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Our Reference: NWRS PPC

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15 October 2012

Hon Adv de Lange
Chairperson: Portfolio Committee on Water and Environment
Parliament of the Republic of South Africa
PO Box 15
Cape Town
8000

Dear Honourable de Lange,

**Re: The WRC comments on the National Water Resources Strategy
(2012)**

The Water Research Commission (WRC) wishes to express its gratitude to you and the portfolio committee on Water and the Environment for the opportunity to offer the WRC's comments on this all important strategy document. We are also convinced that your initiative to enhance this blueprint for the development, management and sustainable use of South Africa's water resources for the improvement of the quality of life of people in South Africa and her neighbours while concomitantly contributing actively to South Africa's economic growth and international competitiveness through a public hearings process, will greatly enhance the draft into a much more robust final strategy.



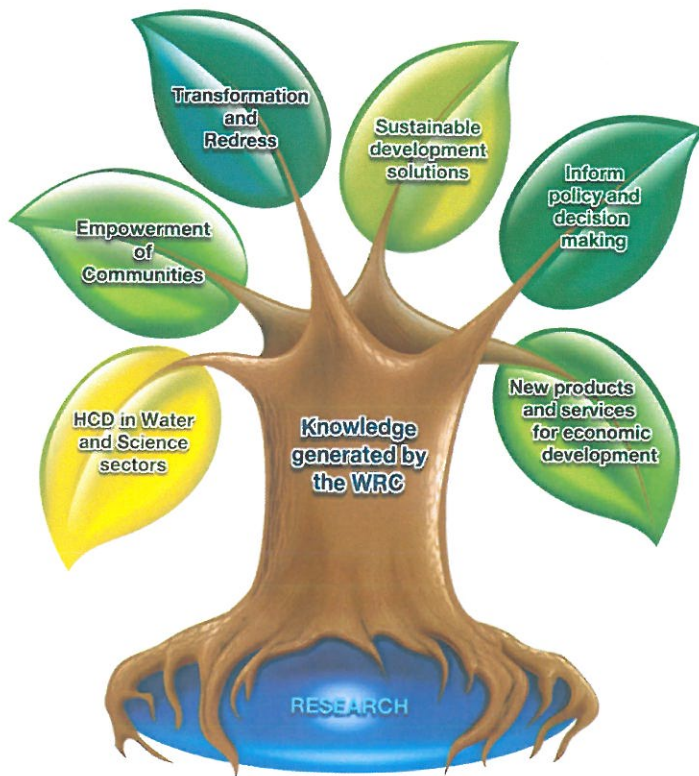


Figure 1. The WRC Knowledge Tree

The WRC has since its inception in 1971 been a primary research and development partner to the South African water sector and the Department of Water Affairs. In recent time it has become much more robust in the interpretation of its mandate to include matters of human capital development for the water knowledge sector, the national sustainable development agenda, converting water knowledge into tangible products and services for the economy, the empowerment of communities through research participation, training and entrepreneur development and playing an active part in the national transformation project. These are captured in the core concept of the WRC's new five year strategy viz. the WRC Knowledge Tree (above). This new strategy will enable the WRC to be an even more direct contributor to the successful implementation of the NWRS, the water services strategies as well as the sanitation strategies.

Comments on the draft NWRS

We would like to begin by congratulating the department and the drafting teams on a good document. While there are many aspects of the strategy that need to be debated and possibly amended, we have before us a very good straw-dog from which to proceed.

The NWRS is phrased as a combination of a classical NWRS and parts of a water services strategy.

In the absence of an equivalent of NWRS for water services, the WRC is of the view that this is an important intervention to deal with a market failure in this domain. We believe that the fact that the document reads a little like a Water Management Strategy as opposed to a more traditional NWRS is useful at this time for both the reason stated above as well as for the contextualization of the NWRS. Perhaps in the future the NWRS and a national water services and sanitation plan will both form separate components of a National Water Management Strategy.

The current document does not enunciate a sorely needed structured approach to the issues of research and development, knowledge management and human capital development.

The WRC suggests that due consideration be given to the concept of a Water Research and Development Strategy Framework as a key subsidiary document to the NWRS. We would like to offer for consideration the following contribution to the chapter that engages this matter:

"The critical success factor for the complete implementation of the NWRS is the potentiation and roll-out of a robust water research and development strategy/agenda. The nature of South Africa's water challenges dictate that there is a dire need for new knowledge solutions, innovations, technologies and know-how as well as high level skills in order to be successfully and gainfully addressed. The R&D strategy/agenda will cover the length of the Innovation Value Chain. This will include portfolios of basic or fundamental research; applied research; innovation and technology development; and finally demonstration, commercialization and proliferations of products and solutions. It is also important to cover the breadth of research and development disciplines with the inclusion of social sciences, economics, natural sciences and engineering. It is also important that the R&D Agenda is developed with a wide stakeholder participation of all major groups. Phase 1 in this NWRS period will be the development of a National Water Research and Development Strategy Framework led by a partnership of the DWA, DST, WRC and the major stakeholders. The Second phase will be the implementation roll-out with the WRC as the national steering and funding research institution acting as the coordinator of the strategy implementation on behalf of the DWA.

Box 1 Proposed core principles of the Strategy Framework

- The R&D agenda must be both locally relevant as well as produce opportunities for South Africa to achieve global research leadership in certain domains.
- Research concentration and the development of critical mass in key water R&D areas.
- The research agenda must be oriented to a ready realisation of products, services and know-how that can contribute to practical solutions to the SA water challenge and directly contribute to socio-economic growth in a sustainable development paradigm where-ever possible.
- The projects supported in the strategy must all be vehicles for the development of higher education levels of human capital in both the water and science sectors.
- The knowledge derived must inform policy development and strategic decision making at all levels.
- The empowerment of communities must inform the design of the R&D projects.
- The Water R&D Strategy must take forward the national Transformation and Redress Project.

Some of the current 'hotspots' to engage with higher research and development investment would include areas of national challenges as well as areas of global opportunity. The former would include the development of more innovative mechanisms for access to safe water and sanitation solutions to all who live in South Africa. A second would be addressing the country's water supply challenge through the examination of the One-Water concept – facilitating the development of knowledge and technologies that will allow South Africa to rely on a variety of faucets for its water supply. These faucets would include the naturally occurring resource (surface and groundwater), appropriate treatment of wastewater and desalination. The mechanisms of resource development through storage and transfer as well as improved mechanisms for conservation and demand management will be key in these areas. A third area would involve mechanisms for international water management. The global opportunity available for South Africa in this domain is the management of the water resource in the wake of climate change. South Africa has two points of advantage in this domain. The first is the possibility of leadership, together with other South partners, of adaptation and mitigation solutions for the water challenges in the developing world. The second is the unique climatic position of South Africa – the meeting point of three oceans and a climate variability across the country that represents some of the major climate domains in the world from tropical/sub-tropical to semi-desert which make South Africa a special global mimicry laboratory for climate change. This should be used innovatively. The last point to make is that the water resources research and development agenda must also include the examination of important bridges. These include the nexus between water resources and water services in an Integrated Water Resource Management paradigm; the water-energy relationship in both directions viz. water in energy

production as well as energy use in water provision and water treatment; water and food security; and water for environmental and ecological well-being. "

The water economics and allocations priorities chapter would gain from being phrased in a more nuanced manner with more link points to the envisaged detailed plans.

The water economics section will be underpinned by a small raft of sub-strategies on how to achieve the principles laid out. The NWRS will benefit enormously by the naming of those policies and sub-strategies with approximate timeframes of realisation. The phrasing of the allocation priorities represents a deeper problem, but has perhaps an easier solution. The principles laid out are indeed very sound, but there are two challenges. The first is that Priority 3 "water for poverty eradication" needs a robust and undisputable definition especially since this is an addition when compared to NWRS 1. The second problem is that the priorities are phrased as an automatic linear sequence which leaves the possibility of a linear stock-flow interpretation viz. meet n completely before proceeding to $n+1$ and continue accordingly until $n+i$. This is clearly not what is intended as there will be a highly sophisticated discussion at all levels on the water allocation local to catchment to national with many time bound compromises and deviations from this linearity. The NWRS 2 should be explicit in this regard. Further, one would expect the terms of water vulnerability and scarcity to be side by side with that of water security. This must be particularly true in South Africa where we have a dichotomy and the experiences of water security differ amongst groups. The emphasis on equity may well resolve this challenge, together with the notion of water security aligned to scarcity of water. The WRC has completed some exploratory action orientated research in unpacking these concepts and these outcomes are of important relevance to equity in allocation and use.

The NWRS should use the opportunity to entrench the notion of polluted waters as a resource.

The NWRS 2 rightly states that fresh water and its development are approaching its limits. Water reuse¹ was mentioned in NWRS 1 and since then the previous Minister requested a National Strategy for Water Reuse, which is being drafted. But this and the National Strategy for Desalination are not included in the list of germane strategies in NWRS 2. The focus on used water (wastewater) including mine water (which in turn includes acid mine drainage or AMD) consistently takes the perspective that such waters present only problems rather than opportunities. South Africa has limited fresh water resources and has been defined as water stressed by international standards². The reuse of water in South Africa accounts for approximately 14% of total water use, and return flows account for a large

¹ Reuse is defined as 'utilisation of treated or untreated wastewater for a process other than the one that generated it, i.e. it involves a change of user. For instance, the reuse of municipal wastewater for agricultural irrigation'.

² Water Re-use, An International Survey of Current Practice, Issues and Needs. Editors Blanca Jimenez and Takashi Asano. IWA Publishing. 2008.

part of water available for use from some of the important river systems³. The NWRS 1 identifies water reuse as one of a number of important strategies to balance water availability with water requirements in future and the extent of water re-use in South Africa is very likely to increase substantially over time. Mines, in addition to using fresh and re-using water, may also 'generate' water. This occurs through the filling of mine cavities and the need to pump this water, or the natural decanting of this water where pumping does not take place. This water is referred to as mine decant or mine drainage. This water may be acidic, saline and may contain heavy metals. The mine water typically needs to be treated before it can be reused. The wastewater and effluent treatment technologies for re-use applications are generally proven for South African conditions. Mine drainage can potentially have very negative impacts on the natural aquatic environment and downstream users if left to decant and flow untreated into the fresh water resources. The collection, treatment and reuse of AMD turns the negative impacts into a positive beneficial water use, and releases the billions of litres currently stored in mine voids as a useable recourse for potable and industrial purposes.

Mine water treatment and re-use projects could utilise the large storage available in mining workings, do not have to contend with evaporation loss of water and can deliver reclaimed water in proximity to several large urban areas, such as the Witwatersrand and Mpumalanga Highveld. Several AMD treatment and re-use projects have now been implemented in South Africa demonstrating the technical feasibility, financial viability and stakeholder acceptance of such projects.

The NWRS provides the right signals on the importance of FRESHWATER ECOSYSTEMS, but should elaborate on the processes to develop a more detailed action plan.

Ecosystem integrity in light of great focus on much needed development is a difficult balance that needs much creativity and innovation.

The strategy would benefit from an emphasis on the water-energy-food-land nexus.

The strategy should use the opportunity to talk to the connectness of the fates of each of these important basic conditions for development and that the need for further nexus oriented endeavours would be led by the water sector. Related to this would be the aspects of solutions to empower the development of a Green Economy.

There are two new attractive terms which are introduced in the strategy '***Smart water management***' and '***Smart water governance***'. It would be useful if the NWRS elaborated on these two very promising concepts.

³ Integrated Water Resource Planning for South Africa. A Situation Analysis 2010. Department of Water Affairs. Report No RSA 000/00/12910.

The issue of gender is a key element of the required change in the way we manage water and the NWRS does not give this very important issue sufficient attention.

Much has been written on the feminisation of water management and we have several case-studies in South Africa where the empowerment of women in communities have had a direct positive impact on water management. In a drought prone country such as South Africa, the building of dams to store water is an important part of water security, be it at the national or the very localised level. Access to finance is, throughout the world, easier for the already wealthy than it is for the poor. Access to finance is also often much easier for men than for women. Thus, in conditions of water scarcity, such as in South Africa, the poor experience the real water scarcity, and poor women in particular, are the most vulnerable. It is therefore important that the strategy prescribes to gender sensitive approaches that are to be linked to analysing poverty, vulnerability (as stated above) and resilience.

We have in addition to these strategic comments several specific comments on improvements to the text which we shall forward directly to the Department of Water Affairs. We would also like to highlight that the WRC is committed to contribute its weight of knowledge gained through its projects to enable the further refinement and implementation of the NWRS. We have included in the annexure a sample of the reports that will be of direct relevance in this regard.

Please accept my best regards,



Dhesigen Naidoo
Chief Executive Officer

ANNEXURE

Representative WRC Projects likely to support the NWRS-2 GOVERNANCE

1972	Can we manage our water better?
TT 500/11	ATLAS of Freshwater Ecosystem Priority Areas in South Africa: Maps to support sustainable development of water resources
1845	Comparison of the cost associated with pollution prevention measures to that required to treat polluted water resources
1797	Implementation of Strategic Adaptive Management for freshwater protection under the South African national water policy
1855	Water Allocation Reform in South Africa: History, Processes and Prospects for Future Implementation
1812	Situational analysis of water services provision in South Africa – establishing future strategies for consideration by municipalities
1839	Towards the development of IWRM implementation indicators in South Africa
KV 245/10	Strategic adaptive management as a framework for implementing integrated water resource management in South Africa
1758	An institutional framework for stakeholder participation in transboundary basins
1762	Towards the criteria necessary for the career success of women in the water sector
KV219/09	Assessment of gender equity in water user associations
TT223/04	Women and water: How is gender policy working on the ground?
K8/950	Norms for policy implementation lags in the South African water sector
817	Strategies for empowerment of women in water supply and sanitation projects
TT407/09	The impact of gender in the rural water services environment of South Africa
WATER QUALITY	
850	Inventory of River Health Programme monitoring sites on the Olifants, Sabie and Crocodile rivers
1118	A pilot study to demonstrate implementation of the National Microbial Monitoring Programme
TT 452-10	Water quality overview and literature review of the ecology of the Olifants river
WATERUSE AND WASTE	
1940	Social scarcity of water and water use
1937	Beneficiation of agri-industry effluents
1894	Waste water reclamation for potable reuse
1883	Assessment of the prevalence of organic compound in raw and treated water for potable purpose, their fate in current treatment plants, and compilation of a guideline on best available technology for the removal thereof
1834	Towards passive treatment solutions for the oxidation of sulphide and subsequent sulphur removal from acid mine water
1833	An assessment of the key factors that influence the environmental sustainability of a large inland industrial complex
1832	Technical Guidelines for the determination of municipal effluent charges to encourage industries to switch to Cleaner Production (CP) alternatives.
1830	An assessment of how water quality and quantity will be affected by mining method and mining of the Waterberg coal reserves
1826	Alternative technology for stormwater management
1821	Dual grey and drinking water reticulation systems for high-density urban residential dwellings in South Africa a pilot study
1819	Strategic assessment of personal on-site water use as additional water resource to

	potable Municipal supply in South African urban areas - current trends and future needs
1812	Situational analysis of water services provision in South Africa – establishing future strategies for consideration by municipalities.
1727	Novel technology for the recovery of Water and solid salts from hypersaline Brines: Eutectic Freeze Crystallization
1726	Beneficiation of agri industry effluents
1667	Review of regulatory aspects of the water services sector
1659	Reclamation of water from flooded Witwatersrand gold mines by selective dewatering of key underground compartments.
1628	Prediction of how different management options will affect drainage water quality and quantity in the Mpumalanga coal mines up to 2040
1627	A first order assessment of the quantity and quality of non-point sources of pollution associated with the industrial, mining and power generation sectors
1552	Environmental life cycle impact assessment of water use in selected industrial areas of South Africa
1547	A first order inventory of water use and waste production by the South African industrial, mining and power generation sectors

GROUNDWATER

232/09.	Assessing the impact of research funded by the Water Research Commission on capacity building in the groundwater sector.
1763	A Groundwater Planning Toolkit for the Main Karoo Basin.
273/11	South African Groundwater Governance Case Study.
1917	Groundwater management framework.

Water regulation

1842	Towards Water Resources Regulation in South Africa; volume 1.
	Volume II: Institutional Criteria, Functions and Arrangements
	Volume III: The use of Regulatory Impact Assessment in the developing approaches and tools for the pro-poor water resources regulation
<u>TT/476</u>	An investigation into the water infrastructure development financial allocation pathways in municipalities
1839	Towards the development of IWRM implementation indicators in South Africa
1840	Integrating water resources and water services management tools
1888	A Risk-Based Methodology to Assess Social Vulnerability in the Context of Water Infrastructure

Water pricing and tariff

1570	Econometric model to predict the effect that various water resource management scenarios would have on South Africa's economic development
1871	Investigating the Mechanism and Processes Used in Setting Water Services Tariffs
886	Cost and tariff model for rural water supply schemes
992	Guidelines for setting water tariffs with a focus on industrial, commercial and other non-residential consumers