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ABBREVIATIONS/ACRONYMS

AGSA	Auditor-General of South Africa	DPE	Department of Public Enterprises
AGWNet	African Groundwater Network	DST	Department of Science and Technology
AMCOW	African Ministers' Council on Water	DWS	Department of Water and Sanitation
AMD	Acid mine drainage	EDC	Endocrine disrupting compound
ARC	Agricultural Research Council	EM	Executive Manager
BNR	Biological nutrient reactor	FAO	Food and Agriculture Organisation
BBBEE	Broad Based Black Economic Empowerment	FETWater	Framework Programme for Education and Training in Water
BMGF	Bill and Melinda Gates Foundation	Gates	Bill and Melinda Gates Foundation
CapNet	Capacity Development in Sustainable Water Management	GWP	Global Water Partnership
CEO	Chief Executive Officer	HCD	Human capital development
CFO	Chief Financial Officer	HDI	Historically disadvantaged institution
CMA	Catchment Management Agency	IIASA	International Institute for Applied Systems Analysis
CSIR	Council for Scientific and Industrial Research	IORA	Indian Ocean Rim Association
DST	Department of Science and Technology	IWA	International Water Association
DAFF	Department of Agriculture, Forestry and Fisheries	IWMI	International Water Management Institute
DEA	Department of Environmental Affairs	IWRM	Integrated water resource management
DHS	Department of Human Settlements	KSA	Key Strategic Area
DMS	Department of Mineral Resources	MBI	Municipal Benchmarking Initiative
DoA	Delegation of Authority	MEC	Member of Executive Council
DOF	Department of Finance	MOA	Memorandum of Agreement
		MOU	Memorandum of Understanding

MTEF	Medium Term Expenditure Framework	SCM	Supply Chain Management
NDP	National Development Plan	SRFA	Sanitation Research Fund for Africa
NFEPA	National Freshwater Ecosystem Priority Areas	S&T	Science and Technology
NGP	New Growth Path	TIA	Technology Innovation Agency
NIRESA	Network on Irrigation Research and Extension for Smallholder Agriculture	TR	Treasury Regulations
NPC	National Planning Commission	UNDP	United Nations Development Programme
NWA	National Water Act	UNESCO	United Nations Educational, Scientific and Cultural Organisation
NWRS 2	National Water Resource Strategy Two	UP	University of Pretoria
OECD	Organisation for Economic Cooperation and Development	VIP	Ventilated Improved Pit (latrine)
PDI	Previously Disadvantaged Individual	WaterKCAP	Water Knowledge and Capacity Building Programme
PDP	Personal Development Plan	WHO	World Health Organisation
PFMA	Public Finance Management Act	WISA	Water Institute of Southern Africa
PPC	Parliamentary Portfolio Committee	WRA	Water Research Act
R&D	Research and Development	WRC	Water Research Commission
RDI	Research, Development and Innovation	WRL	Water Research Levy
SADC	Southern African Development Community	WSA	Water Services Act
SALGA	South African Local Government Association	WSI	Water Services Institution
SASTEP	South African Sanitation Technology Demonstration Programme	WS&T	Water, science and technology
SMME	Small Medium and Micro Enterprises	WSLG	Water Sector Leadership Group
		YWP	Young Water Professionals

CHAIRPERSON'S ADDRESS

It is my pleasure to report on the activities and performance of the Water Research Commission (WRC) for 2014/15. The presence of such a unique organisation has never been more pertinent as South Africa grapples with the growing need to secure sustainable water supply for socio-economic development in a water-scarce environment.

As democratic South Africa reaches young adulthood we must not lose sight of the importance of achieving universal access to water and sanitation for all, including the need to ensure that our people have access to water for productive purposes. Access to water remains as critical to health, well-being and sustainable livelihoods as it did 21 years ago when the country stepped onto the threshold of democracy.

The WRC, through its strong partnerships with national and international individuals and organisations, is committed to providing the scientific knowledge and innovation that can support the implementation and drive the development and review of policy, contribute to improving the lives of South Africans, particularly the poor and the marginalised, and enhance environmental sustainability and climate resilience. The WRC thus has a strong focus on supporting relevant research that addresses national priorities.

In its role as neutral knowledge broker the WRC hosted two significant events in the water sector this year. First was the National Water Summit, held on 1 and 2 August 2014 in Boksburg and led by the Minister of Water and Sanitation, Minister Nomvula Mokonyane. The event attracted more than 400 delegates from all nine provinces. Considered by many to be the start of a new conversation around South Africa's water, the Summit offered a rare opportunity for deep multi-stakeholder engagement to critically examine our water and sanitation challenges as well as our responses to these over the past two decades.

Invited participants engaged on topics related to meeting the service delivery challenge; the water and sanitation policy environment; water research,



development and innovation choices; the state of South Africa's water resources and the role of the private sector. The National Water Summit declaration has at its core the development of a water and sanitation 10-year plan. This is a crucial instrument in taking the conversation forward towards collective implementation.

The WRC also hosted the Gender, Water and Development Conference, which took place at the East London International Convention Centre, from 2 to 7 November 2014. The theme of the conference was 'The untapped connection'. The conference brought 430 participants together from 36 countries to discuss how best to address issues related to gender and water, including formulating and implementing gender in water policy; mobilising strategic human and financial resources; implementing project interventions through economic empowerment; and undertaking, sharing and implementing strategic research and operational knowledge, among others. It was the first conference of its kind to be held in Africa. A major highlight of this conference was the Ministerial Declaration on water and gender aimed at mainstreaming gender in national policies.

A further highlight of the conference was the 'indaba' session, in which participants from across the world and from all walks of life engaged in a bottom-up process of identifying and unpacking critical issues

relating to the achievement of gender mainstreaming in the water sector. This session enabled participants not only to listen to the experiences of others, but to truly participate in shaping the discussion and outcomes.

During 2014/15, the WRC also took a leading role in the development of South Africa's Water Research, Development and Innovation (RDI) Roadmap. This Roadmap is a high-level planning tool to drive the refocusing of research, reprioritisation of funds, synergising of existing initiatives and ring-fencing of new resources in order to facilitate a more effective water innovation system. The Roadmap provides a structured framework to focus the contribution of RDI activity on the implementation of national policy, strategy and planning for water management in South Africa.

The WRC has also been driving an approach in which South African communities and water users are not passive recipients of scientific outcomes, but participate in and guide research and development activities. This is in line with growing calls worldwide for science and research to deliver an actual impact in society.

Having a strong water R&D community is a prerequisite to the WRC achieving its objectives. Capacity building and transformation therefore remain a strong part of the Commission's research portfolio. During 2014/15, no less than 496 post-graduate students were supported through WRC research projects, more than 83% of them being from previously disadvantaged groups. This large number of Masters and PhD candidates provides critical mass required for the next generation of practitioners, academics and researchers in the water sector.

In recent years the WRC has also adjusted its portfolio to train and mentor new research leaders. More than 60% of research leaders on new projects are now from designated groups and the majority are less than 50 years old. This is both assisting with the national transformation project and building the next generation of researchers and thought leaders.

During the year under review the WRC also undertook no less than 20 community-based research projects varying in topic from inland fishing and smallholder agriculture to indigenous water management and sustaining ecological services in rural areas. The general consensus from the community of practice is that the value-add of this injection of diversity is already having a positive impact on the overall portfolio.

Finally, 2015 sees the end of the tenure of the current Board, and I would like to take this opportunity to thank the Board members for their hard work and dedication to ensuring the WRC remains real and relevant to an evolving South African society. I would also like to thank the WRC management team for their excellent support to the Board in carrying out its work, and for the role that they play not only in driving a world-class research programme in South Africa, but also for the leading role they play in the water sector in South Africa and internationally.



Barbara Schreiner
Chairperson of the Board



The Global Conference on Gender and Water attracted 430 participants from 36 countries to discuss how best to address several issues related to gender and water.

CEO'S ADDRESS

COMING OF AGE: MOVING KNOWLEDGE TO ACTION

The 2014/15 financial year saw us celebrating the twentieth year of our country's democracy. Our country is a young adult, and none too soon as the challenges that we face are going to require the creativity and adventure of an adolescent as well as the maturity of an adult to be managed successfully. The reality of our water scarcity and our insufficient energy security has become stark. The negative knock-on effects on food and nutritional security as well as health security are increasingly sharpened.

In addition, we are facing this in a time of budgetary tightening and further economic contraction. The temptation in such times is strong to gather all your available resources and invest in Band-Aid solutions to address the immediate problems and shore up the ability of the state to ensure the social security net. While this might provide short-term relief in many quarters, this does not amount to an investment in our future prosperity and well-being.

We need a combination of short-term interventions to address the immediate challenges and relieve the incredible stress on the water system, while concomitantly developing smart, creative, innovative and sustainable medium- to long-term solutions for both national water security as well as inter-national competitiveness. While some may consider this incomprehensible in the wake of lead articles on a weekly basis highlighting the precarious nature of South Africa's current water fortunes, others will recall that many of the countries such that we today consider highly successful such as South Korea and even Finland had the beginnings of that growth trajectory in times of extreme hardship.

The achievement of a higher level to water security and the expansion of the frontiers of dignity through accessible safe sanitation will require us as the water science and technology community to up the game.



We need to accelerate our efforts to bring Knowledge to Action. This requires us to more actively package scientifically derived knowledge in a form that brings a much larger group of people into the conversation in a manner that strongly empowers participation and influences decision-making. The WRC research portfolio reflects this shift in the 2014/15 financial year, with a total of twenty community-based research projects funded to facilitate positive relationships with communities through active community participation. Similarly, 32 SMMEs were funded as project leaders to promote small business development and job creation.

We have also expanded our efforts to bring laboratory proven solutions to demonstration as the bridge to on-the-ground implementation at scale. In the WRC portfolio alone we have more than 50 of such candidates. In 2014/15 some highlights in this regard include the Arumloo, a micro-flush toilet capable of flushing on less than a litre of water, the optimisation of fog water collection, the launch of one of South Africa's first ever conduit hydropower plants in Bloemfontein, developing smart water design for urban centres, and launching South Africa's first publicly-accessible water resources website to mention only a few.

The third vital component of the Knowledge to Action narrative is the deepening and expansion of existing

partnerships and the development of new ones. Partnerships across sectors (public and private), across domains and disciplines and covering the entire innovation value chain. The WRC family is happy to have formed partnerships with the Southern African Regional Irrigation Association (SARIA) to strengthen research, communication, training and development of appropriate science and technologies in irrigation and drainage for gender-balanced poverty eradication and economic development. Another noteworthy partnership has been with the Organisation for Economic Cooperation and Development (OECD) within the latter's Water Governance Initiative. Further afield, the WRC has successfully developed the first Water Science and Technology Working Group for the Indian Ocean Rim Association (IORA) to formulate and implement projects for economic cooperation relating to trade facilitation, promotion and liberalisation, and promotion of foreign investment and tourism, scientific and technology exchanges, as well as the

development of infrastructure and human resources in relation to water.

We would like to emphasise our gratitude to Minister Nomvula Mokonyane for her acute leadership, the WRC Board for their guidance and generous support, and the broader stakeholder base for an incredible partnership during the year. A special word of appreciation to the WRC management and team for an enthusiastic embracing of an ambitious strategy and translating the implementation plan into a narrative that has lived true to our motto of *Olwazi Amandla Awethu* meaning the Power of Knowledge to the People.



Dhesigen Naidoo
WRC CEO

SECTION A

STRATEGIC OVERVIEW

The first administration of the third decade of South Africa's democracy has made the notion of a 'radical socio-economic transformation' the centre-piece of its five-year strategy. In the water and sanitation sector this translates to achieving universal access to sustainable water and sanitation services in South Africa while maintaining or, where possible, enhancing the integrity of our water resources. The presence of a unique organisation such as the WRC is ever more pertinent as South Africa becomes increasingly aware of the scarcity of its water resources and the important role water has to play in the growth and development of its people. This section provides a strategic overview of the WRC for the 2014/15 period, the third year in its current five-year strategic planning cycle.

ABOUT THE WRC

The WRC was established through the Water Research Act (WRA), Act No. 34 of 1971. The WRC operates and accounts for its activities in accordance with the Public Finance Management Act (PFMA), Act No. 1 of 1999 as amended, and is listed as a Schedule 3A public entity.

The primary function of the WRC is to promote coordination, cooperation and communication in the area of water research and development; establish water research needs and priorities; stimulate and fund water research according to priority; promote the effective transfer of information and technology; and enhance knowledge and capacity building within the water sector.

THE POWER OF KNOWLEDGE TO THE PEOPLE



Vision

To have highly informed water decision-making through science and technology at all levels, in all stakeholder groups, and innovative water solutions through research and development for South Africa, Africa and the world.



Mission

To be a global water knowledge node and South Africa's premier water knowledge hub active across the innovation value chain that:

- informs policy and decision making;
- creates new products, innovation and services for socio-economic development;
- develops human capital in the water science sector;
- empowers communities and reduces poverty;
- supports the national transformation and redress project; and
- develops sustainable solutions and deepens water research and development in South Africa, Africa and the developing world.



Values

- A culture of learning and sharing
- Innovation and creativity
- Integrity and fairness
- A spirit of professionalism and service orientation
- Facilitating empowerment and social change
- Good governance

STRATEGIC OUTCOME-ORIENTED GOALS

In addition to contributing to several Government Outcomes, the WRC's strategic outcome-orientated goals consists of five impact areas based on the operationalisation of the WRC Knowledge Tree, the guiding framework used by the WRC to define, measure and evaluate research impact.

The WRC strives to achieve Knowledge Tree impact areas through the research that it funds. This applies within a research project, to post-project actions, and to follow-on projects. By 2014/15 the Knowledge Tree had been well entrenched in the WRC's activities, with all research proposals articulating objectives of the Knowledge Tree branches.

The WRC continues to focus on the development of its impact narrative that provides a pathway from research



Figure 1 The WRC Knowledge Tree

to impact. This entails a continuous review of current actions and activities as well as the identification of new actions that will ensure impact realisation.

LEGISLATIVE AND OTHER MANDATES

The world of the WRC is governed by numerous legislative and other mandates, some of which are in a state of review and revision. The WRC is governed by the Water Research Act (WRA), which outlines the

purpose and mandated objectives of the organisation. The mandated objectives of the WRC are also in accordance with the requirements of the legislation that governs the actions of the Department of Water and Sanitation (DWS), principally, the National Water Act (Act No. 36 of 1998) and the Water Services Act (Act No. 108 of 1997).

Water Research Act (Act No. 34 of 1971 as amended)

The principal aim of the WRA is to provide for the promotion of water and related research. The Act

Table 1 The WRC's strategic outcome-orientated goals

Strategic Outcome-Oriented Goal 1	<p>Inform policy and decision-making</p> <p>The WRC aims to commission appropriate evidence-based knowledge generated to guide decision-making, influencing the development of policy, practice or service provision, shaping legislation, altering behaviour, contributing to the understanding of policy issues, and reframing debates.</p>
Strategic Outcome-Oriented Goal 2	<p>Develop new products and services for economic development</p> <p>The WRC capitalises on those projects that have potential to develop new intellectual property or to introduce innovations which create new or improved technologies, products and services that can be used in the real economy. Effectively, this is the WRC's contribution to job creation, and economic development through water science innovations.</p>
Strategic Outcome-Oriented Goal 3	<p>Enhance human capital development (HCD) in the water and science sectors</p> <p>The WRC strives to have high levels of student participation in its projects. Although the emphasis is on post-graduate degrees, inclusion of undergraduates has also been investigated. There is also a particular emphasis on previously-disadvantaged individuals (PDIs) and women. The WRC also aims to support institutional development through mentorship provided to new research leaders.</p>
Strategic Outcome-Oriented Goal 4	<p>Empower communities</p> <p>The WRC places an emphasis on projects that (a) include communities not only as end-users of research but as active participants in the research process from the project design phase; (b) have a direct impact on the livelihoods of communities through water-related interventions, and (c) build sufficient capacity to assist with the post-project sustainability of those interventions.</p>
Strategic Outcome-Oriented Goal 5	<p>Promote transformation and redress</p> <p>This goal focuses on growing PDI involvement/leadership in projects, as well as helping to promote socio-economic development through the reduction of poverty and inequality in South Africa, particularly of marginalised groups such as women and youth.</p>
Strategic Outcome-oriented Goal 6	<p>Drive sustainable development solutions</p> <p>The WRC prioritises those projects that provide sustainable development solutions that have had positive effects on the environment, economy and society including: protection of water resources, optimal water use, equity between generations, equitable access, environmental integration and good governance. Additionally, this goal focuses on developing knowledge products that are fit-for-use to ensure the uptake of research.</p>

requires the establishment of the WRC and the Water Research Fund, and sets the framework within which the WRC operates.

The WRC's mandate as set out in this Act highlights the following functions to be carried out by the organisation:

- Promote co-ordination, co-operation and communication in the area of water research and development
- Establish water research needs and priorities
- Stimulate and fund water research according to priority
- Promote the effective transfer of information and technology
- Enhance knowledge and capacity building within the water sector

National Water Act (Act No. 36 of 1998)

The objective of the National Water Act (NWA) is to ensure that South Africa's water resources are protected, used, developed, conserved, managed, and controlled in a sustainable and equitable manner, for the benefit of all persons. The NWA also provides for the pricing strategy for water use charges, the primary mechanism for the calculation of a charge, payable by some or all raw water users, that is also set for research purposes by the WRC. The role of the WRC is to align its funding priorities with those key national water challenges articulated in the NWA, and to help solve water-related problems which are critical to South Africa's sustainable development and economic growth.

Water Services Act (Act No. 108 of 1997)

The objective of the Water Services Act (WSA) is to provide for the right of access to basic water supply and basic sanitation by setting national standards and norms. Section 156, read in conjunction with Part B of Schedule 4 of the Constitution of the Republic of South Africa (Act No. 108 of 1996), vests in the Executive Authority the responsibility to support and strengthen the capacity of municipalities to manage their own affairs, to exercise their powers and to perform their functions. Again, the applicability of the WSA to the WRC rests in the WRC's duty to respond to water

supply and sanitation needs with research and development that helps to address those needs.

PLANNED LEGISLATIVE MANDATES

All three Acts are being revised and have a strong possibility of being amended in a manner that strengthens the WRC mandate.

Review of water-related legislation

The DWS is reviewing the NWA, the WSA, and the WRA. While the WSA provides a legal framework for the progressive realisation of the right to access to sufficient water, the Act is under review to ensure that there is equity in the allocation of water, to improve water resources management and to streamline the regulatory processes. In turn, the WSA is being reviewed to improve provision of water services to ensure alignment with the provisions of the Municipal Systems Act (Act No. 32 of 2000) and the Municipal Finance Management Act (Act No. 56 of 2003). The revised policy positions necessitate the consolidation of the NWA and WSA into one piece of legislation that will govern the entire water value chain covering water supply and sanitation services as well as water resource infrastructure. This consolidation will not only allow for managing water across the value chain but will also enhance cooperative governance and set clear institutional roles and responsibilities with commonly agreed targets for water delivery.

Water Research Amendment Bill

Addressing current and future water knowledge gaps and the way in which these are currently prioritised in the South African context demands the evolution of the regulation and governance structures of any research institutions. The purpose of the Water Research Amendment Bill, 2013, is to:

- Amend the WRA so as to insert certain definitions and substitute others;
- Effect certain textual improvements and name changes;
- Provide for the appointment of members of the Board and the CEO in line with other public

entities in the water sector and current practice of Corporate Governance;

- Regulate the governance of the Water Research Council (Water Research Commission in the current Act)
- Align the Act with applicable legislation, such as the NWA, WSA and the Public Finance Management Act, 1999; and to
- Provide for matters incidental hereto.

While the new clauses in the Amendment Bill do not legislate for a change in the relationship between the DWS as the shareholder department and the WRC as a public entity; the process of developing the draft bill has created the discussion space enabling these two public sector partners to draw closer together and iron out the modalities of governance, cooperation and the complementarity of roles.

POLICY MANDATE

The WRC's corporate plan is also informed by other key strategies, most notably the National Water Resource Strategy 2 (NWRS 2).

NWRS 2

The NWRS 2 calls for a much larger contribution from R&D to empower the implementation of the strategy. In addition, the Strategy also engages the further development of water sciences in South Africa. One of the key deliverables that the NWRS 2 emphasises is the Sector Research and Innovation (R&I) Strategy. In support of this, it is incumbent upon the WRC to coordinate the development of the National Water R&D Plan, with the latter also emphasised in the Water Research Amendment Bill.

Some of the additional contributions that the NWRS 2 requires from the WRC include:

- Desalination of seawater
- Job creation
- Mining, energy and manufacturing industries
- Awareness and communication
- Research and development
- Scenarios, climate change modelling and water availability
- Hydraulic fracturing and coal-bed methane extraction

These areas call on the WRC to collaborate with the DWS and other Government departments such as the Department of Trade and Industry, Department of Economic Development, Department of Environmental Affairs, Department of Human Settlements, and the Department of Mineral Resources, as well as other sector partners such as Eskom, Rand Water and Sasol, to develop appropriate technologies and support the development of relevant centres of excellence in several of the fields of research described above. In this regard, the WRC, together with the DST have completed a consultative process and developed the Ten-year Water Research, Development, and Innovation / Deployment Roadmap that provides a sector-defined, needs-driven research agenda that caters for the public sector (utilities, municipalities), private industry, agriculture, and environmental protection. The roadmap outlines seven 10-year plans that provide itemised, actionable tasks under the following topic headings:

- Water supply
 1. Increase ability to make use of more sources of water, including alternatives
 2. Improve governance, planning and management of supply and delivery
 3. Improve adequacy and performance of supply infrastructure
 4. Run water as a financially sustainable "business" by improving operational performance
- Water demand
 5. Improve governance, planning, and management of demand and use
 6. Reduce losses and increase efficiency of productive use
 7. Improve performance of pricing, monitoring, billing, metering and collection

The roadmap has been endorsed by DWS as the implementation plan for the R&D chapter of NWRS 2.

ORGANISATIONAL ENVIRONMENT

The primary functions of the WRC are to fund and steer the water research agenda in South Africa, and to effectively disseminate and communicate research findings. Administrative activities are carried out to ensure compliance with regulatory requirements and to provide an enabling environment for research management.

Figure 2 WRC organisational environment



Figure 3 WRC organisational structure

