

**DEPARTMENT OF WATER AFFAIRS AND FORESTRY**

**No. 201**

**16 March 2007**

NATIONAL WATER ACT (ACT No. 36 OF 1998)

**ESTABLISHMENT OF A PRICING STRATEGY FOR WATER USE CHARGES IN TERMS OF SECTION 56(1) OF THE NATIONAL WATER ACT, 1998**

I, Lindiwe Benedicta Hendricks, MP, Minister of Water Affairs and Forestry, with the concurrence of the Minister of Finance, hereby in terms of section 56(1) of the National Water Act (Act No. 36 of 1998), establish a pricing strategy for raw water use, as contained in the schedule hereto.

SCHEDULE

**A PRICING STRATEGY FOR RAW WATER USE CHARGES**

**PREFACE**

The National Water Act, 1998 (Act no. 36 of 1998), gives power to the Minister with the concurrency of the Ministry of Finance, from time to time by notice in the Gazette to establish a pricing strategy for charges for any water use within the framework of existing relevant government policy.

The previous pricing strategy was published in November 1999 and since its publication there have been various developments that necessitate this review which include:-

- The implementation of the Municipal Finance Management Act
- Further developments to the Departmental computer system for charge administration
- The incorporation of the Waste Discharge Charging System
- Requests from stakeholders for a review of the strategy
- Capital projects funded by private sector funding

The Pricing Strategy in addition to the above must also consider the development of Catchment Management Agencies, which will have a significant bearing on the way water resources are managed and protected.

This document sets the strategy for implementing water management practices according to the user pays and polluter pays principles and is the result of a process of consultation as required by the Act. Interested parties contributed to the final form of this document through their comments, which were considered and, where acceptable, incorporated into the strategy.

The measures adopted I believe have resulted in a document that takes into consideration the diverse and sometimes competing interest of various sectors while at the same time promoting efficiency and redressing the imbalance in access to water as a result of past laws.

**Lindiwe Benedicta Hendricks, MP**

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### ABBREVIATIONS

CMA	=	Catchment Management Agencies
CUC	=	Capital Unit Charge
DWAF	=	Department of Water Affairs and Forestry
GWS	=	Government Water Schemes
IAP	=	Invasive Alien Plant
NWA	=	National Water Act, 1998 (Act 36 of 1998)
NWRIA	=	National Water Resource Infrastructure Agency
NWRS	=	National Water Resource Strategy
O&M	=	Operations and Maintenance
PPI	=	Producer Price Index
ROA	=	Return on Asset
RQO	=	Resource Quality Objective
SFRA	=	Stream Flow Reduction Activities
TCTA	=	Trans Caledon Tunnel Authority
WARMS	=	Water Use Authorisation & Registration Management System
WDCS	=	Waste Discharge Charge System
WMA	=	Water Management Area
WMI	=	Water Management Institutions
WRC	=	Water Research Commission
WRDC	=	Water Resource Development Charges
WRM	=	Water Resource Management
WSDP	=	Water Services Development Plan
WUA	=	Water User Associations

## **1 INTRODUCTION**

This document is the first revision and extension of the Pricing Strategy for raw water use charges which was published in the Government Gazette No. 1353 of 12 November 1999.

This strategy refers to pricing for the use of water from South Africa's water resources and not to the pricing of water services, which is dealt with separately under the Water Services Act, 1997. In other words, the approach deals with first tier water, i.e. the use of raw (untreated) water from the water resource and/or supplied from a government waterworks. It does not deal directly with second and third tier water, i.e. water supplied in bulk (often by water boards) and distributed to households (usually via a water services authority), except for water supplied from government water schemes. The strategy deals with all first tier water as reflected in the use of ground and surface water resources and covers the setting of prices by DWAF as well as by water management institutions as defined in the NWA.

## **2 LEGAL MANDATE**

In terms of Section 56 of the NWA, the Minister may, with the concurrence of the Ministry of Finance, from time to time by notice in the Government Gazette, establish a pricing strategy for charges for any water use within the framework of existing relevant government policy.

The Pricing Strategy contains the objectives, methodology and implementation strategy for setting water use charges for purposes of:-

- funding water resource management by DWAF and water management institutions, through water use charges, Section 56 (2) (a).
- funding water resource development and use of waterworks by DWAF and water management institutions, Section 56 (2) (b).
- achieving the equitable and efficient allocation of water, through a charge hereafter referred to as the "economic charge", Section 56 (2) (c).
- providing for a differential rate for waste discharges, hereafter referred to as the WDCS, Section 56 (5).

## **3 THE OBJECTIVES THAT SHAPE THE PRICING STRATEGY**

The following objectives are of principal importance when formulating or amending the pricing strategy:

- Social equity

The Pricing Strategy for water use charges coupled to the granting of financial assistance will contribute to social equity and redress of the imbalances of the past, both with respect to equitable access to water supply services and direct access to raw water.

- Ecological sustainability

In terms of Chapter 3 of the NWA, the water needs for the effective functioning of aquatic ecosystems must be protected. The water required for the ecological reserve must be safeguarded and the cost of managing the Reserve must be paid for by all registered and billable users in terms of Section 56(2) (a) (iv) of the NWA. To promote the preservation of resource quality, the polluter pays principle for waste discharge is adopted in this pricing strategy.

- Financial sustainability

In order to ensure financial sustainability adequate revenue must be generated to fund the annual cost related to:

- the management of the country's water resources.
- the operations, maintenance, refurbishment and betterment of existing Government water schemes and waterworks owned by water management institutions.
- the development of new user-funded schemes.

The financial framework makes accommodation for the financial autonomy of WUAs and CMAs. As stated in the previous Pricing Strategy, the full financial cost of water resource management and supplying water should be recovered from water users, including the cost of capital. While it is important to keep water prices as low as possible, DWAF has to ensure that water is priced at levels consistent with efficient and effective delivery of services. This approach may be phased in by taking account of constraints of various sectors to adapt quickly to price increases.

- Economic efficiency

In the context of water scarcity, ensuring an efficient allocation of scarce water resources requires that the price of water is set to reflect its scarcity value, to ensure firstly that water is conserved and secondly that some water used for low-value purposes is redirected to alternative high value purposes. This can be done administratively or by using market related mechanisms. It is also critical to ensure that the water resource management systems implemented are cost effective and do not become an unnecessary financial burden on the water users.

## 4 CLAIMS ON WATER NOT SUBJECT TO PRICING

- **Permissible water use as described under Schedule 1 of the NWA and generally authorised.** A person may use water in or from a water resource for purposes such as reasonable domestic use, non-commercial gardening, animal watering, fire fighting and recreational use, as set out in Schedule 1 of the NWA. General authorisations in terms of section 39 of the NWA also allow certain water uses not to register, which would then not be charged.
- **Basic human needs.** This represents the first component of the Reserve as defined in Section 1 of the Act, and provides for the essential current and future (10 years horizon) needs of individuals served by the water resources concerned and includes water for drinking, food preparation and personal hygiene defined as 25

litres per capita per day. The Schedule 1 use contains a basic human needs component for certain individuals who access the water resources directly.

- **Ecological sustainability.** This represents the second component of the Reserve and refers to water (quantity and quality) required to protect the aquatic ecosystems of the water resources and ensure their sustainability.
- **International obligations.** The water required to meet South Africa's commitments regarding international waters will receive priority and will not be allocated for pricing purposes, except where specific agreements have been reached concerning the supply of water to neighbouring countries.

After the above claims have been met, the remaining water, including water imported from other water management areas by means of inter-basin transfer schemes can be made available for various uses. This water use is classified as productive use of water and is subject to pricing in terms of this strategy.

## 5 DEFINITIONS OF WATER USE

Section 56 of the NWA instructs the Minister to establish a Pricing Strategy for charges for any water use described in Section 21:

- (a) taking water from a water resource;
- (b) storing water
- (c) impeding or diverting the flow in a watercourse;
- (d) engaging in stream flow reduction activity;
- (e) engaging in controlled activity which may have a detrimental impact on water resources;
- (f) discharging waste or water containing waste into a water resource;
- (g) disposing of waste in a manner which may detrimentally impact on a water resource;
- (h) disposing of water which contains waste from any industrial or power generation process;
- (i) altering the bed, banks, course or characteristics of a watercourse;
- (j) removing, discharging or disposing of water found underground for continuation of an activity;
- (k) using water for recreational purposes.

The above-mentioned water uses can be broadly grouped under three categories in the NWA:

### **Abstraction related uses**

- Section 21 (a), Section 21 (b) and Section 21 (d)

### **Waste discharge related uses**

- Section 21 (e), Section 21 (f), Section 21 (g), Section 21 (h) and Section 21 (j)

### **Non-consumptive uses**

- Section 21 (c), Section 21 (e), Section 21 (i), Section 21 (j) and Section 21 (k)

The pricing strategy prioritises uses of water stated above, and over time will charge for most defined water use after consultations with stakeholders. Strategies are already in place and under review for abstraction related uses. With the implementation of the waste discharge charge system, most of the above-mentioned use will be charged for.

A strategy is also being developed for section 21 (k), recreational use and will form the subject of a separate publication.

## **6 FUNDING OF WATER RESOURCE MANAGEMENT**

Water Resource Management expenditure relates to those activities that are required to protect, allocate, conserve, manage and control the water resources and manage water quality located within Water Management Areas (WMA). These costs do not relate only to water subject to pricing, but to the management of all water within a water management area. These costs could include but are not limited to the following activities:-

- Planning and implementing catchment management strategies.
- Monitoring and assessing water resource availability and use.
- Water use allocations.
- Water quantity management, including flood and drought management, water distribution, control over abstraction, storage and stream flow reduction activities.
- Water resource protection, resource quality management and water pollution control.
- Water conservation and demand management.
- Institutional development and enabling the public to participate in water resources management decision-making.

A more detailed description including a split between abstraction and waste discharge activities is provided later in this document.

Initially water resource management will continue to be the task of DWAF. However, the NWA clearly states that the intention is to create CMAs (the first of which have been established) to whom DWAF will delegate or assign significant water resource management functions (The activities of the CMAs will be funded largely from water resource management charges). In WMAs where CMAs do not exist, DWAF will function as the CMAs until they are established. Regional offices will undertake WRM functions in WMAs where not all functions have been delegated to CMAs due to a lack of capacity. In WMAs where both DWAF and CMAs are performing WRM functions, income will be shared pro-rata to input cost and this split will be reflected in all sectoral charges.

### **6.1 Budgeting of activity costs**

DWAF/CMAs will budget annually for the estimated costs of activities to be performed by them in each WMA. The WRM functions that may be relevant are shown in the schedule hereunder. The division of functions between abstraction and waste discharge related uses will be done in accordance with the schedule hereunder. The water resource management charge for abstraction related water uses will be based on the budget for abstraction activities and integrated functions. The cost of waste discharge activities and integrated functions will be used for setting the waste discharge component of the WRM charge.

The costs of certain functions may be entirely allocated to either abstraction or waste discharge related uses as indicated, while there are other functions that are inherently integrated in nature. The costs of integrated functions need to be allocated between abstraction and waste discharge related use in a transparent manner reflecting the

management effort incurred in the WMA. Allocation of the costs of integrated functions between waste discharge and abstraction will therefore be according to the management effort (resources) being allocated to abstraction related uses versus management effort allocated to waste discharge related water uses within the WMA.

An inter-basin transfer scheme refers to infrastructure constructed to transfer water between river systems located in different WMAs, in order to augment the allocable yield of water stressed catchments. Examples are the Riversonderend – Berg River, Tugela – Vaal, Orange – Fish, Tugela – Mhlathuze and Usutu – Vaal transfer schemes, constructed by DWAF.

Water to be imported via an inter-basin transfer scheme will reduce the potential for generating funds in the donor WMA through water use charges and increase the potential in the receiver area. This loss in income in the donor WMA must be funded by water use charges raised in the receiver WMA. The receiver CMA must reimburse a fixed portion of the WRM budget of the donor CMA, based on the yield transferred calculated as a fraction of the total available yield at 98% assurance of supply, in accordance with the NWRS.

If the receiver WMA is still managed by DWAF and the donor WMA is taken over by a CMA, then DWAF needs to pay the CMA. If both the receiver and the donor WMA are still managed by DWAF, then DWAF will ring fence the transfer payment and spend this amount in the donor catchment.

Where the quality of streamflow from an upstream WMA to a downstream WMA imposes an additional water quality management cost on the downstream WMA, this additional cost needs to be funded by WRM charges on waste discharges in the upstream WMA. The upstream CMA must reimburse a fixed portion of the WRM budget of the downstream CMA (related to the additional water quality management cost), based on the discharge load in the upstream WMA as a ratio of the total discharge load in the downstream WMA.

**6.2 Water resource management activities that could be taken into account for charge setting includes:**

<b>No.</b>	<b>Function / Activities</b>	<b>Abstraction activities</b>	<b>Waste discharge activities</b>
1	Catchment management strategy	<ul style="list-style-type: none"> <li>Resource studies, investigations and integrated strategy development</li> <li>Allocation plans</li> </ul>	<ul style="list-style-type: none"> <li>Water quality management plan</li> </ul>
2	Resource directed measures	<ul style="list-style-type: none"> <li>Reserve determination, Classification &amp; Resource quality objectives.</li> </ul>	
3	Water use authorisation	<ul style="list-style-type: none"> <li>Registration and verification of water use</li> <li>Abstraction &amp; stream flow reduction activities licensing</li> <li>Dam safety regulations</li> </ul>	<ul style="list-style-type: none"> <li>Waste discharge &amp; marine outfall licensing</li> </ul>
4	Control and enforcement of water use	<ul style="list-style-type: none"> <li>Abstraction &amp; stream flow reduction activities control &amp; monitoring</li> <li>Dam safety control</li> </ul>	<ul style="list-style-type: none"> <li>Waste discharge and marine outfall control &amp; compliance monitoring</li> </ul>



No.	Function / Activities	Abstraction activities	Waste discharge activities
		(private dams)	
5	Disaster management	<ul style="list-style-type: none"> <li>Flood &amp; drought management</li> </ul>	<ul style="list-style-type: none"> <li>Pollution incident planning and response (management)</li> </ul>
6	Water resources management programmes	<ul style="list-style-type: none"> <li>Integrated programmes</li> <li>Abstraction programmes</li> <li>Water conservation &amp; demand management</li> </ul>	<ul style="list-style-type: none"> <li>Waste discharge programmes [e.g. cleaner technology, dense settlements, waste discharge strategies]</li> </ul>
7	Water related institutional development	<ul style="list-style-type: none"> <li>Stakeholder participation, empowerment, institutional development &amp; coordination of activities</li> </ul>	
8	Water weed control	E.g. hyacinth	
9	Terrestrial Invasive Alien Plant (IAP) (see 6.5.7)	<ul style="list-style-type: none"> <li>Control of invasive alien plants with acknowledged negative impacts on water resources; e.g. riparian zones, mountain catchment areas, wetlands and in areas where there could be an impact on aquifers.</li> </ul>	
10	Geohydrology and hydrology (see 6.3.5)	<ul style="list-style-type: none"> <li>Monitoring groundwater yields &amp; compiling of maps and yield information</li> <li>Extending and maintaining the hydrological database &amp; compilation of information</li> <li>Water quality monitoring &amp; compilation of information</li> </ul>	
11	Administration & Overheads	Admin & overheads for regional office or CMA	

### 6.3 Determination of sectoral water resource management (WRM) charges per WMA for abstraction related water uses

#### 6.3.1 Water use sectors

The user sectors for which unit sectoral water resource management charges will be calculated are:

- Domestic/industrial (water services authorities, industrial, mining, strategic)
- Agriculture (irrigation of agricultural crops)
- Stream flow reduction (commercial forestry at this stage, other sectors may be added)

#### 6.3.2 Assurance of water availability

Water for productive use is available or is abstracted at different assurances and this must be reflected in the annual payment for water resource management services. Assurance of availability is taken into account by registering the estimated long-term average annual volumetric use of the various users. This determination must take into account the historic availability of water through rainfall, run-off and storage characteristics in respect of individual water users and the imposition of water restrictions during droughts. The estimated long term average water use will be based on water allocations qualifying as existing lawful use, scaled down to reflect assurance of availability.

### **6.3.3 Determination of annual sectoral use volumes per WMA for pricing purposes**

The registered water use of the various sectors must reflect volumes as determined by using the following methodologies for the water uses as defined.

#### **Section 21 (a) use**

##### **Domestic/Industrial**

- Water allocations as reflected on a lawful permit, general authorisation or licence or which constitute an existing lawful use in terms of section 32 of the NWA, and amended for assurance of supply.

##### **Agriculture**

- The existing lawful water use related to irrigated agriculture or allocated for new licences, and amended for assurance of supply. The SAPWAT programme developed by the Water Research Commission or other methods as approved by the Department will be used to determine average annual volumetric use. Irrigation quotas, amended for assurance of supply, will be registered in former water control areas and on waterworks owned by water management institutions.

#### **Section 21 (b) use**

- Where in stream located storage dams are for the enhancement of the real estate value of a property and the water stored is not diverted consumptively for productive use, the initial filling, in the case of a new dam and the annual refilling, in the case of an existing or new dam, will determine the annual volume used consumptively. The registered volume subject to pricing will be based on the estimated net annual evaporation losses from the full supply surface area of the dam under average climatic and rainfall conditions to the extent that it exceeds evaporation from natural landscape. Section 21 (b) use will be classified as domestic/industrial and charged for under this sector

#### **Section 21 (d) use**

##### **SFRA (Forestry)**

- Modified tables based on the WRC Report No TT 173/02 (April 2002): Estimation of streamflow reductions resulting from commercial afforestation in South Africa [MB Gush, DF Scott, GPW Jewitt, RE Schulze, TG Lumsden, LA Hallows and AMM Gorgens] or other methods as approved by DWAF will be used to determine average annual use of existing lawful plantations and for new licences.

The total volume of registered water use per WMA as captured by WARMS must be compared with the total yield of current resources at 98% assurance within the WMA, which can be allocated for productive purposes, in terms of the NWRS or the most recent determination. This allocable volume must exclude the quantities set aside for the Reserve, international obligations and for existing transfer to other WMAs.

Where water in a WMA is fully utilised or over-allocated (registered use exceeds allocable yield) the total volume of registered sectoral water uses will determine charges. In an under utilised WMA the volume of allocable water will determine volumetric charges. The estimated allocable sectoral use volumes will then be determined by applying the ratio of volumes registered by each sector to the allocable yield.

#### 6.3.4 Cost Allocations to Sectors

Abstraction related water resource management activity costs must be allocated to sectors in proportion to volumetric mean annual sectoral use as registered, which reflects assurance of supply. Cost allocation will thus take assurance of supply into account, and differentiate between activities. Certain activities will only benefit some sectors and therefore will not be allocated to all user sectors. Cost allocations for abstraction related uses will be determined as follows:-

- **Domestic/Industrial** – This sector will attract all abstraction related activity costs pro rata to its share of total productive use in the water management area. The basic human needs requirement (see Section 4) will be subsidised through the equitable share grants.
- **Agriculture** – This sector will attract all abstraction related activity costs pro rata to productive use.
- **Stream flow reduction activities** – Afforestation will attract all abstraction related activity costs, pro rata to productive use, except for dam safety control.

The activity input cost regarding an inter WMA transfer will be allocated only to those sectors that benefit directly from the transfer through water allocations in the receiver WMA.

#### 6.3.5 Geohydrology and Hydrology

The main charge under the above mentioned water resource management activity is for monitoring and is broken down into:-

- **Operational Purpose** – This type of monitoring is necessary for efficient water resources management and for water use billing.
- **National Network** – The national network is designed to effectively monitor the country's water resources for national water resource planning purposes. The construction cost of gauging stations and of associated water quantity and quality monitoring comprise national functions and is borne by the fiscus. DWAF head office and regional offices currently make the largest financial contribution towards identifying the need for new monitoring and continuation of monitoring at existing gauging points. Data and information gained at existing and new sites may be of direct benefit to a specific scheme or water management area. In these cases it is reasonable to charge a specific WMA or water scheme a reasonable portion for this type of monitoring.

- **Compliance Monitoring** – Reserve determinations are being made and will be made in future. It is necessary to monitor the availability of the reserve on an ongoing basis. The existing network will be utilised for the purpose of reserve monitoring. Where this is not possible, and new monitoring points are needed, the beneficiary WMA or scheme will fund this function since it is part of effective water resources management. This will be reflected in either water resource management charges or operations and maintenance charges under Section 7.1.1.

It should be noted that the need for monitoring, as captured in the priority list for new gauging stations, stems from wide consultation which identified these requirements for purposes of planning, operation, resource quality management, surface and groundwater monitoring, flood and drought management. Charges for the above will only be applied to users if the monitoring is specific to a particular water management area or a specific water scheme.

### **6.3.6 Water resource management charges**

Sectoral water resource management charges for each WMA will be calculated as follows:

- Total budget cost of each activity will be divided by the registered volumes to arrive at a unit charge per activity.
- In WMAs where the allocable yield (water available for use) is more than the registered volumes, a discount will apply, which will be determined by using the allocable yield to determine the unit charge instead of the registered volumes.
- The budgeted activity cost will be applied only to those sectors attracting such cost (e.g. the forestry sector will be excluded from charges relating to dam safety inspection).
- The unit charge for all relevant WRM activities will then be applied to each user's registered volumes to arrive at a WRM charge per user.

Unless other arrangements are approved by the DWAF/CMA the charges will result in a fixed payment, which will be invoiced on a six monthly basis for the irrigation and stream flow reduction sectors, and on a monthly basis for the other sectors. Maximum (capping) values could be determined on the basis of historical, socio-economic and other considerations and may be supported by State subsidies. Minimum cut-off values for annual payment can be laid down by CMAs where the cost of collection would exceed income. Reimbursements of inter WMA transfer payments will be done on a monthly basis in equal instalments.

It must be noted that if water use charges are too low they may lead to non-viable institutions, sub-optimal water resources services and overall deterioration of the water resources. There is therefore a need to adjust to higher real charges over time to accommodate the cost of effective and financially sustainable water management institutions, taking cognisance of affordability constraints within user sectors.

## **6.4 Determination of sectoral water resource management (WRM) charges per WMA for waste discharge related water use**

### **6.4.1 Water use sectors**

The sectors for which waste discharge related water resource management charges will be calculated are similar to the sectors for the abstraction related charges, namely municipal (domestic), industrial, mining, energy and agriculture (excluding streamflow reduction activities). However, in calculating this charge, a distinction must be made between:

- Point source discharges directly to surface water resources
- Discharge to land based facilities (with potential non-point source impacts), such as irrigated effluent, tailings dams and evaporation ponds
- Point source discharges to the marine environment (marine outfalls)

#### **6.4.2 Determination of annual waste loads per WMA for pricing purposes**

Waste is defined in terms of Section 1 (1) (xxiii) of the NWA. The calculation of charges will be based on the registered discharge waste load of salt and phosphorus, as representing the two most widespread water quality problems in South Africa, based on the following:

- Salt load will be estimated using electrical conductivity.
- Phosphorus (as the limiting nutrient for freshwater eutrophication) will be estimated using soluble phosphorus (phosphate).

The following methodology will be used to calculate waste loads for the following categories of waste discharge related water uses as defined:

**Section 21 (f) use** - Discharged salt and phosphorus waste loads calculated as the average (mean) discharge concentration times the discharge volume as reflected on a lawful permit or licence, general authorisation and/or verified as existing lawful use.

**Section 21 (g) use** - Disposed salt and phosphorus waste loads calculated as the average (mean) concentration times the volume of water as reflected on a lawful permit or licence and/or verified as existing lawful use.

**Section 21 (h) use**  
**Marine outfall** - Disposed phosphorus waste loads calculated as the average (mean) concentration times the volume of water as reflected on a lawful permit or licence and/or verified as existing lawful use.

**Other** - Disposed salt and phosphorus waste loads calculated as the average (mean) concentration times the volume of water as reflected on a lawful permit or licence and/or verified as existing lawful use.

**Section 21 (e) use**  
**Irrigation of land**  
**With waste [S37(1)a]** - Irrigated salt and phosphorus loads calculated as the average concentration times the volume of irrigated water as reflected on a lawful permit or licence and/or verified as existing lawful use.

**Controlled waste**  
**Disposal [S38(1)]** - Irrigated salt and phosphorus loads calculated as the average (mean) concentration times the volume of disposed water as

reflected on a lawful permit or licence and/or verified as existing lawful use.

The point source salt and phosphorus waste loads in a WMA will be calculated from the registered discharge load in terms of Section 21(f). This will be distinguished from the total phosphorus waste load through marine outfalls [under S21(f)] and the total salt and phosphorus waste loads disposed to facilities [S21(g)] or land [S21(e)]

#### **6.4.3 Cost allocations to sectors**

The budgeted water resources management activity costs allocated to waste discharge related water use will be allocated to the water use categories according to the ratio of management effort applied in the WMA. Certain activities will only benefit or be related to specific water use categories and therefore will only be allocated to those categories. No differentiation will be made between sectors within a water use category. Cost allocations will be based on:-

- **Point source discharges** - Management effort for point dischargers, attracting all waste discharge related activity costs.
- **Marine outfalls** - Management effort for marine outfalls, attracting waste discharge activity costs except water resources monitoring, resource directed measures and waterweed control.
- **Waste disposal to facilities / land** - Management effort for waste disposal to land, attracting all waste discharge related activity costs.
- **Irrigation of land with water containing waste** - Management effort for irrigated effluent, attracting all waste discharge related activity costs.

The additional water quality management cost related to discharge load into a downstream WMA will be allocated to the waste discharge water use categories, except marine outfalls, based on the same management effort ratios.

#### **6.4.4 Water resource management charges (Waste Discharge)**

Waste discharge related water resource management charges for each water use category in each water management area will be determined by dividing the total cost allocated to each category by the total registered waste load of salt and/or phosphate for the water use category. The cost allocation to be recovered through charges on salinity and/or phosphorus loads will be based on the relative management effort associated with these two water quality problems within the WMA. In some WMA, this implies only salinity or phosphorus discharge loads would be used to collect charges, while in other WMA the salinity and phosphorus loads would be weighted.

The charges will result in a fixed payment, which will be invoiced on a monthly or six monthly basis, according to the abstraction related invoicing cycle.

#### **6.4.5 Implementation of the charge**

The WRM charge for waste discharge will be implemented after the requirements for registration of licenses, general authorisation and confirmation of existing lawful waste discharge is completed.

## **6.5 Other funding arrangements and limitations**

### **6.5.1 SFRA (Forestry) Cap**

WRM charges to the forestry sector are capped at R10 per hectare plus Producer Price Index (PPI) rate (%) at April of each year with 2002-03 financial year as the base year. Resource poor foresters and non-irrigation growers with land equal to or less than ten hectares under cultivation will be excluded from this charge.

### **6.5.2 Irrigation Cap**

Water Resource Management charges to the irrigation sector are capped at 1.5 cent per m<sup>3</sup> plus the PPI rate (%) at April of each year with 2007-08 as base year. In instances where the actual 2006/07 charges to the agricultural sector as calculated under the 1999 Pricing Strategy would have been higher than the capped amount of 1.5 cent per m<sup>3</sup> (because of the impact of PPI resulting in charges above 1.5 cent in previous years), then the higher actual charge will be used as the base charge for charge setting purposes.

### **6.5.3 Phasing in of WRM charges**

WRM charges for resource poor farmers and resource poor forest growers will be phased in over five years through fiscal subsidy of amounts not recovered from the beneficiaries.

A differentiated subsidy policy will be applied to determine annual costs to be recovered from resource poor farmers and forest growers. A table providing details of the subsidy is provided in section 10.1. The subsidy comes into effect on the date of registration of water use by individual resource poor farmers or resource poor forest growers.

### **6.5.4 WRM functions undertaken by Water Boards, CMAs and WUAs on behalf of DWAF**

In instances where Water Boards, CMAs, WUAs or local government perform water management functions on behalf of DWAF, an appropriate agency and compensation agreement will be drawn up between DWAF and the relevant Water Board, CMA, WUA or local government.

### **6.5.5 CMA as a DWAF agent for National Functions**

A CMA may be contracted as a special project / programme (or even delegated) by DWAF to perform certain national functions, which DWAF would exclusively fund through parliamentary appropriation. A service or management fee will be payable by DWAF to the CMA as a condition of this contract or delegation. Functions that may be dealt with in this manner may include:

- National water resource monitoring (if this is not done by another institution)
- DWAF water resource management programmes or projects, where the CMA acts as an implementing agent on behalf of DWAF, possibly including compulsory licensing and classification.
- National developmental and/or empowerment programmes and projects where the CMA acts as an implementing agent for DWAF.

### **6.5.6 Other possible CMA sources of Income**

In addition to water use charges and possible financial support from parliamentary appropriation, there are a range of other lawful income sources that the CMA may consider.

- Recreational concessions – Once the concession process for recreational water use to be covered by the future pricing strategy document mentioned in Section 5, has been established, the CMA may become responsible for implementing, administering or overseeing some of these concessions.
- Licence application fees – The CMA should receive a major portion of the license application fee as soon as it is, performing licensing functions, and ultimately should receive the entire fee once it is the responsible authority.
- Donor support and sponsorship – A CMA may fund its activities through any lawful source in addition to water user charges and parliamentary appropriations, which may include donor support or sponsorship. However, transparency must be maintained, as actual or perceived conflict of interest must be avoided. This should include constraints over the types of functions that may be supported, particularly from bodies with a vested interest in the WMA. All sponsorship and donor contributions in excess of R2000 must get prior approval from the Minister of Water Affairs and Forestry.
- Contractual payments – The CMA may perform ancillary functions outside of its WMA, as well as non-water resource management activities that are related (incidental) to its functions or mandate, as long as this does not jeopardise its functions or detrimentally affect another water management institution.
- In-kind contributions – Although in-kind contributions are not explicitly income, they would reduce the expenditure and required income of the CMA. They are most relevant for institutional development and stakeholder participation related functions, but may include other bodies involved in monitoring and other water resource management activities coordinated by the CMA. All in kind contributions in excess of R2 000 will require prior approval from the Minister of Water Affairs and Forestry.

The Minister could from time to time review and amend the value of the minimum in-kind contribution, donations and sponsorship requiring prior approval by way of a written announcement.

### **6.5.7 Clearing of Invasive Alien Plants (IAP's)**

The full cost of control of certain IAP's may be charged to affected water users. In this regard the Regional Office or future CMA, in consultation with affected stakeholders, will recommend that the control of IAPs in a particular catchment is necessary for water security and, from the range of options available, the control of IAPs is the best and most cost effective action possible to increase long term water security and availability. Once agreement is reached on the method of control IAPs, and before going ahead with clearing, the total cost of control must be communicated to all affected stakeholder organisations. These costs may be supported by subsidy where available and appropriate.

The agreed upon cost of control will then be allocated to all water user sectors in proportion to their registered abstraction related water use.

In the event of consensus not being reached amongst water user sectors, Regional Offices or CMAs will go ahead with clearing in co-operation with those sectors that have agreed to



participate in the clearing process. The resultant additional water after taking the ecological reserve and reducing over allocation into account may be allocated to sectors that financially participated in the clearing project.

## 7. FUNDING OF WATER RESOURCE DEVELOPMENT AND USE OF WATERWORKS

**Water resource development and use of waterworks refer to the planning, design, construction, operation, maintenance, refurbishment and betterment (improvement) of Government water schemes and schemes to be funded by water management institutions like the TCTA and WUAs. If water use charges are too low, they will lead to underinvestment, over-consumption and unwarranted fiscal subsidies. There is therefore a need to adjust to higher real tariffs over time to accommodate the cost of investing in supply capacity to meet rising demand and to refurbish existing infrastructure.**

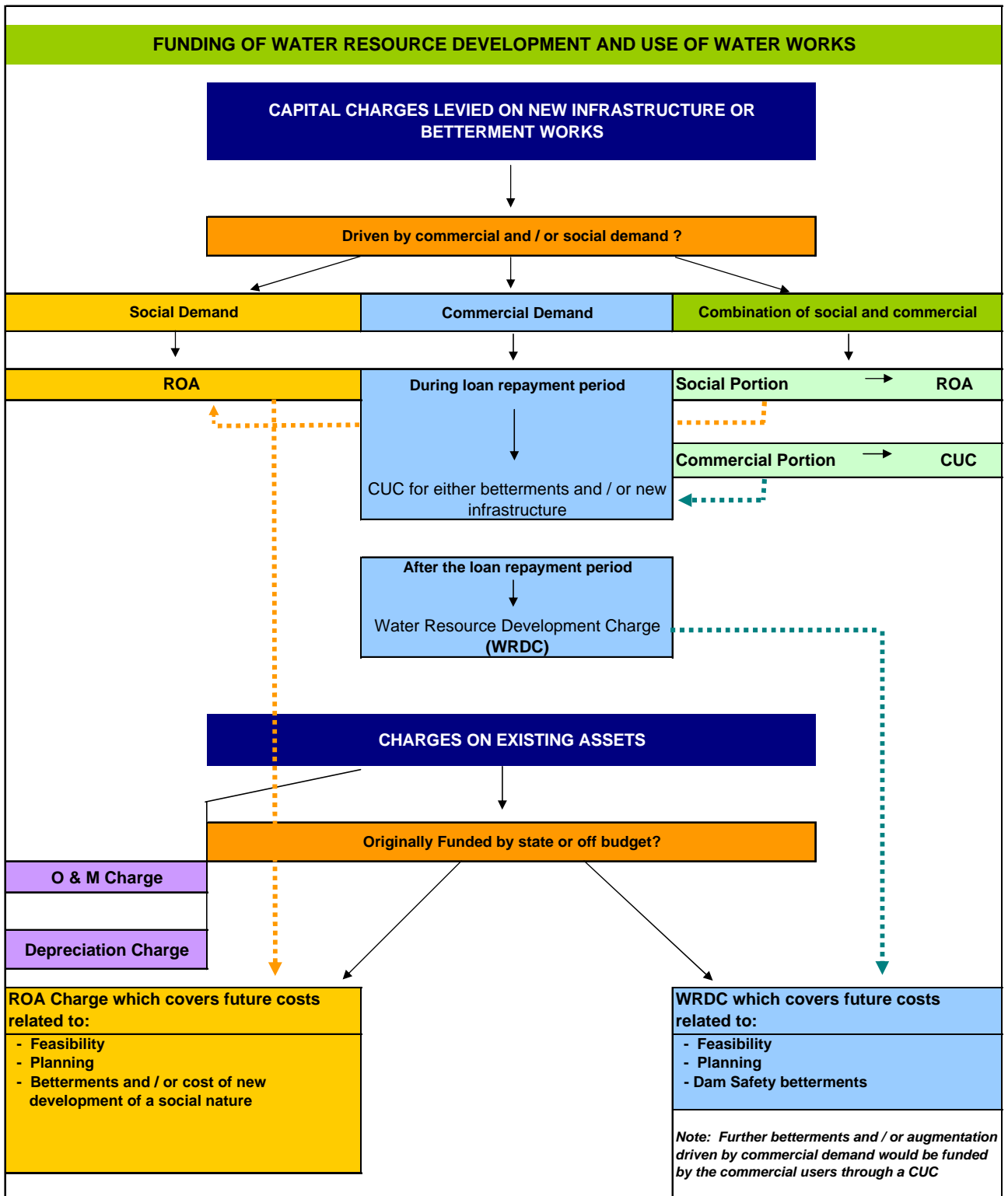
### 7.1 Government Waterworks

In terms of section 56 (2)(b) of the National Water Act, 1998, water resource development costs could include the related costs of investigation, planning design and construction of water schemes, **which constitute the capital cost of projects.** This revised pricing strategy utilises the **depreciation, return on assets (ROA) and off-budget funding** approach for setting charges to fund the capital cost in respect of development, refurbishment and betterment of schemes owned by Government. In recent times, given the budgetary constraints from National Treasury on large-scale water resource infrastructure development, the mechanism of off budget funding of commercially viable new water infrastructure by Funding and Implementing agents such as TCTA, has become accepted practice. The funding of these infrastructure developments requires loans, which naturally have certain repayment periods associated with them during which bulk water users must pay charges as per contractual agreement. **State funding will in the future be confined mostly to social water resource development or betterment projects, which conform to the purpose, set out in section 2 of the NWA, 1998 and where the demand is not driven by specific commercial water users or sectors.** Capital expenditure related to the promoting of equitable access to water, meeting current and future international obligations and dam safety betterments on State owned dams will qualify for State funding. New infrastructure development or betterment may have a social as well as a commercial component in which case State funding and related charges will apply on the social component, while loan funding and related charges will apply on the commercial component.

There may be instances when the state will develop water infrastructure in the expectation of promoting economic development. In these instances social users will be charged in terms of the policy for on-budget governmental funding, while a rate equivalent for off-budget funding will be negotiated with economic users. The classification of a project (social or commercial) will be at the sole discretion of the Minister of Water Affairs and Forestry.

The tables below show the charges that may apply for infrastructure funded under different circumstances.

<b>CHARGES TO BE LEVIED</b>	<b>EXISTING SCHEMES</b>	<b>NEW PROJECTS</b>		
	Historically funded by Exchequer or where off-budget debt has been repaid	Fully or partially funded by Government	Initially funded by Government and recouped from end users	Off-budget funding applied fully or partially
Operation and Maintenance	✓ (see 7.1.1)	✓ (see 7.1.1)	✓ (see 7.1.1)	✓ (see 7.1.1)
Depreciation	✓ (see 7.1.2)	✓ (see 7.1.2)	X	X
Refurbishment	X	X	✓ (see 7.1.2)	✓ (see 7.1.2)
Return on Assets	✓ (see 7.1.3)	✓ (see 7.1.3)	X	X
Water Resource Development	✓ (see 7.1.3)	X	X	X
Betterment	X (see 7.1.5)	x (see 7.1.5)	✓ (see 7.1.5)	✓ (see 7.1.5)
Capital Unit Charge	X	X	✓ (see 7.1.4)	✓ (see 7.1.4)



### 7.1.1 Operations and Maintenance

The operation and maintenance charge shall consist of the following:-

a) Direct costs:

Fixed and variable costs, which can be attributed directly to administrating, operating and maintaining schemes and include:

- Administrative costs
- Operating and maintenance costs (e.g. pumping cost, water weed control etc.)
- Distribution cost

Direct costs will be allocated directly to sectors where this is possible. The cost of joint works and operations will be shared on a volumetric basis.

b) Indirect cost:

These are the costs which cannot be directly attributed to a specific scheme, but which contribute towards the management of the water schemes of the entire area, and comprise of:

- Allocated regional office/utility cost
- Allocated area office cost

Indirect cost that has been allocated to the schemes will be further allocated to the different sectors in an equitable time-based manner.

Operation and Maintenance charges shall be recovered on a scheme or system basis. These charges (which include direct and indirect costs) can be recovered either on an actual cost recovery basis or through an Operations and Maintenance Tariff that is based on the forecast of annual O&M costs and of water use.

### 7.1.2 Depreciation/Refurbishment

**Depreciation is defined as the loss in functional performance and real term value of existing water resource infrastructure that occurs due to wear and tear, decay, inadequacy and obsolescence, not restored by current maintenance. This standard performance and capital value can only be restored through refurbishment. Examples are the replacement of pumps, sluice gates on dams, the concrete lining of a canal or a portion of a pipeline.**

For charge calculation purposes, depreciation is the systematic allocation of a depreciable amount of an asset over its useful life and will be applied as follows:-

- On a straight-line basis over the useful life of the assets.
- The depreciation amount = annual depreciable portion of the replacement value of assets.
- Replacement value = revaluation of the value of the assets as determined in March 2000 (full technical revaluation will be carried out at least every 10 years). In intervening years, desktop revaluation will be carried out annually which means that the PPI of April of each year will be applied to escalate the base value of the infrastructure assets, and thus the annual depreciation amounts, to nominal values.

Schemes are in various stages of depreciation and need refurbishment at different points in time. It is intended that through cost recovery, depreciation charges will be used to refurbish existing assets on a prioritised basis, as and when required. Depreciation income from the general revenue base will be used for the refurbishment of infrastructure assets from a dedicated refurbishment fund.

As refurbishment will only restore the original capital value of assets in real terms, no increases in charges will take place as a result of refurbishment. **On schemes funded off budget, the depreciation charge will only be applicable once the loans have been repaid. If refurbishment is required during the repayment period, a refurbishment charge will be arranged by agreement between the parties.**

The depreciable portion and useful life over which the asset will be depreciated are in accordance with the table below, which is subject to revision when the next engineering revaluation of assets is due.

<b>Component</b>	<b>Depreciable Portion (%)</b>	<b>Estimated Total Useful Life (years)</b>
Dams & Weirs	10	45
Canals	40	45
Tunnels	10	45
Pump Stations	40	30
Syphons & Concrete pipelines	30	45
Steel pipelines	75	30
Buildings	100	40

Calculation formula for annual depreciation cost (ADC):

$$\text{ADC} = \text{Replacement value} * \text{Depreciable portion\%/expected useful life}$$

The depreciation charge is applicable to all sectors supplied from Government waterworks.

### **7.1.3 Return on Assets (ROA)**

**This component of the charge reflects payment towards the development and betterment capital value of waterworks on government water schemes. It will be determined by fixing a charge to earn a specific rate of return on the current depreciated replacement value of the infrastructure.**

**ROA is based on the social opportunity cost of capital to government and this should approach a level sufficient to fund the annual capital expenditure budget requirement for the development of new social waterworks and betterment of existing infrastructure.**

In view of the off-budget funding arrangement for certain projects, the target level of income to be generated through ROA charges is directed towards recovering the annual capital cost requirement for State funded social projects.

An investigation of possible new social projects envisaged in terms of the National Water Resources Strategy and the capital required to fund dam safety betterments, revealed that the ROA rate of 4% laid down in terms of the 1999 Pricing Strategy and which was based on the estimated growth rate for industrial and domestic demands at the time, can

not be adjusted downward without seriously affecting the duration of the implementation programme. To cater for the estimated medium term demand for capital to be funded from the general revenue base, ROA will thus continue to be determined on a scheme or system related basis by applying a 4% rate to the State funded completion cost of new infrastructure or the depreciated replacement cost of existing infrastructure. The replacement and depreciation values will be based on engineering valuations, which were initially completed in March 2000, to be repeated within maximum intervals of 10 years. Between engineering valuations, the previous year's asset values will be inflated by the PPI of April each year to determine the nominal values of capital costs for pricing purposes. This is done to cater for the declining value of ROA over time in real terms due to depreciation and also to ensure that the value of assets over time will more closely reflect the actual replacement value when a technical revaluation is done.

The ROA charge is applicable on State funded and owned assets for as long as they exist in an operable condition. On off budget schemes, the ROA charge will not be imposed during the repayment periods of the loan to prevent too high a charge to water users.

While the National Water Act allows for a return on assets, it is intended that the ROA revenue will be applied to future development and betterment of capital projects on government water schemes. Given that the ROA charge is not applicable on off budget schemes while the loan is being repaid, there is likely to be a lack of funding available for the future development and betterment of off budget funded schemes. As stated in section 7.1.8 dealing with the treatment of reserve funds, ring fenced ROA revenue will be applied on a prioritised basis for meeting the cost of planning and feasibility of future augmentation or betterment of existing GWS and the development of social projects. The users licensed and charged for supplies from off budget schemes would thus also benefit in future from a ring fenced provision account for ROA. It will therefore be reasonable that these users also contribute towards the provision account through user charges.

In terms of Section 56 (2) (b) of the NWA, DWAF will be within its rights to raise funding from water users for water resource development and use of waterworks, including-

- (i) the cost of investigation and planning;
- (ii) the costs of design and construction; and
- (iii) the pre-financing of development

of new water infrastructure and in terms of section 56 (2) (c) to set charges for achieving the equitable and efficient allocation of water, which would reflect the scarcity value of water.

These elements will form a **Water Resource Development Charge (WRDC)** to be charged on off-budget schemes once the loan on such schemes has been repaid. Similar to State funded schemes the charge will be determined by earning a specific rate of return on DWAF's asset value for price-setting purposes of any fully paid up off-budget scheme and will be applicable for as long as such scheme is in operable use and/or the relevant water users are licensed. The asset value will be based on engineering valuation at the time that the loan has been repaid.

Cognisance will be taken of the fact that certain users have paid off loans associated to these schemes. For licensed water users who were subjected to off budget funding, the charge rate for this WRDC will be determined by the Minister of Water Affairs and

Forestry at the time when it becomes applicable (after loans are paid off) and will be applicable for all similar schemes. As a principle this rate will be less than the ROA rate on State funded schemes. For other water users licensed after the off budget debt has been repaid, the full ROA charge will be applicable.

The ROA charge is applicable to the following sectors supplied from government waterworks:

- Local Government (domestic)
- Industry
- Mining
- Strategic (Energy)
- Agriculture – only for new schemes

For the Agricultural sector, ROA charges as per the 1999 Pricing Strategy would not be applied to existing State irrigation schemes. These charges will also not be applicable to resource-poor farmers for existing schemes and new schemes constructed as part of the Water Allocation Reform programme. ROA will however be applicable for new government schemes constructed for established commercial farmers.

#### **7.1.4 Government schemes funded off budget**

Water management institutions such as the TCTA, which are directed by the Minister of Water Affairs and Forestry to implement and fund government water schemes off-budget, are entitled by the NWA to raise loans to finance the development of new water resource infrastructure, and should therefore be able to service these loans through cost recovery. The TCTA will be incorporated in the National Water Resource Infrastructure Agency (NWRIA), which will in due course take responsibility for developing and operating South Africa's national water resource infrastructure. The NWRIA has been approved by Cabinet and will be established through its own Act in Parliament. The TCTA or future NWRIA in consultation with stakeholders will on a project-by-project basis determine the extent of charges as determined by the proposed financial modelling. The primary charge will be the Capital Unit Charge (CUC).

In the interim before establishment of the NWRIA, the TCTA may enter into an implementation agreement with the Department of Water Affairs and Forestry ("DWAF") and DWAF may thereafter enter into a water supply agreement with the end-users. Consequently these agreements will be "back-to back" and serve the purpose of recording the rights and obligations of the parties in the implementation, financing and supply of water pertaining to the new government water work. In these instances, the TCTA will levy the CUC onto DWAF and DWAF will in turn levy the CUC onto the end-users. A cession may be signed between the parties whereby the CUC charge is paid directly to the water management institution.

In this scenario, when the project debt has been repaid, the project will attract all charges that are applicable to State funded schemes except for the ROA charges which will be replaced by the WRDC as explained above.

### **Guidelines for the CUC**

- A tariff is determined which will ensure that the debt on the project will be fully paid by the end user within a reasonable period of time. A reasonable period is usually determined as being between 18 to 25 years, taking cognisance of both end user affordability and future augmentation of a scheme.
- The reasonable period of time to repay the debt, which shall not be longer than the economic life of the asset, will be determined on the basis of:
  - The debt profile and acceptable growth and level of debt of the project;
  - Not allowing the debt of a project to overlap to an unreasonable extent with another project causing financial strain to end users or unhealthy financial balance in the water sector; and
  - The anticipated future funding requirements of the augmentation of the project.
- A tariff is calculated such that it is constant in real terms and grows with inflation, being CPIX, unless otherwise agreed to between the parties or any of the review triggers being applicable.
- A tariff may be phased-in during the construction period.
- Parties should endeavour not to capitalize interest after completion of construction. The terms by which interest will be capitalized will be included in the terms of the original binding contract , or alternatively a supplementary agreement, agreed to by all signatories to the original contract.
- The tariff will be based on water used from a scheme or system and not necessarily water provided into a scheme or system, which will enable water demand management, water restrictions etc.
- Phasing-in and step down of the tariff can be allowed for if it still facilitates end user affordability, provision for future augmentation will also be considered.
- Demand projections are used to determine a tariff which is reviewed annually taking account of changes in:
  - Water demand projections;
  - Real interest rate projections;
  - Inflation projections and/or
  - Cost of the scheme as well as cost and timing of future augmentation.
- From date of invoice amounts are payable to the water management institution within 30 days, unless otherwise agreed to between parties.

### **Review triggers of the CUC**

The CUC charge may contractually be subject to an annual review where increases are passed through automatically or under specific conditions negotiated between the parties. These conditions shall take into account but not be limited to the following factors:



- Changes in the yield of the system;
- Changes in macro economic projections;
- Changes in legislative charges;
- Changes in construction costs;
- Any revenue generated by the scheme other than the CUC and as agreed to by the parties to decrease the amount outstanding to repay the scheme;
- Changes in water use allocations and compulsory licensing; and
- The timing and cost of future schemes.

### 7.1.5 Betterments

**Betterment implies an improvement of existing water resource infrastructure resulting in an increased functional performance and/or real term capital value thereof. Examples are the raising of an existing dam to increase the yield, the enlargement of a canal to increase capacity and improving the stability of dams for safety purposes.**

Betterment of social projects will be funded through the ROA provision. After betterment is introduced, the real value of the asset will increase, resulting in an increased ROA amount for charge setting purposes.

For betterment of commercial driven projects using off-budget funding, the Minister of Water Affairs and Forestry or the water management institution may levy a betterment charge in consultation with the end-users post construction of the new water infrastructure. The charge may, at the discretion of the end-user, either be determined on an actual costs recovery basis or determined taking into consideration the need to smooth over time the impact of the charge if high capital costs have to be incurred to increase the availability of water or to maintain the assurance of supply.

The same principles of the CUC will apply in collecting revenue from the charge.

### 7.1.6 Methodology in determining unit cost

#### 7.1.6.1 Assurance of Supply (Section 56 (4)(b)(iii) of the Act)

The capital cost of multipurpose dams will be divided between sectors in proportion to the long-term estimated average annual sector use of allocations. Average sectoral use will reflect curtailment during water restrictions, thus taking into account the assurance of supply. The ROA and depreciation charges per sector will then be determined by using the divided **capital** cost allocations.

Unless scheme-specific assurance of supply is available, the long-term average annual use of the various user sectors will be considered to be the following percentage of allocations on government water schemes:

Sector	% of Sectoral allocation	Calculation of sectoral allocation %
Irrigation sector	91%	(100%@70%+70%@30% of the time)
Domestic, industrial and mining	97%	(100%@70%+90%@30% of the time)
Strategic industrial sector	100%	No water restrictions

- In the case of conveyance structures, the division of capital costs will be done in proportion to the required peak rates of supply to the various sectors.
- Percentages may be applied to determine the price differential on the CUC charges based on the Assurance of Supply.

The assurance of supply is applied as follows:-

- If for example a scheme has 100 million m<sup>3</sup> of available water per annum:
- If 30% is allocated to domestic and industry, (30 million m<sup>3</sup>) and the balance of 70% is allocated to agriculture, then the long term average use of allocations will be calculated as follows:-

Domestic & Industry	30 million m <sup>3</sup> x 0,97	29.1 million m <sup>3</sup>
Irrigation	70 million m <sup>3</sup> x 0,91	<u>63,7 million m<sup>3</sup></u>
Total		<u>92,8 million m<sup>3</sup></u>
Domestic and Industry allocation of cost will be	29,1 / 92,8	31.36%
Irrigation allocation of cost will be	63,7 / 92,8	<u>68,64%</u>
Total cost allocation		<u>100 %</u>

Under the current example, Domestic and Industry will pay a premium of 1.36% as a result of a greater assurance of supply while Irrigation will receive a discount of 1.36% as a result of a smaller assurance of supply.

#### **7.1.6.2 Consumptive charges on social projects**

A unit cost will represent the consumptive charges to be levied on existing and new social (Government funded) water schemes. Unit costs will be determined based on the annual sectoral cost allocations in respect of ROA (where applicable), Depreciation and Operation and Maintenance.

Unit costs will be based on the estimated water use but consumptive charges will be invoiced on actual measured or registered use.

On social projects where the long-term yield of the dams has not been fully allocated, consumptive charges will be based on the long-term yield, which implies a State subsidy.

On canal or pipeline scheme elements of social projects which are under utilised because full utilisation as planned could not materialise, the capacity of the canal/pipeline should be used as a basis for calculating charges.

Unless other arrangements are approved by DWAF, consumptive charges will be invoiced on a monthly basis for the domestic/industrial sector and bi-annually for the agricultural sector.

In order to promote water conservation and demand management, consumptive charges can consist of fixed and variable payments where agreements are concluded with user bodies.

### **7.1.7 Phasing in of consumptive charges**

#### **- Domestic/Industrial/Mining/Energy sector**

Annual increases for existing state funded schemes will be limited to 10%+ PPI (rate taken in April) until full cost recovery is reached. During the phasing in period, charges will not be reduced below the previous year's level, except in extraordinary circumstances, which would make a reduction inevitable.

#### **- Agricultural sector**

##### **• Established farmers**

- (a) Full Operation and Maintenance costs will be recovered annually, with an annual increase limited to 50%.
- (b) Depreciation charges for existing schemes will be capped at 1.5 cents per meter<sup>3</sup> plus PPI (rate) with 2007/08 as base year, with annual increase limited to 20% of the previous years charge.
- (c) Full financial cost recovery (including ROA) for new schemes.

##### **• Resource poor farmers**

- (a) Operation and maintenance charges will be phased in over five years from date of registration of the relevant water use.
- (b) Depreciation charges will be waived for five years from the date of registration of water use. Thereafter charges will be capped at 1.5 cent per meter<sup>3</sup> plus PPI (rate) with 2007/08 as base year, increases will be limited to 20% of the previous years charge.
- (c) Capital cost for new development will be subsidised by the fiscus.
- (d) Further waiving of charges will be considered for a limited time period on request by other relevant Departments, for example, where land and agricultural reform programmes are involved.

#### **- WUAs as Billing Agents**

As WUAs capacity develops, they may be used as billing agent for water charges. The timing of the transfer of responsibilities will be subject to an assessment by the Department of Water Affairs and Forestry.

### **7.1.8 Treatment of Reserve Funds**

The depreciation, return on assets and water resource development charges (WRDC) will result in reserve funds theoretically being managed by DWAF / NWRIA over time.

DWAF / NWRIA will only be in a position to finance capital cost requirements for refurbishment on specific schemes from its general depreciation charge revenue base and to finance the development of new social projects and betterment of existing projects from the general ROA and WRDC revenue base once a dedicated reserve fund has been put in place, from which capital expenditure can be made in a controlled manner.

When the above structures have been put in place the depreciation charge revenue may serve as a stabilization reserve for refurbishment whilst the ROA and WRDC income may serve as a provisioning reserve for betterment and development of social projects and could also be applied to dam safety betterments on existing schemes.

Use of depreciation funds will be prioritised in accordance with DWAF/NWRIA integrated water resource risk management systems.

As stated above, once a ring fenced provision account for ROA and WRDC has been established, this revenue will be applied to the funding of water resource development, prioritised as follows:

- (i) Planning and feasibility of future augmentation, (social or commercial projects),
- (ii) Betterment and/or development of social projects.
- (iii) Dam safety betterments on existing schemes (social or commercial).

Further cost such as those required for international obligations will be funded from the exchequer.

Prior to developing new water infrastructure projects, DWAF will assess the viability of undertaking a water conservation and demand management project as a cost effective alternative to developing new water infrastructure projects.

### **7.1.9 Water Supply Agreements**

DWAF/NWRIA shall enter into water supply agreements with major bulk raw water users and also with water boards, which have to enter into long-term water supply agreements with municipalities.

## **7.2 Schemes Owned by CMA's and WUA's**

Catchment management agencies and water user associations must, when determining their revenue requirements on which water use charges for development and use of waterworks are based, take into account the following:

- (a) recovery of overheads/management, operations and maintenance costs;
- (b) recovery of capital costs and the servicing of loans (water management institutions are entitled by the Act to raise loans to finance new water supply infrastructure, and should therefore be able to service these loans through cost recovery);
- (c) reasonable provision for the depreciation of assets, which can be placed in a reserve fund for utilisation at the appropriate time for refurbishment;
- (d) other charges levied by law on the institution and in terms of this pricing strategy; and
- (e) the financial targets included in its business plan.

Charges levied by water management institutions may be levied on a proportional or differential basis, depending on the relevant constitution, or if directed so by the Minister to give effect to the provisions regarding the rendering of financial assistance in terms of the NWA.

## **8. ECONOMIC CHARGES (S56 (2) (c))**

The economic charge will support the objective of economic efficiency as covered under chapter 3 in providing an incentive to shift water use from low to high values. The economic charge can be set only by DWAF, on a scheme or system related basis and the revenue would accrue to Treasury.

There are two methods of setting the charge, i.e.:-

- administratively by determining a proxy for the economic value of water, or
- via market-orientated mechanisms.

- **Administrative mechanisms**

The administratively determined charge can be used in water stressed catchments to provide an incentive for existing users to increase economic efficiency. The administratively determined charge will be based on the opportunity cost of water as determined by prevailing trading transactions but will be capped to the level of the return on assets charge for the relevant scheme or system. This implies that only water users not charged for ROA or CUC may be subjected to this charge.

Since the pricing strategy introduced financial charges will go a long way towards improving the efficient allocation of water, the administratively set economic charge will not be introduced before compulsory licensing is implemented, and then only after consulting the relevant stakeholders and water management institutions. This annual charge will be an add on to any charges levied for water resource management, depreciation and use of waterworks.

- **Market-orientated mechanisms**

Where amounts of water are still available for allocation after compulsory licenses have been issued, and there is competition for using this water, the public auction procedure may be followed. The price established in this manner will be based on market clearance principles by allowing applicants to take up the entire available supply through a bidding or tendering process. Before introducing this process, a regulation must be developed in accordance with section 26(1)(n) of the NWA.

Another market-orientated mechanism, which is already in place, is the transfer of water use entitlements via trading transactions in terms of Section 25(2) of the NWA. A procedural guideline has been developed to facilitate trading within and between water use sectors. This may obviate the need of setting economic charges administratively in water-stressed catchments.

## 9. THE WASTE DISCHARGE CHARGE SYSTEM

During the consultation process of the pricing strategy document, stakeholders had an opportunity to fully comment on sections of the Pricing Strategy dealing with the Waste Discharge Charge System (WDCS), which included chapters on:

- The Basis for the Waste Discharge Charge System, the
- Incentive Charge, and the
- Mitigation Charge

The WDCS will be included as an extension to this pricing strategy only once certain Amendments to the NWA are approved by Parliament.

Once the amendment to the Act is approved, no further formal consultation of the WDCS will take place as the process of consultation took place when this strategy was Gazetted for public comment on 1 July 2005 under Notice 1045 of 2005, Gazette No. 27732.

## 10. APPLICATION OF PRICING STRATEGY TO DIFFERENT CATEGORIES OF WATER USE / USER SECTORS

Section 56 of the National Water Act, 1998 also provides for the pricing strategy to differentiate on an equitable basis between-

- different types of geographic areas (**S 56 (3) (a) (i)**)
- different categories of water use (**S 56 (3) (a) (ii)**); and
- different water users (**S 56 (3) (a) (iii)**).

Section 56 (6) (c) of the Act provides that in setting a pricing strategy for water use charges, the Minister must consider measures necessary to support the establishment of tariffs by water services authorities in terms of section 10 of the Water Service Act, 1997 and the use of lifeline tariffs and progressive block tariffs.

In terms of this pricing strategy for raw water use charges, the above requirement will not be accomplished by providing the raw water requirement for basic human needs (defined as the essential needs for drinking, food preparation and personal hygiene which is put at 25 litres per capita per day) free of charge to water services authorities, but through Equity Share Grants made in terms of the annually enacted Division of Revenue Act.

### 10.1 Impact of Raw Water Pricing Strategy on Different User Sectors

SECTOR	RESOURCE MANAGEMENT CHARGES	RESOURCE DEVELOPMENT CHARGES	PHASING IN OF CHARGES
Domestic/Industrial	<ul style="list-style-type: none"> <li>• Full cost recovery on abstraction and waste discharge related use</li> </ul>	<ul style="list-style-type: none"> <li>• On-budget GWS: Depreciation; ROA: O&amp;M</li> <li>• Off-budget GWS: CUC, Refurbishment, WRD and O&amp;M</li> <li>• WMI's: Full cost</li> </ul>	<ul style="list-style-type: none"> <li>• WRM charges introduced fully after registration of water use in WMA</li> <li>• Waste discharge related WRM charges to be implemented after registration of waste</li> </ul>

SECTOR	RESOURCE MANAGEMENT CHARGES	RESOURCE DEVELOPMENT CHARGES	PHASING IN OF CHARGES
		recovery	users. <ul style="list-style-type: none"> <li>Annual increase on development charge will be limited to PPI + 10% until target development charge is achieved on state funded GWS.</li> </ul>
<b>Stream Flow Reduction Activities <u>Commercial growers</u></b>	Full recovery of allocated costs. <b>Note: Cost of Dam Safety Control and waste discharge related costs not allocated to the forestry sector.</b>	Not applicable, except where negotiated for new development.	WRM charges introduced fully after registration but capped to R10 per ha plus PPI with 2002/03 as base year.
<b>Stream Flow Reduction Activities <u>Resource poor growers</u></b>	Full recovery of allocated costs to be achieved in 5 years. <b>Note: Cost of Dam Safety Control and waste discharge related costs not allocated to the forestry sector.</b>	Not applicable, except where negotiated for new development	As above, but subsidised for 5 years from date of registration. Subsidy starts at 100% and reduces by 20% annually. No charge for forest plantation that is <= 10 hectares.
<b>Irrigation <u>Commercial farmers</u></b>	<ul style="list-style-type: none"> <li>Full recovery of allocated costs</li> <li>Waste discharge related costs not applicable</li> </ul>	<b>GWS:</b> <ul style="list-style-type: none"> <li>Full recovery of Depreciation plus O&amp;M on existing schemes.</li> <li>Full financial cost recovery for new schemes.</li> </ul> <b>WMI:</b> <ul style="list-style-type: none"> <li>Full financial cost recovery</li> </ul>	<ul style="list-style-type: none"> <li>Depreciation charge capped to 1.5 c/m<sup>3</sup> plus PPI from 2007/08.</li> <li>WRM charge introduced fully after registration of water use in WMA, but capped to 1.5 c/m<sup>3</sup> plus PPI from 2007/08.</li> <li>O&amp;M cost increases limited to 50% p.a.</li> </ul>
<b>Irrigation <u>Resource poor farmers</u></b>	<ul style="list-style-type: none"> <li>As above, but subsidised for a 5-year period.</li> <li>Waste discharge related costs not applicable</li> </ul>	<b>GWS:</b> <ul style="list-style-type: none"> <li>O&amp;M subsidised for a 5-year period on existing and new schemes.</li> <li>Depreciation charges waived for a 5-year period.</li> </ul> <b>WMIs:</b> <ul style="list-style-type: none"> <li>Subsidies available under certain conditions.</li> </ul>	<b>GWS:</b> <ul style="list-style-type: none"> <li>O&amp;M charges phased in over 5 years after registration at 20% per annum. 0% in the first year.</li> <li>Depreciation charge applied from year 6 onwards and capped to 1.5 c/m<sup>3</sup> plus PPI from 2007/08.</li> <li>WRM charges phased in over 5 years @ 20% per annum. 0% in year one.</li> </ul>

## 10.2 Natural Disasters

Section 56 (3) (e) of the National Water Act allows the Minister to provide on an equitable basis for some elements of the charges to be waived in respect of specific users for a specified period of time.

In addition to the support offered hereunder, any relief offered by other government departments at the time of the natural disaster could also be applied to offset further water charges.

### **10.2..1 Forest fires and floods**

In the event of forest fires or floods, when water resources are not in use as a result of damages caused, the Minister may apply her/his mind to grant some form of relief to affected users and will consider and may apply all or some of the following in determining support:-

- The extent of damage to crops.
- The relief **will in all cases** be limited to the actual Water Resource Management charges.
- Water Resource management charges **could** be fully or partially waived.
- Charges waived will be for a fixed period of time.
- **Under no circumstances will** cash grants be provided as relief.

### **10.2..2 Droughts**

During times of droughts when it is necessary to curtail entitlements, the following rules will apply when water restrictions are imposed by the Department on established and emerging farmers on existing Government Water Schemes.

In schemes where the actual available supply is:

- greater than or equal to 70% of the irrigation quota, full charges will apply,
- between 69% and 50% of the irrigation quota, charges will be limited to the WRM charges and the O&M charges, while the Depreciation charges will be waived,
- between 49% and 30% of the irrigation quota, charges will be limited to the WRM charges and 30% of the O&M charges, implying that the Depreciation charges will be waived and a discount of 70% will apply to O&M charges,
- between 29% and 0%, of the irrigation quota, charges will be limited to the WRM charges, implying that the depreciation and the O&M charges will not apply.
- CMA's and WUA's must approach DWAF with a motivation for drought relief.

### **10.2..3 Purchase of "extra water"**

The policy of allowing scheduled irrigators on Government water schemes to purchase "extra water" under certain conditions at heavily subsidized prices will be discontinued. Only under exceptional circumstance, such as an unexpected heat wave, may irrigators be allowed to purchase additional water over and above the quotas. The tariff for such extra water will be the raw water tariff for domestic and industrial supply.

### **10.2..4 Interest on arrear water charges**

Arrear water charges will attract interest at rates determined by the Minister from time to time.



## **11. TRANSPARENCY AND ACCOUNTABILITY**

In establishing the pricing strategy, every attempt will be made to control costs by the application of sound financial management principles such as strict budgetary control. The revised pricing strategy embraces the principle of transparency, which of itself should promote cost control. In terms of this principle, the forthcoming year's sectoral charges that are developed during the budgetary process for each water management area will be forwarded to regional offices for dissemination and discussion with interested parties. Final sectoral charges will then be formalised and disseminated through the accounts receivable system to the water users prior to the commencement of the financial year.

## **12. IMPLEMENTATION DATE**

This Pricing Strategy was gazetted for public comments on 1 July 2005. As required by the NWA, a period of 90 days was allowed for comments, where comments received were considered to enhance the Pricing Strategy, they were included in the final document. The Department wishes to thank all participating individuals and organisations for their valuable inputs in shaping this revised Pricing Strategy.

In order to implement chapter 6.4, dealing with the water resource management component of waste discharge related water use, DWAF will have to formally define the resource quality objectives and also register waste discharges onto the WARMS system. It will therefore not be practical to implement this strategy in its totality until the required support systems are in place. For the 2007/8 price setting year starting in April 2007, DWAF will implement the new pricing strategy in as far as the Water Resource Development and Use of Waterworks (consumptive) charges are concerned, while the rest of the price setting process will be implemented in terms of the 1999 Pricing Strategy. The balance of this pricing strategy will then come into force as soon as the required systems are in place for its effective implementation.

## **ANNEXURE A**

**Government Gazette No. 29697 36**

**Date: 16 March 2007**

**No. 209**

### **WATER RESEARCH COMMISSION**

**16 March 2007**

**WATER RESEARCH ACT (Act No. 34 of 1971)**

### **ESTABLISHMENT OF A COLLECTION STRATEGY FOR WATER-RESEARCH CHARGES IN TERMS OF SECTION 11 OF THE WATER RESEARCH ACT, 1971**

I, Lindiwe Benedicta Hendricks, MP, Minister of Water Affairs and Forestry, with the concurrence of the Minister of Finance, hereby in terms of Section 11 of the Water Research Act (Act No. 34 of 1971), establish a collection strategy for water-research charges, as contained in the schedule hereto.

#### **SCHEDULE**

#### **A COLLECTION STRATEGY FOR WATER-RESEARCH CHARGES**

##### **PREFACE**

The Water Research Act (WRA), Act No. 34 of 1971, gives power to the Minister, with the concurrence of the Ministry of Finance, from time to time by notice in the Gazette, to set tariffs in respect of water research charges levied on quantities of water supplied, or made available for use, for various purposes. The charges are paid into a national Water Research Fund and used by the Water Research Commission (WRC) to fund water-centred Research and Development (R&D) on behalf of the nation.

Historically, tariffs relating to water research charges have been reviewed on an annual basis, and adjusted, when necessary, taking into account the R&D needs of the water sector and the rate of inflation. It was accepted that, as from 2004, the 2003/04 tariffs would form a baseline for the ensuing five years and annual tariff increases would be in accordance with the rate of inflation, by notice in the Gazette. Charges are currently based on volumes of water supplied and on irrigated land area. In terms of the WRA, the Department of Water Affairs and Forestry (DWAF) is obliged to collect water research charges on behalf of the WRC, unless the Minister approves otherwise.

Owing to various developments, the WRC has been required to review current practice and develop a new collection strategy, as presented here. The main developments that necessitate the change include:

- The establishment of a pricing strategy for water use charges in terms of Section 56(1) of the National Water Act (Act No 36 of 1998)
- Definitions of water use in Section 21 of the National Water Act
- The implementation of the Municipal Finance Management Act
- Developments to DWAF's computer-based system (SAP/WARMS) for registration and licensing of water use

- Arrangements for the collection of water use charges by DWAF.

Although none of the above-mentioned developments refer directly to water research charges levied in terms of the WRA, they all strongly affect the collection of water research charges by DWAF. DWAF's obligation to continue to collect such charges on behalf of the WRC necessitates a close link to the pricing strategy for water use charges in the interests of efficiency and effectiveness. In practice this means that a common user base will have to be identified and uniform-billing arrangements adopted. However, it should be noted that the setting of water research charges remains independent of changes in water use charges governed by the NWA pricing strategy.

This document sets the strategy for linking the collection of water research charges to the pricing strategy for water use charges, whilst maintaining compliance with the requirements of the Water Research Act.

**Lindiwe Benedicta Hendricks, MP**  
Minister of Water Affairs and Forestry

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## **ABBREVIATIONS**

CMA	=	Catchment Management Agencies
DWAF	=	Department of Water Affairs and Forestry
NWA	=	National Water Act, 1998
WMA	=	Water Management Area
WRA	=	Water Research Act, 1971
WRC	=	Water Research Commission

## **1. INTRODUCTION**

This Collection Strategy contains the objectives, methodology and implementation strategy for setting and collection of water research charges for purposes of funding water-centred Research and Development (R&D) on behalf of the South African water sector and the nation.

One of the key objectives of the collection strategy is to maintain levels of charges consistent with efficient and effective generation, dissemination and use of knowledge products required to sustainably manage South Africa's water resources, effectively deliver water services to all citizens and efficiently and beneficially use our limited water supplies.

DWAF has the obligation to continue to collect water-research charges on behalf of the WRC. In the interests of efficiency and effectiveness with regard to the collection of these charges, revision of the mode of collection is necessary to build a close link to the collection of water use charges as determined by the NWA pricing strategy. In practice this means that a common user base will have to be identified and uniform-billing arrangements adopted.

This document sets the strategy for linking the collection of water research charges to the pricing strategy for water use charges, whilst maintaining compliance with the requirements of the Water Research Act.

## **2. LEGAL MANDATE TO THE PRICING STRATEGY**

In terms of Section 11 of the WRA, the Minister may with the concurrence of the Minister of Finance, from time to time by notice in the Gazette, establish tariffs for water research charges on the basis of water supplied or made available for domestic, industrial or agricultural uses.

## **3. IMPLEMENTATION OF THE WATER-RESEARCH CHARGE COLLECTION STRATEGY**

### **3.1 Definition of Water Use**

Section 11 of the WRA empowers the Minister of Water Affairs and Forestry to levy charges on water supplied or made available for use for agricultural purposes, urban purposes, industrial purposes or any other purposes by any water management institution. At the same time, the Minister may, in respect of the tariff pertaining to such charges, differentiate between different classes of use or user, and may absolve any particular use or user from liability for payment. The Act therefore gives the Minister wide discretionary powers to determine the user base liable for payment of water research charges.

In selecting the user base for the levying of water research charges, and bearing in mind the need to ensure compatibility with the user base liable for payment of water use charges, consideration is given to the definition of water use contained in Section 21 of the NWA. These water uses are given as:

- (a) taking water from a water resource;
- (b) storing water
- (c) impeding or diverting the flow in a watercourse;
- (d) engaging in steam flow reduction activity;
- (e) engaging in controlled activity which has a detrimental impact on water resources;
- (f) discharging waste or water containing waste into a water resource;
- (g) disposing of waste in a manner which may detrimentally impact on a water resource;
- (h) disposing of water which contains waste from any industrial or power generation process;
- (i) altering the bed, banks, course or characteristics of a watercourse;
- (j) removing, discharging or disposing of water found underground for continuation of an activity;
- (k) using water for recreational purposes.

The above-mentioned water uses can be broadly grouped under three categories in the NWA:

**Abstraction-related uses**

- Section 21 (a), Section 21 (b) and Section 21 (d)

**Waste discharge-related uses**

- Section 21 (e), Section 21 (f), Section 21 (g), Section 21 (h) and Section 21 (j)

**Non-consumptive uses**

- Section 21 (c), Section 21 (e), Section 21 (i), Section 21 (j) and Section 21 (k)

The broad definition of water use in the NWA creates the option of including most, if not all, of the above-mentioned uses in the group which is liable for payment of water-research charges in terms of the WRA.

### **3.2 Collection Strategy for Water-Research Charges**

Although the WRA allows for the inclusion of most of the above user categories in the group liable for payment of water-research charges, the collection strategy for water-research charges will initially focus on the same user group currently (in 2004) contributing towards water-research charges, i.e. those falling in the abstraction-related use category. This includes users of water for domestic, municipal, industrial and irrigation purposes. If need be, the levying of charges on any water use that is not addressed by the current WRA will be subject to an appropriate amendment of the Act.

Payment of water research charges in the case of urban, domestic and industrial uses is currently based on quantities of water supplied. However, in the case of irrigation, where much of the water supplied has not been metered, the WRA allows charges (rates) to be

levied on the area (hectares) of scheduled irrigation land on Government water schemes and schemes falling under Irrigation Boards. The WRA also makes provision for the levying of charges for water made available for all abstraction-related uses, thus providing for the change in the basis of collection of water-research charges, which will allow a simple link to the collection of water use charges under the NWA pricing strategy.

**A fundamental aspect of this water-research charge collection strategy is therefore the phasing out of payment of water research rates and charges on the basis of water supplied (for domestic and industrial purposes) and for irrigated land, and the simultaneous phasing-in, for all water uses (irrigation included), of payment on the basis of registered or licensed water use.**

Although the basis for levying of water-research charges will be changed, the new collection strategy aims to avoid any increase in charges for the various user groups. The underpinning principle is that in converting from ‘water supplied’ to ‘water made available’ as the basis for payment, every effort will be made to ensure that equivalent prices (tariffs) apply. This includes the land-area-based to water-volume-based conversion in the case of the water-research charge for which irrigation is liable.

It should be noted that a previous decision to accept 2003/04 tariffs as a baseline and to link annual tariff increases to the rate of inflation for the ensuing five years will be honoured, provided that national policy does not require a broadening of scope, or intensification, of water research, in which case an amendment of this strategy will be required.

### **3.3 Determination of Sectoral Water-Research Charges**

#### **3.3.1 Water use sectors**

The user sectors for which unit sectoral water research charges will initially be levied are:

- Domestic/industrial (water services authorities, industrial, mining/energy)
- Agriculture (irrigation and intensive stock watering) on Government water schemes and Irrigation Boards/WUA schemes.

In time, other users and user sectors will be included, but not without prior consultation with user groups and other interested and affected parties.

#### **3.3.2 Determination of registered water use volumes per sector for pricing purposes**

The registered water use in the various sectors must reflect average volumes annually available as determined by using the following methodologies for the water uses as defined:

##### **Domestic/Industrial**

Water allocations as reflected on a lawful permit, general authorisation or licence and/or verified as

existing lawful use, and amended for assurance of supply.

### **Irrigation**

Irrigation quotas, amended for assurance of supply.

Adjustments to the volumes as determined above may be deemed necessary according to the level of under- or over-utilisation of water in a particular WMA. Should this apply, all adjustments will be done in strict compliance with rules laid down in the NWA.

#### **3.3.3 Assurance of supply**

Registered water use of various users takes into account the assurance of water availability or supply, according to rules laid down in the pricing strategy for water use charges.

#### **3.3.4 Water-research charges for resource-poor irrigators**

Resource-poor irrigation farmers will be exempt from the payment of water-research charges for an initial introductory period of five years or as otherwise negotiated.

#### **3.3.5 Phasing in of water-research charges**

The phasing-in of water-research charges based on registered water use will take place concurrently with the phasing-in, in terms of the NWA pricing strategy, of water-use charges in the various WMAs by the relevant water management institutions. Prior to that, the current practice, of levying charges on water provided and rates on listed irrigation land, will remain in force.

#### **3.3.6 Tariffs relating to water-research charges**

The Minister from time to time sets tariffs applicable to water-research charges by notice in the Gazette. (The most recent such notice was No. 249 in the Government Gazette of 24 March 2005).

#### **3.3.7 Differentiation and temporary relief with respect to payment of water-research charges**

Section 56 of the National Water Act, 1998 provides for the pricing strategy for water-use charges to differentiate on an equitable basis between

- different types of geographic areas
- different categories of water use
- different water users,

or for some elements of the charges to be waived in respect of specific users for a specified period of time.

In terms of the WRA, the Minister has similar powers, which allow the pricing strategy for water-research charges to be consistent with the NWA pricing strategy in this regard.

#### **4. COMMISSION FOR COLLECTION OF WATER-RESEARCH CHARGES**

DWAF shall continue to be responsible for collecting charges from the relevant water management institutions and for paying these over to the WRC in accordance to the WRA, for which service the WRC will pay DWAF a commission.

#### **5. BUDGETARY AND FINANCIAL CONTROL**

In implementing the water-research collection strategy, every attempt will be made to collect revenue efficiently and maintain strict financial control. In terms of this principle, a budgetary process will be applied in each water management area. Budgets will be forwarded to regional offices for dissemination and discussion with interested parties. Full disclosure of the accounts of the WRC will be made and outcomes of the R&D funding process will be communicated to water users.



## ANNEXURE B

### GLOSSARY OF TERMS

**Social equity:** In the context of water resources, social equity implies that all user groups have fair and reasonable access to the nation's scarce water resources, and that the allocation of water resources facilitates universal and affordable access to a basic water supply.

**Ecological sustainability:** This concept captures the view that there is a need to treat ecological protection and continuing economic growth as mutually compatible rather than as necessarily conflicting objectives.

**Economic efficiency:** A condition that is achieved when resources are used over a given period of time in such a way as to make it impossible to increase the welfare of any person without harming another.

**Economic value:** The cost that represents the scarcity value of a good that would prevail in competitive markets.

**Externalities:** are essentially activities whose full cost or benefit is not incorporated into an economic decision; hence they lead to sub-optimal social allocation.

**Market approach:** This is an accepted means through which buyers and sellers can communicate and trade at mutually agreed terms.

**Market clearance:** A condition that is attained when the price of the good traded adjusts so that the quantity buyers wish to buy is equal to the quantity which sellers wish to supply.

**Opportunity costs:** The costs of alternatives forgone by using scarce resources in a particular manner.

**Polluter pays principle:** A principle that ensures that a charge per unit of pollution emitted into the ecosystem is charged to those responsible for such pollution in order to internalise the cost thereof.

**Resource Poor Farmers/Forest growers:** Entry-level water users who are citizens of South Africa and who are members of the historically disadvantaged population groups.

**Scarcity:** The situation which arises when demand for any given good outstrips the supply of that good.

**SAPWAT:** A software program providing a crop water requirement model for South Africa.