



water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

2015 WRC RDI SYMPOSIUM

Water Re-Use – Concepts, Application and Strategy for South Africa

Presented by:

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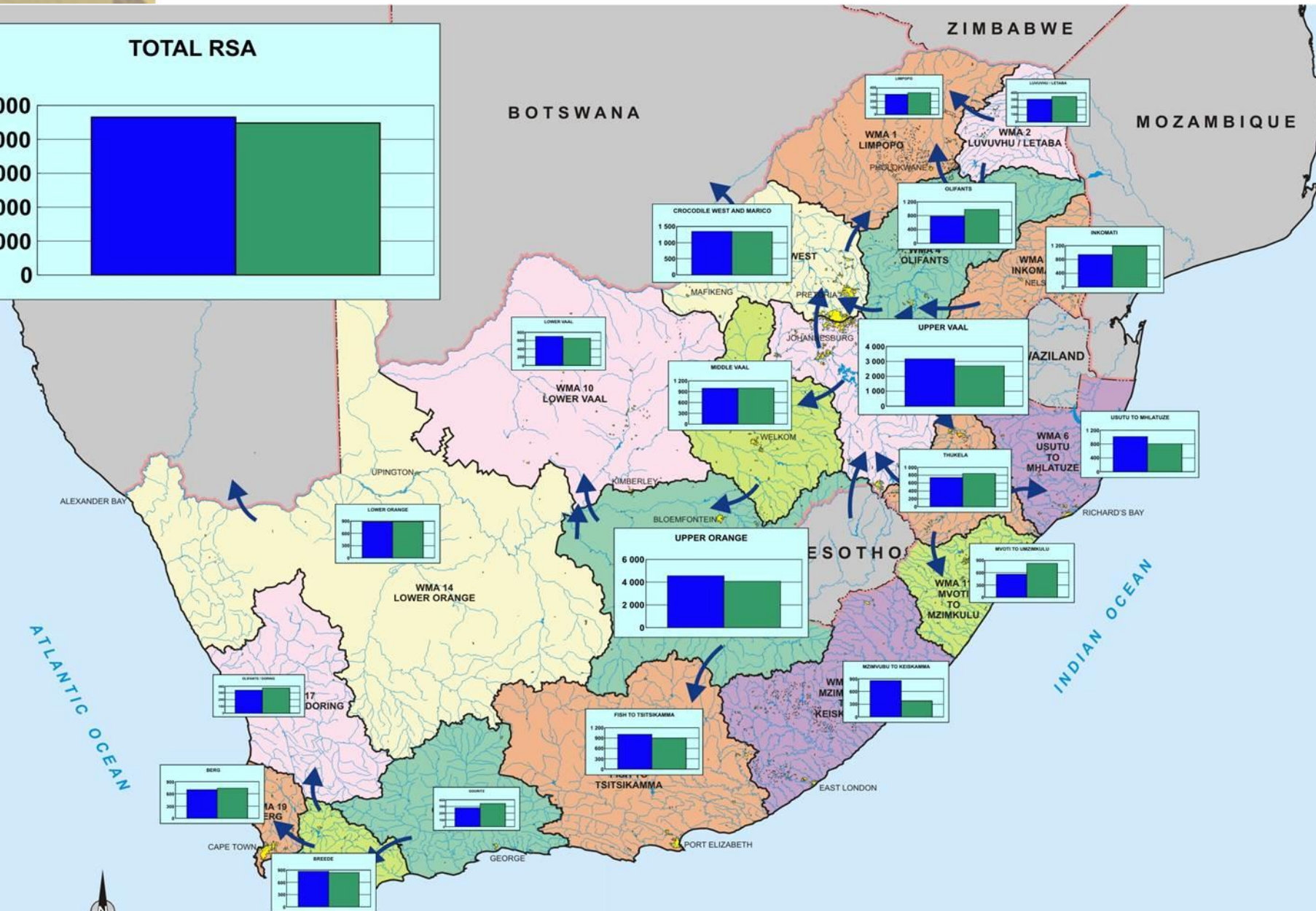
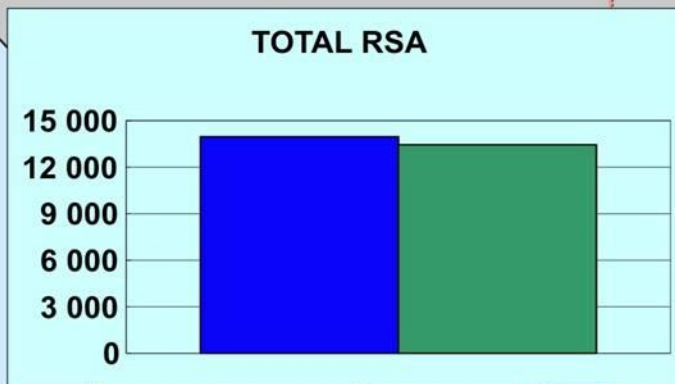
**Chief Engineer: National Water Resource Planning
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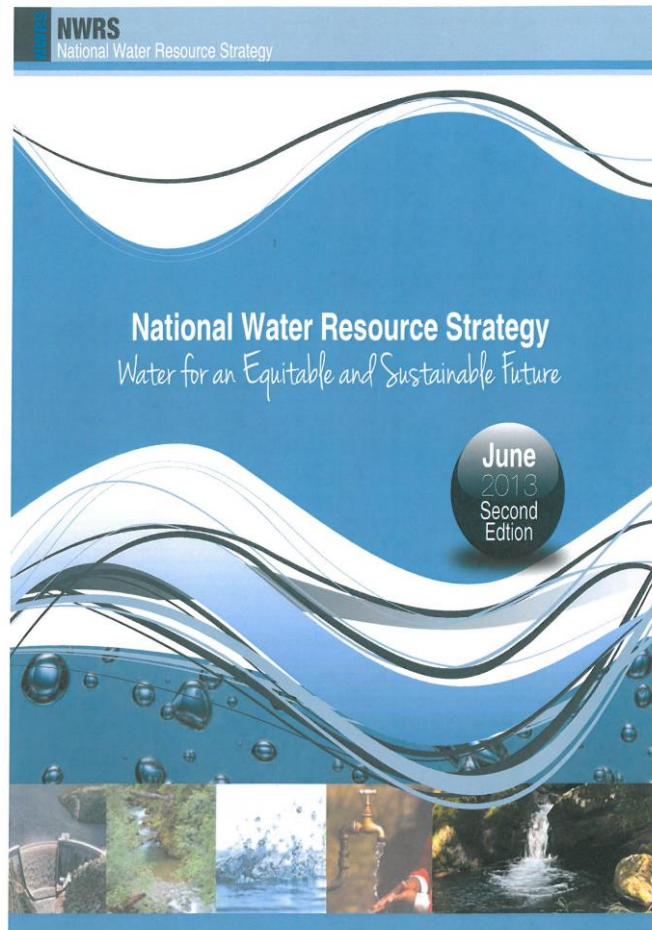
Date: 18 September 2015

Structure of presentation

- Water resources in South Africa
- Water re-use in context of water resources
- Defining water re-use
- Re-use in the context of water supply, covering a number of key water use sectors
- Key strategic actions to implement water reuse

Water resources reconciliation





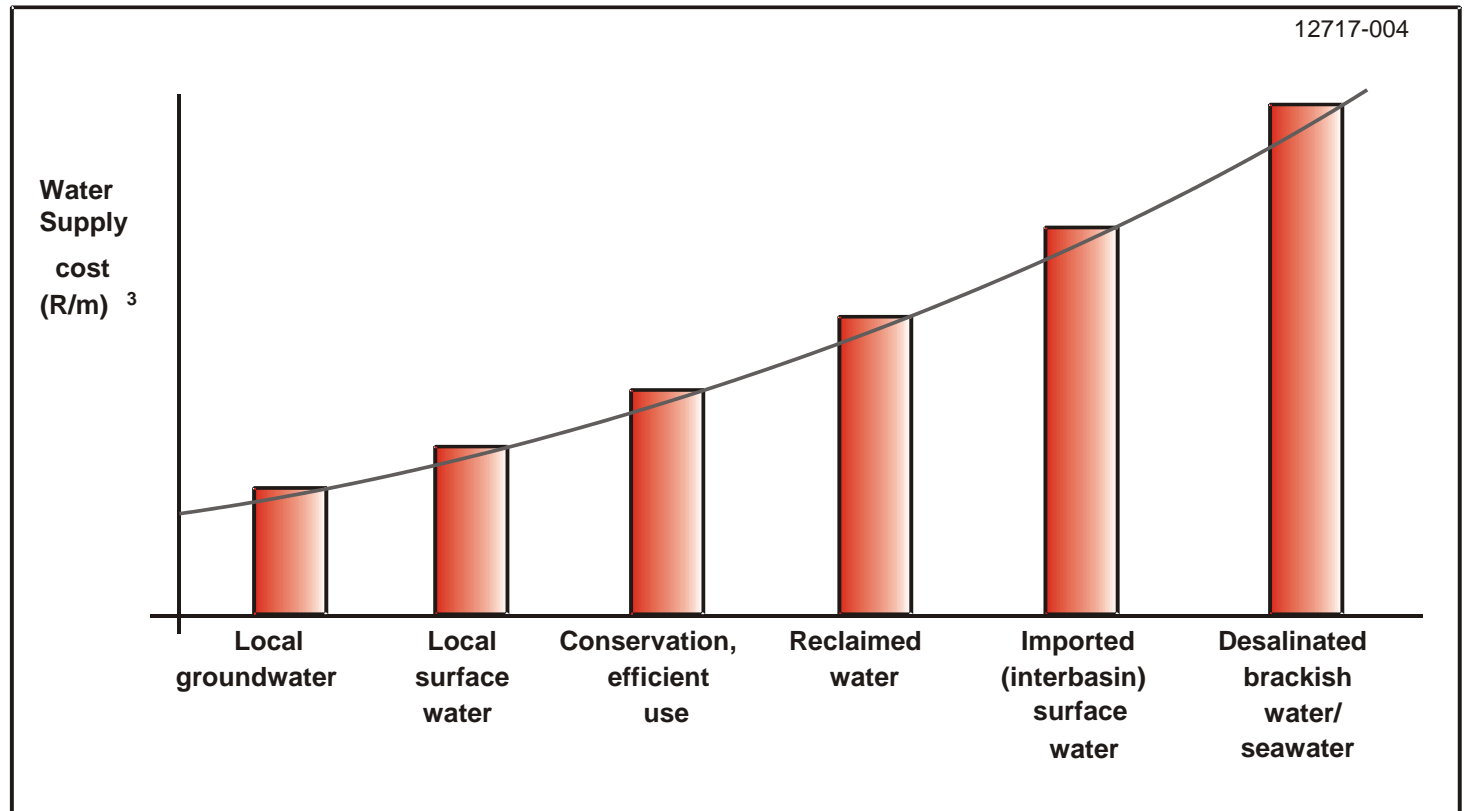
<https://www.dwa.gov.za/nwrs/NWRS2013.aspx>

Sources of Water

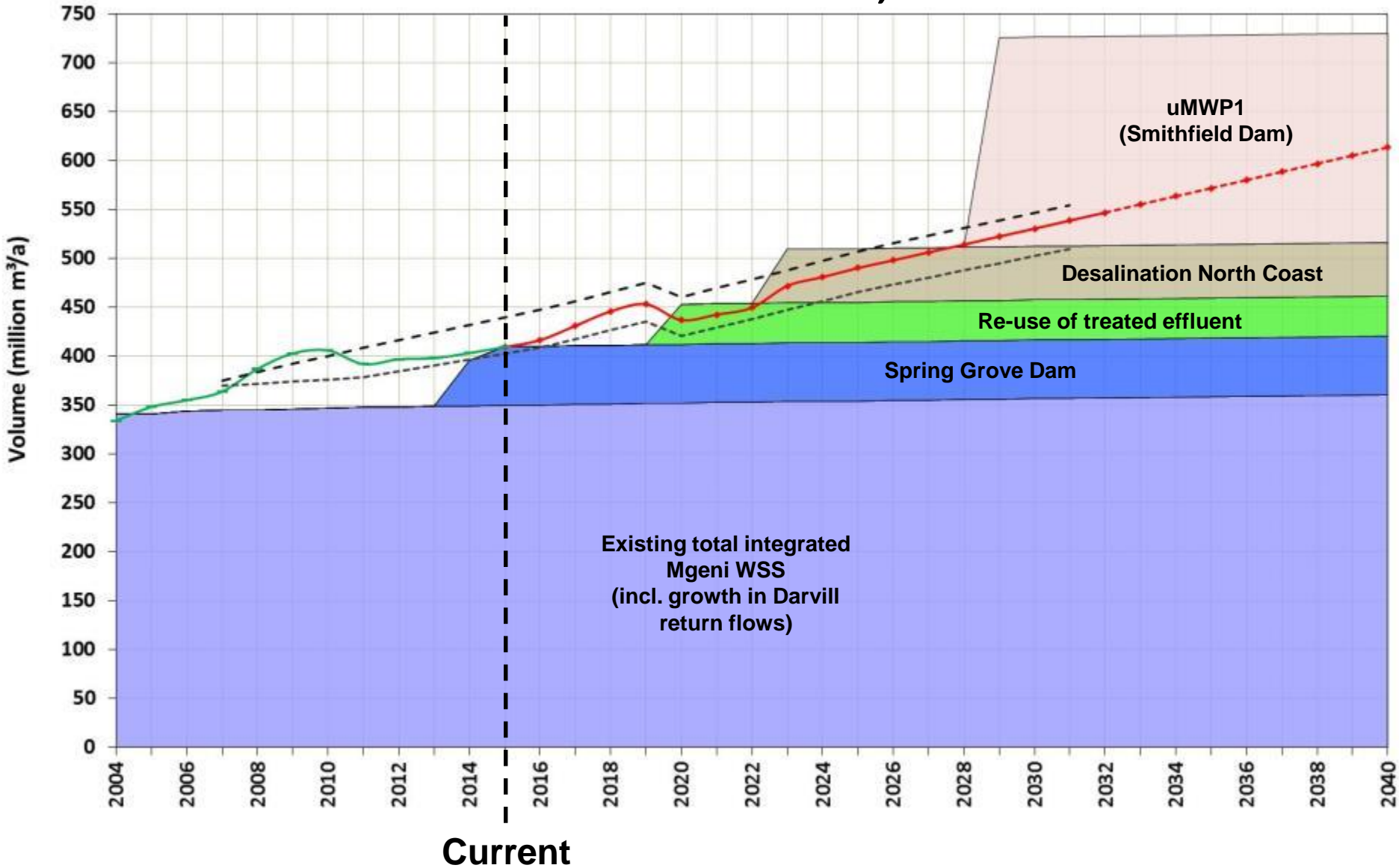
Water resources planning recognises a number of sources of water including:

- Water conservation and water demand management
- Surface water (runoff, surface dams)
- Groundwater
- Return flows/discharges
- **Reclamation/re-use/AMD**
- Rainwater harvesting
- Catchment rehabilitation and management
- Water re-allocation

Generic Cost of Interventions



Balance: Re-use and Desal, then uMWP1



Defining Water Re-use

Water Re-use:

- *Can be:*
 - Direct or Indirect
 - Intentional or Unintentional
 - Planned or Unplanned
 - Local or Regional

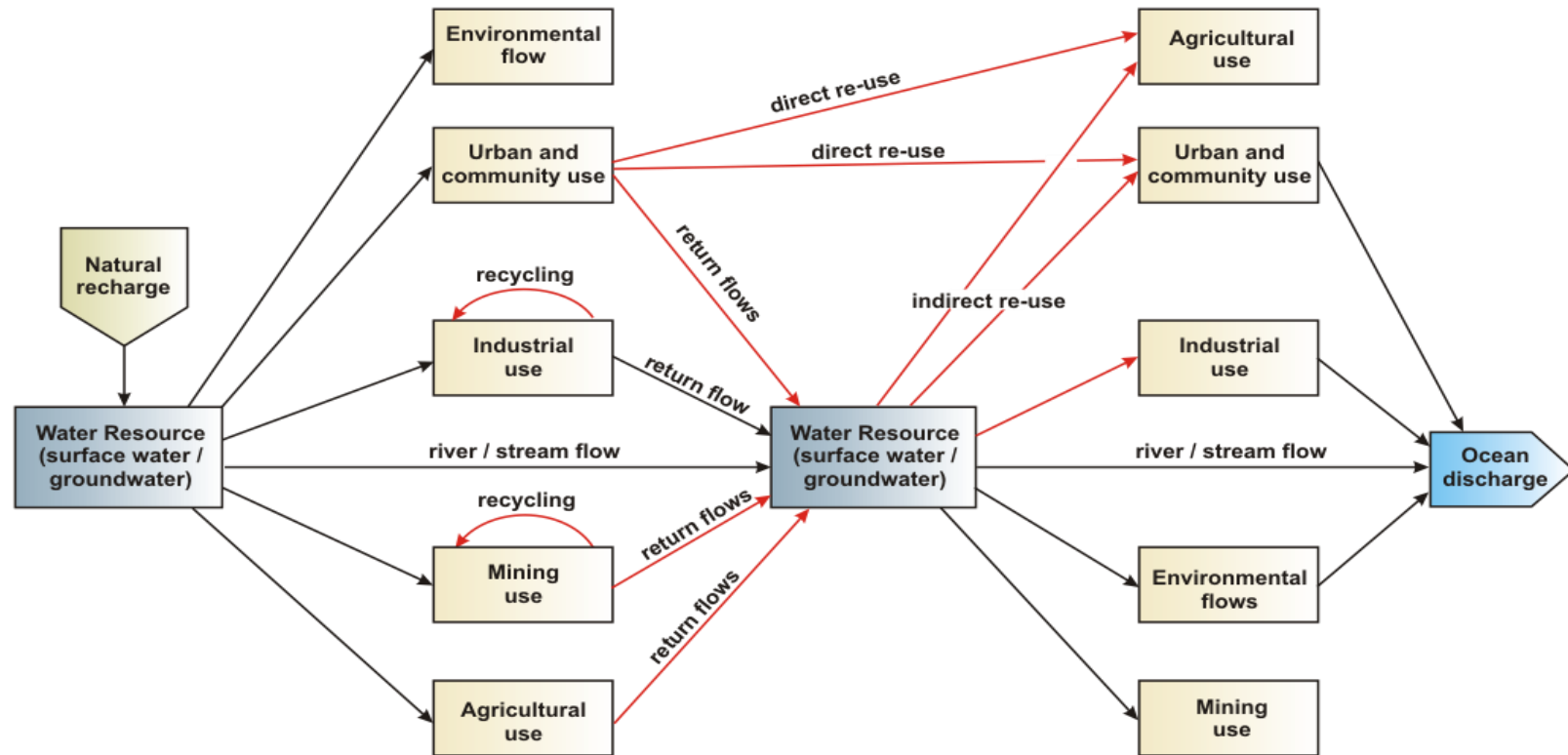
- *May involve:*
 - Various kinds of treatment to render water fit for re-use

- *May be used:*
 - For variety of water-related purposes

The concept of Water Re-use therefore has many interpretations and nuances.

Ways water can be re-used and recycled

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Note: This figure does not show all possible water use, re-use and recycle, but demonstrates the concepts.



Re-use in the Context of Water Supply

Water sectors with potential for re-use

- Agriculture
- Municipal –potable and non potable
- Industry
- Mining
- Power generation

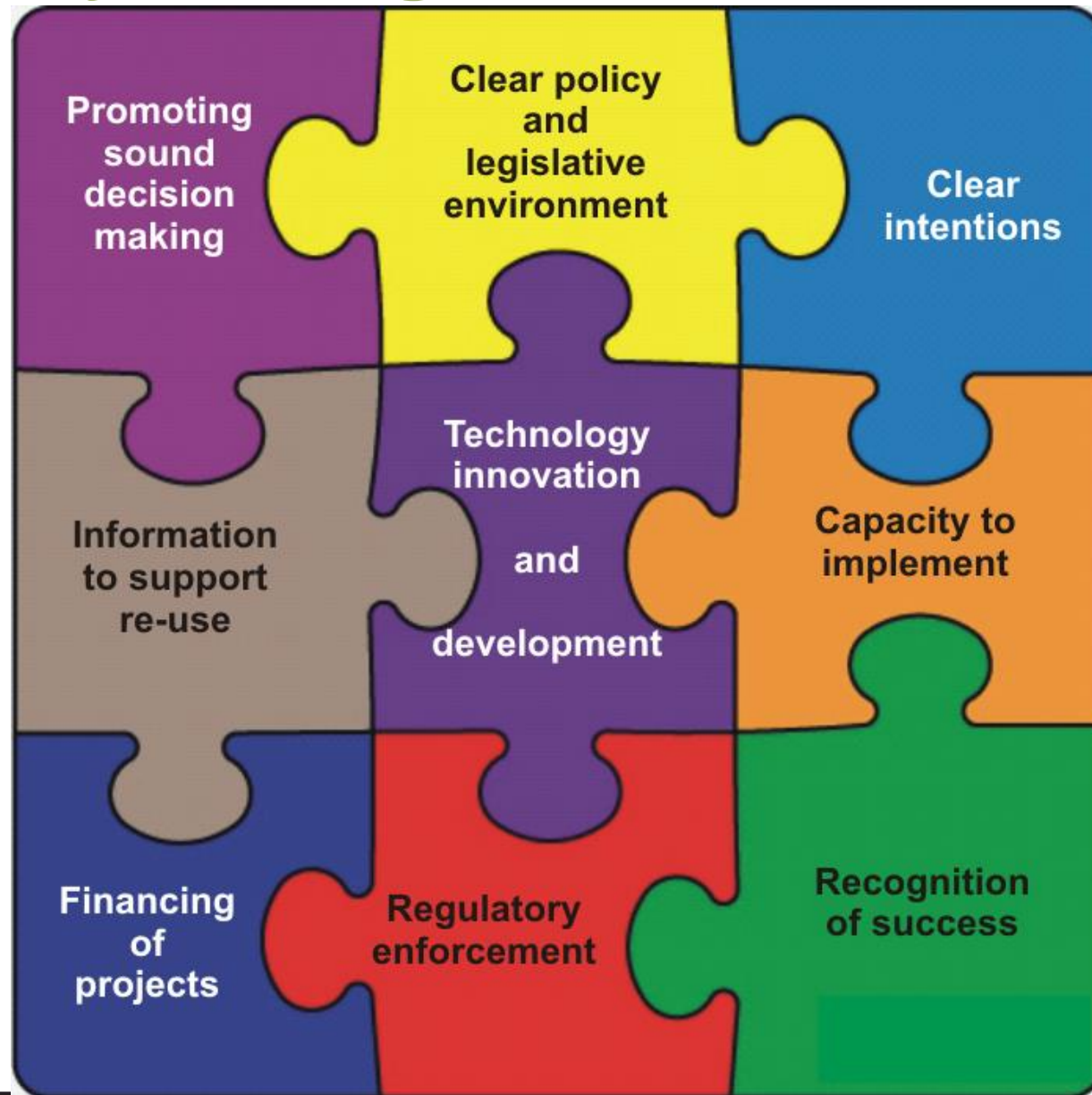
Water resource considerations

- Water re-use has good potential to solve local water shortage problems
- Inland direct water re-use results in and upstream shift of yield
- Water re-use gives best benefit in coastal applications (uses water that would have discharged into the sea)



Key strategic actions to support a national water re-use strategy

Key strategic actions



Promoting Sound Decision Making

- Decision making will vary across scales, levels and applications. Strategy is intended to encourage wise decisions relating to water re-use.
- Three important factors:
 - A sound and **clear policy** and legislative framework (rights and obligations are known and what can and cannot be done).
 - The **benefits, risks and costs are clearly understood**
 - Decision makers and planners have access to relevant **information and support** to make informed decisions.

Creating a Clear Policy and Legislative Environment

- Water re-use subject to various **regulatory control** (different legislation)
- **Multiple laws / regulations** make water re-use projects difficult to implement.
- DWS will facilitate:
 - Developing clear and practical guidelines for water re-use projects
 - Working with other Government Departments to align legislation, reduce the regulatory burden
 - Act as the lead regulatory authority to assist in working with other Departments in getting approval for water re-use projects, and
 - Working with Municipalities to ensure that Municipal By-laws support the appropriate re-use of water;
 - Ensuring the water quality standards implemented are appropriate in a context where water re-use is a strategic imperative (see 'reviewing water quality standards' below);
 - Use the water licensing process as a key tool to promote water use efficiency and,
 - Implement the waste discharge charge system.

Clear Incentives

- Re-use projects need to be **cost –effective** compared to other water supply alternatives.
- DWS should take the importance of price signals and incentives in water re-use decisions into account when reviewing the **Water Pricing Strategy**.

Information to Support Sound Decision Making and Implementation

- DWS recognizes the important role of good **information** support system.
- Three related aspects:
 - **Methodologies** for evaluating water resource development options to **include re-use**;
 - **Guidelines** for implementing water re-use projects;
 - **Public education and awareness**

Research Innovation and Development

- South Africa has the potential to be a leading innovator in water re-use technology (particularly in acid mine drainage).
- DWS will **encourage participation** in water re-use:
 - Research and development – **WRC and Universities**
 - **Tertiary education**, vocational training institutions
 - **Professional institutions**, trade organizations

Capacity To Implement

- Limited number of water re-use projects, small local base of knowledge and expertise.
- Competent implementing agency will be nurtured.
 - **Water re-use projects are complex and sophisticated, require high level of competence and skill. Capable implementation agency will require:**
 - Technical expertise
 - Planning ability
 - Project management capability
 - Financial strength
 - Trusted water services delivery
 - Accepted by community and customers

Capacity to Implement

- **Developing skills for operating and maintaining water re-use projects:**
 - Assessment of the current and future skilled and trained people needed to operate water reclamation, water recycling and water re-use projects;
 - Encourage water services authorities and water services providers to consider and plan for the staffing and training needs to support water re-use projects; and
 - Alert training and educational institutions in the water sector of growing needs for trained and skilled operations and maintenance staff.

Enforcement

- **Compliance** of existing WWTWs to achieve strict discharge standards is critical to the future success of water re-use.

This will require:

- **Strict enforcement of discharge standards;**
- Addressing the management and performance failures of municipal wastewater treatment plans.

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