regarding chronology, accuracy and resolution; and in this respect comprises the minimum requirement for the WMA

situation assessment. The CMA should supplement or update the WRSAS information with more accurate data or local knowledge, thereby adding value to the database. In some cases, more comprehensive “catchment studies” exist that may contain data that supplements or covers more detail than the WRSAS. For the larger river systems, detailed “Systems Analysis” have also been undertaken. Additionally, investigations or situation assessment studies undertaken by other Government departments could add value to the assessment and management of water resources; such studies should be sourced by the CMA through its co-operative governance strategy.

Strategic Environmental Assessment

The Strategic Environmental Assessments (SEA) is a useful decision support tool in that it involves stakeholder participation and provides appropriate information for planning and decision making, and should be a part of the situation assessment. It can provide a basis to work from in preparing foundation and supporting strategies. Unless the feasibility of an SEA exercise for the entire WMA can be motivated, SEAs should be undertaken in a phased manner, starting with catchments that require the most attention (either through water stress or other related conditions) and progressing to those under less stress, as resources permit.

Key issues to be addressed by Situation Assessment

Over and above the information obtained from the WRSAS and SEA study, the following key issues must be addressed by the situation assessment :

- the status of existing institutional arrangements (with reference to water boards, irrigation boards, DWAF regional office etc)
- reserve and resource quality objectives – are requirements being satisfied?
- Current classification of water resources
- The status of abstraction control – is access to the resource well managed, or are upstream users regularly abstracting more than their quota to the detriment of downstream users?
- The status of water demand management – is water being used ineffectively and uneconomically?
- Status of water quality – are spills regularly reported or detected? Is water quality in the catchment deteriorating? Is water fit for use on a sustainable basis?
- The amount of current and future investment in water resources infrastructure and catchment management activities
- Status of water resource related cost recovery (tariff collection, self sufficiency)
- Significant historic events or activities of relevance to water resource management such as floods, droughts, or change in status or role of key role players.

3.3.2 FOUNDATION STRATEGIES

The foundation strategies are of great importance because they provide the structure and enabling framework within which the water management strategies can be implemented. The strategies are inherently interrelated in that collectively they form part of the overall CMS for the WMA, but are separated for ease of preparation and development. The foundation strategies that each WMA must have are summarised below.

3.3.2.1 RDM strategy:

Purpose	To develop strategies for management classes and resource quality objectives
Content	Database of and strategies for resource classification and RQOs of all resources

3.3.2.2 NWRS strategy

Purpose	To meet the requirements of the NWRS
Content	Strategies to meet requirements of Reserve, water availability (allocatable portion), water balance, transfers, international obligations and strategic uses

3.3.2.3 Stressed catchments strategy:

Purpose	To develop strategies for stressed and unstressed catchments
Content	<ul style="list-style-type: none">• Identify and prioritise stressed catchments in WMA• Develop strategy for catchment management plans (stressed and unstressed catchments)• Develop strategy for more detailed catchment assessments

3.3.2.4 Institutional development strategy:

Purpose	To deal with existing and develop new institutional framework
Content	<ul style="list-style-type: none">• Evaluate existing institutions• Strategise for new institutional structure• Clarify roles and relationships between institutions• Establish communication mechanisms• Prioritise activities for institutional development strategy

3.3.2.5 Spatial/landuse planning strategy:

Purpose	To influence water related aspects of landuse planning
Content	<ul style="list-style-type: none">• Identify existing landuse and mix of political/catchment boundaries

	<ul style="list-style-type: none"> • Spatial compatibility between development and water locality • Liaise/interact with landuse planning institutions to influence water related aspects of planning • Identify and integrate development initiatives with CMS
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3.3.2.6 Human Resource strategy:

Purpose	To establish policy on human resource requirements and development
Content	<ul style="list-style-type: none"> • Establish management philosophy (“lean’ versus “fully fledged”) • Develop policy on human resource requirements and development • Identify management roles and responsibilities

3.3.2.7 Co-operative governance strategy:

Purpose	To strategise for effective co-operative governance
Content	<ul style="list-style-type: none"> • Identify “Government” role players in catchment management • Develop communication strategy for joint planning

3.3.2.8 Public involvement / interaction strategy:

Purpose	<p>To optimise the process of reaching stakeholders for their meaningful participation</p> <p>To facilitate effective public participation in the development and implementation of the CMS</p>
Content	<ul style="list-style-type: none"> • Identify all stakeholders • Develop information dissemination strategies aimed at meaningful participation • Develop mechanisms for interaction with stakeholders • Refer to Public Participation guidelines produced by Directorate: Catchment Management

3.3.2.9 Data collection and information management strategy:

Purpose	To develop centralised, relevant, and updated database for planning and strategy formulation
Content	<ul style="list-style-type: none"> • Develop/acquire appropriate hardware and software to support databases, GIS, information management, monitoring, reporting • Develop strategy to organise and regularly update WRSAS database, and characteristics of additional data to be collected (sources, scale, accuracy) • Develop strategies for making data accessible to stakeholders and DWAF

3.3.2.10 Capacity building/education strategy:

Purpose	To improve the level of participation through appropriate capacity building
Content	<ul style="list-style-type: none">• Develop profile of existing capacity and community involvement• Develop strategies for adding to existing and building new capacity• Investigate education and training programmes at various levels

3.3.2.11 Auditing and review strategy:

Purpose	To strategise for internal and external auditing of CMS activities
Content	<ul style="list-style-type: none">• Identify CMS aspects to be audited• Identify audit standards, frequency, type of reporting and feedback, corrective action

3.3.2.12 Conflict management strategy:

Purpose	To strategise for conflict anticipation and resolution
Content	<ul style="list-style-type: none">• Appoint advisory committee to identify potential dispute issues and advise on legal matters• Develop dispute resolution strategy in relation to role of Water Tribunal

3.3.2.13 Financial strategy:

Purpose	To develop a strategy to ensure financial viability and growth
Content	<ul style="list-style-type: none">• Prepare overall annual business plan• Investigate income potential and likely expenditure (per annum)• Strategise for financial growth

3.3.3 SUPPORTING STRATEGIES

These strategies are deemed to be essential for all WMAs in order to effectively manage water resources in their regions. In addition to addressing current management issues in the WMA, these strategies should also reflect future (desired) conditions agreed to through public participation processes.

Each strategy is unpacked into its respective components below. The level of detail required per component by each WMA will vary depending on its particular circumstances.

3.3.3.1 Water Resource Protection strategies

- Strategy for maintaining desired Resource Quality Objectives
- Strategy for designing, implementing, reviewing Source Directed Controls
- Strategy for dealing with point and non-point sources of pollution
- Economic incentives for reduction in pollution
- Strategy for dealing with hazardous spills, import & disposal of toxic waste
- Strategy for dealing with ecosystem components under stress or threat
- Co-operative governance strategy for landuse planning, impact assessment

3.3.3.2 Water use strategies

- Strategy for over-allocated catchments
- Strategy for under utilised catchments
- Water allocation strategy (for allocatable volume) – this must stem from water allocation principles (see Chapter 2) and should incorporate suitable time frames to allow for evaluating actual use against allocated use, and for review of activities associated with initial allocation
- Water pricing strategy
- Strategy for general authorisations
- Strategy for licence application (individual and compulsory)
- Strategy for trading water rights
- Strategy for upliftment programmes
- Strategy for future demands

3.3.3.3 Water Resource Development Strategies

- Assessment of existing water supply schemes – efficiency and financial viability
- Strategy for evaluating new development proposals
- Strategy for future and potential transfers
- Strategy to integrate land development initiatives (SDI, LDO etc)

3.3.3.4 Water Resource Conservation Strategies

- Establish demand management strategies for user sectors making use of guidelines being developed by Directorate: Water Conservation, DWAF)
- Identify and prioritise catchments where water is not efficiently and effectively used, and strategise how WDM/WC measures should be implemented

3.3.3.5 Water Resource Management Strategies

- Overall management strategy for quantity management (reference could be made to studies undertaken by Directorate: Water Resource Planning)
- Overall management strategy for quality management (reference could be made to studies made by Directorate: Water Quality Management)
- Overall strategy for ecological sustainability and reliability
- Overall strategy for financial viability
- Strategy for integration of protection, use, development, conservation and control of water resources

3.3.3.6 Water Resource Control Strategies

- Establish and evaluate status of existing quantity and quality monitoring in WMA
- Develop strategy to upgrade and maintain monitoring system to satisfactory levels and to possibly introduce new monitoring systems (eg biomonitoring).
- Develop appropriate strategies for flood, drought and pollution disaster management
- Establish database of dam safety reports and maintain regular safety inspections.
- Develop risk management strategies for reliability of supply, major disasters etc.

3.3.3.7 Integration of Strategies

As stated earlier, the Foundation strategies are not totally independent of the Supporting strategies but that they were kept separate to facilitate preparation of the CMS. The CMA must bear in mind the potential linkages before preparing the individual strategies so that duplication can be avoided and streamlining optimised.

With regard to the foundation strategies, the following grouping shows linked strategies (additional linkages may be included as appropriate):

Situation assessment - RDM strategy – Response to NWRS strategy

Situation assessment – Stressed catchments strategy

Institutional development strategy – Co-operative governance strategy – public participation strategy

Spatial/land use planning strategy – Data collection and information strategy – Co-operative governance strategy

Communication and public relations strategy – public participation strategy – capacity building and education strategy

Human resources strategy – finance strategy – auditing and review strategy

The supporting strategies concerning water resource protection, use, development, conservation, and control are inherently linked through optimum benefit in the public interest through economic efficiency, ecological sustainability and social equity. Note that Water Resource Management Strategies have been omitted from this list as they merely reflect the underlying management philosophy that applies to the WMA as a whole.

3.4 What will a CMS look like in practice?

It is desirable to prepare a generic format for a Catchment Management Strategy that is based on the elements discussed above and equally applicable to any WMA. This will not only provide a template to assist in the preparing and developing a CMS but will also ensure consistency between different CMSs.

The generic CMS format will contain most of the information outlined in section 3.2 above except that the headings and sub-headings follow a particular structured number system. Therefore, to avoid repeating the contents of sections 3.2 and 3.3 here, the reader is referred to Appendix A for the generic format of the CMS. It should be noted that the headings and numbering system should therefore be strictly adhered to, in order to facilitate consistency and cross referencing between the 19 CMSs that will eventually be produced.

3.5 Catchment Management Plans

Stress in a catchment, whether related to water quantity, quality or the environment could lead to remedial action being taken depending on the severity of the stress. The proposed remedial action must be incorporated into a catchment management plan (CMP), which recognises that water resources should be managed in an integrated manner. Although CMP is introduced here with respect to stressed catchments, it must be emphasised that in the long term, a CMP will be required for all catchments in a WMA. For efficient use of human and financial resources, stressed catchments will tend to receive attention ahead of unstressed catchments.

Although a CMP is a self contained process, it must not be in conflict with the overall objectives and framework of the CMS, The CMP will address of at least the following steps and associated subheadings:

- **Initiation:** beginning the process, establishing relevant institutions, identifying the key issues
- **Characterisation:** assembling and analysing data, understanding the issues and requirements for managing the key issues
- **Setting objectives:** determining the outcome required for satisfactory management of the key issues, identifying and prioritising the strategies and actions needed to achieve them. The strategies and plans for this step will be derived from the matrix.
- **Implementation:** carrying out the identified strategies and action plans in a

co-ordinated manner

- **Monitoring and Review:** monitoring and evaluating the process as far as meeting the objectives and adjusting the process where necessary

The entire process will be managed through the CMS by the CMA. A CMP for a stressed catchment will only be prepared if the need has been identified by the CMA or through stakeholder participation and through the identification of stressed catchments in the “Stressed Catchment Strategy” of the CMS. In a complex WMA, there could be a series of catchment management plans appended to the CMS, or initially identified and then prepared in a phased manner.

3.6 How does one define and then grade stress in a catchment?

The state of stress relates directly to the water resources in the catchment, although other factors such as social, economic and political could have an indirect impact. Three aspects of the resource have been identified as appropriate stress indicators, namely Water quantity, Water quality, Ecological conditions. Details of how these stress indicators can be used to evaluate overall stress are discussed in Appendix-----.

3.7 Using a management matrix for stressed catchments

The actual format and structure of a catchment management plan falls outside the scope of this document. However, to assist with the preparation of a catchment management plan, a management matrix has been developed (see Figure 8 in the Appendix)

The matrix consists of management methodologies (strategies, guidelines, plans and procedures) for a range of management functions (protection, use, development, etc). The main purpose of the matrix is to provide a list of strategies and plans that can be incorporated into a catchment management plan for any catchment - stressed or unstressed. Unstressed catchments will select only those strategies, plans etc of the matrix that are applicable, whereas stressed catchments are likely to use all (if not most) of the items in the matrix. A description of what each management function in the matrix means, appears in the Appendix.

CHAPTER 4. THE ROLE OF INSTITUTIONS IN CATCHMENT MANAGEMENT STRATEGIES

4.1 CMS as an initial function of a CMA

Following its establishment, a Catchment Management Agency will be expected to perform five initial functions, which are

- Investigate and advise interested persons on the protection, use, development, conservation, management and control of the water resources in its WMA (this will be covered in the water management strategies, and some of the baseline strategies such as public relations, capacity building and public participation)
- Develop a Catchment Management Strategy
- Co-ordinate the related activities of water users and of water management institutions within its WMA (this is covered by the institutional development baseline strategy)
- Promote the co-ordination of the implementation of its CMS with the implementation of any applicable development plan in terms of the Water Services Act (this will be covered by the co-operative governance and institutional development baseline strategies)
- Promote community participation in its functions (this will be covered by the public relations, capacity building and public participation baseline strategies)

The CMA can carry out all these functions in-house; otherwise it can delegate (powers and duties), contract or outsource a wide range of functions to other institutions with the necessary technical and administrative ability. Details of how the CMA may conduct its activities with other institutions can be obtained from DWAF Guide 2: The Catchment Management Agency as an Organisation.

4.2 Co-operative governance

Co-operative governance is a Constitutional imperative. It recognises that, although many government functions are undertaken in national, provincial or local spheres, there must be commitment to co-operation between each sphere, since it has a profound effect on water resource management. The principles of co-operative government and intergovernmental relations have been specified in sections 40(2) and 41(1) of the Constitution. According to these, all spheres of government and organs of state must co-operate with one another in mutual trust and good faith by fostering friendly relations, assisting and supporting one another, informing and consulting one another and co-ordinating their actions.

For further discussion of this topic, the reader is referred to the document on the “Roles and Inter-relationships of Institutions involved in the management of water resources” produced by the Directorate : Catchment Management. The document covers roles and inter-relationships, and how these institutions will interact.

CHAPTER 5. CONCLUDING REMARKS

The study commenced with the following main objectives:

To explain the fundamental elements of the Catchment Management Strategy (CMS) as defined in the National Water Act (36 of 1998)

To present a generic framework for developing a CMS for a Water Management Area (WMA).

The elements of CMS as defined in section 9 of the National Water Act provide an indication of the minimum legal requirements for what should be contained in a CMS. A discussion of the contents of section 9 appears in Appendix C of this document. The elements of CMS contained in section 9 have been incorporated into the development of the CMS framework which constitutes the crux of this document.

With regard to the second objective, the generic framework for CMS has been developed in Chapter 3 of this document. In essence, a CMS for a WMA comprises three main components:

- A situation assessment, characterising the WMA and providing relevant information as a basis for planning and strategy formulation.
- A set of Foundation strategies that provide the over arching framework for managing water resources in the WMA but do not deal with specific aspects of water resource management. These strategies create the framework for human and financial resources and the institutional development necessary to involve and deal with stakeholders as well as to implement the strategies. Foundation strategies provide the enabling framework to get from the situation assessment (“where we are now”) to the water management strategies (“where we would like to be”).
- A set of Supporting strategies to protect, use, develop, conserve, manage and control water resources in the WMA. These strategies are viewed as the minimum requirements for covering as many aspects as possible of water resource management of the WMA.

Integration of Strategies. The Baseline and Water management strategies are not totally independent of each other, but have been separated for convenience to provide some structure and facilitate the compilation of the CMS in appropriate components. The linkages between the strategies must be outlined to integrate and streamline the various management initiatives.

In addition to the above, Catchment Management Plans (CMP) must be prepared for all catchments within the WMA. The basic structure of a CMP and use of a management matrix to facilitate development of a CMP are presented in Chapter 3. The preparation of CMPs can be done in a phased manner, giving priority to catchments.

Conditions affecting the development of a CMS are outlined in Chapter 2. Most of the conditions relate to aspects of the National Water Act, Water Services Act, other legislation, and various initiatives undertaken by DWAF; they are either informative, or form part of the requirements of, or constraints to, the development of a CMS.

Institutional linkages associated with CMS are discussed in Chapter 4, in respect of institutions involved with the development of CMS, and co-operative governance issues; the relevance socio-economic, environmental and technical linkages, and water user sectors can be inferred from other documents such as the Guidelines on Public Participation, being undertaken under the Directorate: Social and Ecological Services.

CHAPTER 6. AREAS REQUIRING FURTHER INVESTIGATION

There are numerous facets of the NWA and Water Services Act that have prompted initiatives and investigations by DWAF and others, and these are likely to continue in the foreseeable future. Most of these investigations impact in some way or other on CMS and this document may therefore need to be reviewed on a regular basis as the current and future investigations are finalised.

Some of the areas that need particular attention as far as this study is concerned include

- The relationship between the CMS and co-operative governance.
- How should public participation be facilitated in the development and implementation of CMS?
- What are the legislative interlinkages that influence CMS and how should they be managed

APPENDIX A

Generic format of the contents of a Catchment Management Strategy

Name of WMA:

Date of commencement of CMS framework:

Prepared by: DWAF (HO or RO), or CMA

Situation Assessment (from WRSAS project)

Description of physical and hydrogeological characteristics

Map of WMA with all rivers, quaternary boundaries, urban and rural settlements, provincial and municipal boundaries

Topography and catchment areas

Geological characteristics

Natural vegetation

Ecologically sensitive areas (parks, reserves, wetlands, corridors, estuaries, lakes etc)

Description of main water resources, mean annual runoff per quaternary

Water supply schemes and associated infrastructure

Major water users per quaternary (present and projected demands)

Groundwater potential

Land use

Demographic profile

Urban and rural areas

Population numbers and locality

Economic overview

Overview of economy of WMA

Major development, employment, growth trends

Water Balance status (from NWRS)

Reserve, international obligations, interbasin transfers, strategic uses

Allocatable volume

Resource Quality Objectives

Water Resource Management class (I, II or III)

Aquatic ecosystem class (A, B, C or D), drinking water class (0,1,2,3,4), requirements for water users (agriculture, recreation, industry, bulk domestic)

Compliance requirements

FOUNDATION STRATEGIES

These strategies are required to provide the overarching framework for integrated management of water resources and will therefore be considered by every WMA. Each strategy will have the same basic structure, namely

Purpose of strategy

Content of strategy
Desired outcomes of strategy
Monitoring and Review

The purpose and contents of each strategy are summarised in the main document. The discussion of each strategy below covers the contents and other explanatory notes. In each case, certain Directorates and other institutions have been listed for reference during the preparation of the particular strategy. The list is not intended to be comprehensive; other Directorates/institutions may be suggested in discussions with those listed below. The desired outcomes, monitoring and review aspects can be dealt with in a phased manner at a later stage.

RDM strategy: This strategy will have to allow for starting with preliminary classes and Reserve, progressing over time to full classification (with full public participation) and comprehensive Reserve. It will therefore establish a database of, and understand the reserve, management classes and RQOs of all resources established by the Minister and to develop strategies to achieve these. As these will be done at catchment scale (typically tertiary), there is likely to be a variation of classes and RQOs across each WMA. In some catchments the strategy will be to plan for the maintenance of the status quo. In catchments where there has been significant modification from natural conditions, the strategy will consider the option of maintaining or upgrading the management class, and the implications of each option (eg the time frames within which to achieve the class). These implications will be defined by the relationship of the current state of the resource to the desired management class

Institutional linkages: RDM Office (DWAF)
 D: Water Resources Planning
 D: Water Quality Management
 D: Social and Ecological Services
 D: Water Utilisation
 Institute for Water Quality Studies
 DWAF Regional offices

NWRS strategy: to understand the nature and implications of the Reserve, water availability (allocatable portion), water balance, transfers, international obligations and strategic uses determined by the NWRS. Initially, the NWRS will deal with these parameters at quaternary scale, presenting it in “embryo” form for the CMS Eventually, the figures that the NWRS does present must be honoured by the CMA in developing the CMS. The main issue here is, to establish a strategy that will meet the parameters established by the NWRS. A request for clarification or challenge of the NWRS requirements may be made where valid reasons exist , although this is likely to be an exception and not a rule.

Institutional linkages: RDM Office (Reserve)
 D: Water Resources Planning

D: Strategic Planning
D: International Liaison
D: Water Quality Management
D: Social and ecological services

Stressed catchments strategy: there is a strong call in the National Water Policy to give priority to stressed catchments over others as they are likely to benefit the most from the new policy. With this in mind, the strategy here is to identify stressed catchments in the WMA (at quaternary or tertiary scale) using water quantity, quality, and ecological or other criteria, prioritise these catchments for development of sub strategies (or catchment management plans), develop a strategy for more detailed assessment of certain catchments (if necessary), and for preparing and implementing catchment management plans. A strategy for dealing with unstressed catchments should also be prepared. Initially, these may be only conceptual, with regard to maintaining the status quo, but should also look at development potential with regard to water resources.

Institutional linkages: D: Water Resources Planning
 RDM Office
 D: Water Quality Management
 River Health Programme
 D: Water Conservation
 D: Social and Ecological Studies
 Institute for Water Quality Studies
 Other Govt Depts (Minerals And Energy, Agriculture,
 DEAT)

Institutional development strategy: establish nature, scope and extent of existing institutions and their role and capacity, evaluate existing institutions with respect to amalgamation, change(s) to or disestablishment, develop plans for fostering growth and involvement of existing institutions, decide on number of new institutions that are desirable at different levels ie community (forum), committee and advisory, and facilitate their establishment and sustainable activities, establish a communication mechanism to address the problem of geographic scale and remoteness, clarify roles and relationships between statutory, non statutory institutions, water management institutions, government departments, and stakeholders. In view of the comprehensive range of activities anticipated in this strategy, it is important that the list of activities be prioritised.

Institutional linkages: D: Local Institutional Development Support
 D: Catchment Management
 DWAf Regional Office
 Dept of Provincial and Local Government
 South African Local Government Association

Spatial/landuse planning strategy: establish layout and connectivity between new municipal boundaries, provincial, and catchment boundaries, identify existing landuse

and trends in land use patterns (on GIS), identify existing urban, industrial and other growth nodes and corridors, investigate spatial compatibility between development and water locality/availability, establish contact and liaise with Dept of Land Affairs regarding land redistribution programme, establish database of water use and overview of landuse and the relationship with regional economy, interact with landuse planning sections of other government departments (national and provincial) with a view to influencing the water related aspects of such plans, identify related land/water development initiatives eg SDIs, LDOs and assess their impacts on water resources, develop strategy to integrate initiatives with CMS

Institutional linkages: Department of Land Affairs (National, provincial)
 Department of Agriculture
 Dept of Environmental Affairs and Tourism
 Department of Trade and Industry
 Provincial Depts of Environment
 Provincial Depts of Planning/ Development Planning
 Municipality Demarcation Board
 Regional Services Councils
 Local Authorities

Human Resource strategy: establish management philosophy with regard to human resources (eg “lean and mean” versus “bureaucracy”), identify management roles and responsibilities, tasks and associated resource requirements.

Institutional linkages: D: Human Resources Development
 D: Local Institutional Development Support
 D: Catchment Management
 D: Social and Ecological Services
 Department of Labour

Co-operative governance strategy: identify the various directorates/ departments/officials at national, provincial and local government level who are actively involved (or should be) in catchment management or water resource matters, establish contact with them, and develop a communication strategy to promote joint planning and develop common approaches with them.

Institutional linkages: D: Local Institutional Development Support
 Department of Constitutional Development
 DWAF Regional Office
 D: Catchment Management

Communication and public relations strategy: identify all stakeholders, select medium (media) for communicating WMA and strategy developments to public and stakeholders, select programme of disseminating general information geared towards promoting

proactive participation (for example, the subject of user charges), create appropriate opportunities/forums for stakeholders to verify basic information used in decision making processes and to express comment, criticism etc

Institutional linkages: D: Communications
 D: DWA Regional Office

Data collection and information strategy: The WRSAS database will be the default case for each WMA with regard to basic data about the characteristics of each quaternary in the WMA. This strategy will be to decide what additional data needs to be collected, how, and at what level of resolution, develop central database accessible via the internet, devise and implement data update mechanisms, develop alternative methods of making data accessible in remote or rural areas, and to prioritise these activities.

Institutional linkages: D: Geomatics
 D: Water Resources Planning
 D: Water Quality Management
 D: Water Conservation

Capacity building/education strategy: to build capacity with a view to developing better understanding of catchment management to improve the level of participation in management of water resources, investigate age profiles, language and literacy levels, identify areas where community involvement already exists to add to their capacity, develop strategies for the focussed capacity building initiatives (eg basic knowledge, rights and responsibilities), investigate options for education programmes at school and tertiary level, investigate training programmes for catchment management “officers” and water committees, identify existing training programmes, develop strategies for funding of capacity building, training programmes, pilot projects. In view of the number and diversity of the challenges in this strategy, activities need to be prioritised.

Institutional linkages: D: Communications
 Provincial Education Department
 Working for Water
 River Health Programme
 CD: Water Services

Auditing and review strategy: decide what aspects of CMS to audit and who should audit (eg Auditor General will audit finances of CMA), what standards are going to be applied, type and frequency reporting, independent (external) auditing. Details on monitoring and auditing will be addressed in a subsequent document.

Institutional linkages: Auditor-General
 Various Directorates, depending on aspect of CMS to be audited

Conflict management strategy: to anticipate potential sources of conflict/dispute,

appoint advisory committee to assist on legal matters, identify potential dispute issues regarding water resource protection and utilisation, develop a dispute resolution strategy, look at Water Tribunal role

Institutional linkages: D: Legal services

Financial strategy: prepare overall business plan, investigate income sources, expenses such as the costs of implementing strategies, liabilities, credit options, loan facilities etc., strategise towards financial stability and growth, establish regular auditing and review mechanisms. Aspects of financial strategies will be covered in a separate document produced by Catchment Management or another Directorate.

Institutional linkages: D: Water Utilisation
Auditor-General

Public participation strategy: to facilitate effective participation of the public, examine demographic profile and current institutional framework, strategise on ways of informing, inviting and involving interested stakeholders in CMS process, investigate possible constraints to participation and find ways of addressing them if appropriate.

Institutional linkages: D: Water Resources Planning
RDM office
DWA Regional office
D: Social and Ecological Services
D: Catchment Management

SUPPORTING STRATEGIES

These strategies are deemed to be essential for all WMAs in order to effectively manage water resources in their regions. In addition to addressing current management issues in the WMA, these strategies should also reflect future (desired) conditions agreed to through public participation processes.

Each strategy is unpacked into its respective components below. The level of detail required per component by each WMA will vary depending on its particular circumstances.

Water resource protection strategy:

Management class, RQOs and Source Directed Controls

develop strategies for achieving desired management class and RQOs and for upgrading RQOs, develop strategy for designing, implementing, maintaining and reviewing Source Directed Controls, update and improve protocols

Water Quality (Groundwater and surface water)

Establish nature and extent of point sources and non point sources (ground and surface water), investigate extent to which existing standards are being implemented, investigate merits of promoting implementation of existing standards versus developing new ones, identify existing remediation plans and devise new ones, develop incentives for pollution reduction and use of best available clean technology, establish acceptable limits for contaminants, establish monitoring, logging and review system

Ecologically sensitive areas

To develop a database of sensitive areas where there is impact of water use (typically national, regional and private parks and conservation areas, wetlands, natural lakes, estuaries), establish their current and future desired status and the water related implications of maintaining this status

Water use strategy:

Licensing and authorisation

Develop strategies for when/where compulsory licensing should be called for, and for evaluating licence applications and general authorisations, and reviewing licences

Water allocation and use

Identify over-allocated catchments and develop strategy for resolving allocations in those catchments, investigate groundwater potential where not already is use, and limitations of sustained use, develop water allocations principles and allocation strategy taking quantity and quality issues into account, establish mechanisms for monitoring and review of allocation versus usage, develop strategy for incentives and rewards for reducing usage ,develop strategy for trading water allocations.

Water resource development strategy:

Existing water supply schemes

Develop a database of non-DWAF/National bulk water supply infrastructure, the ownership, location, and capacity and area of supply of schemes, operating rules, efficiency and financial status.

Augmentation of supply

Identify areas with current and projected shortages of water supply, and investigate options for reconciling demand and supply (surface and ground sources), their associated costs, social and environmental impacts, develop strategy for evaluating new water

supply development proposals (consider protocol developed by D:Water Conservation and D:Water Resources Planning), assess potential for intra-catchment transfers from water-rich catchments, develop criteria for evaluating merits of transfers including cost/benefit analyses and socio-economic impacts, identify water conservation/demand management potential.

Related development initiatives

Identify nature and extent of SFRAs and controlled activities and their impact on water resources

Productive use of water

Develop strategy for upliftment and development programmes with regard to the productive use of water

Water resource conservation strategy:

Investigate and establish demand management strategies for user sectors (making use of DWAFguides), develop system of comparing recorded use with “norms” or best practice figures to establish measure of efficiency, identify and prioritise catchments where water use is not efficient and effective (typically in stressed areas or where new infrastructure is needed), investigate appropriate (phased) intervention mechanisms, develop strategy for incorporating programmes such as “Working for Water”

Water resource management strategy

Because of the large geographic extent of WMAs and the phased manner in which the strategy will be implemented, it is important that there is consistency with regard to the main aspects of water management as and when they are applied, namely quantity, quality, ecology, finance and integration. In this respect, the minimum requirement is a “benchmark” statement of philosophy and objectives in each of the listed areas of water management, to which constant reference can be made to in time, and which could be reviewed at appropriate intervals.

Develop Overall management strategy for quantity and quality management, aimed at striking a balance between protection and utilisation, and fitness for use on a sustained basis (reference should be made to studies undertaken by Directorate: Water Resource Planning and Water Quality Management). Develop Overall strategy for ecological sustainability and reliability. Overall strategy for financial viability. Strategy for integrating protection, use, development, conservation and control of water resources.

Water resource control strategy

Investigate and evaluate status of existing water quantity and quality monitoring, develop

strategy to upgrade (where necessary) and maintain monitoring system to satisfactory levels, develop appropriate strategies for floods, droughts and pollution disaster management, consider development and use of Environmental Risk Assessment methodologies, establish database of dam safety reports and maintain regular safety inspections.