

Continuation of the Integrated Vaal River System Reconciliation Strategy Study (PHASE 2)

Information document

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water & sanitation

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Water and Sanitation
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Purpose of this document

The purpose of this document is to announce the study for the continuation of the Integrated Vaal River System Reconciliation Strategy – Phase 2 of the Department of Water and Sanitation (DWS).

The document provides background information, explains the rationale for the study and requesting participation from stakeholders to assist DWS to ensure sufficient water resource availability for the study area until 2040.

The Professional Service Provider (PSP) appointed to undertake the study consists of: Batatise Consulting Engineers in association with UWP Consulting and WRP Consulting Engineers.

Should you require more information on this Study, please contact us.

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Context and study area

The Department of Water and Sanitation has commissioned a three-year study (2018 – 2020) for the continuation of the Integrated Vaal River System Reconciliation Strategy Study – Phase 2. The initial strategy for the Vaal River System was developed in 2009 with the main objective to reconcile the current and future water requirements with the available water by implementing appropriate interventions to increase the available water, conserve water through conservation and demand management measures as well as improve the water quality in the river systems.

The strategy developed in 2009 has been implemented, monitored and updated over the 2010-2015 period to ensure that it remains relevant under prevailing conditions. This study is part of an on-going process to ensure the relevance of management of the Integrated Vaal River System to confirm sufficient water availability. The DWS works closely with the Strategy Steering Committee (SSC) to implement the strategy, maintain its relevance and to continue to ensure efficient planning.

Study Area

The study area comprises the water resources of the Vaal River System which includes the catchments of the Upper, Middle and the Lower Vaal Water Management Areas (WMAs) – from Kuruman in the west to Ermelo in the east and Johannesburg in the north to the Lesotho border in the south. Other sub-systems that also form part of Integrated Vaal River System or are linked to the Vaal River System are indicated on the map – see page 6.

Considerable variations in climatic conditions occur over the three WMAs. The Mean Annual Precipitation (MAP) decreases from 800 mm in the Upper Vaal to 500 mm in the Middle Vaal and 100 mm in the Lower Vaal WMA. This tendency is reversed when considering potential annual evapotranspiration, which increases from 1300 mm in the Upper Vaal to 2800 mm in the Lower Vaal WMA. The land use in the Upper Vaal WMA is characterised by the sprawling urban and industrial areas in the northern and western parts of the WMA. There is also extensive coal and gold mining activities located in the Upper Vaal WMA. These activities are generating substantial return flow volumes in the form of treated effluent from the urban areas and mine dewatering that are discharged into the river

system. These discharges are having significant impacts on the water quality in the main stem of the Vaal River, throughout all three the WMAs.

The Upper Vaal WMA is economically important, contributing nearly 20% of the Gross Domestic Product of South Africa, which is the second largest contribution to the national wealth amongst all of the WMAs in the country. The potential for future economic growth in this WMA remains strong. Growth will largely be attracted to the already strong urban and industrial areas in the Johannesburg-Vereeniging-Vanderbijlpark complex.

System Balance for Target Reconciliation Scenario (June 2015)

The system balance for the target reconciliation scenario from the Continuation of the Integrated Vaal River System Reconciliation Strategy Study (PHASE 1) is presented in **Figure: 1**.

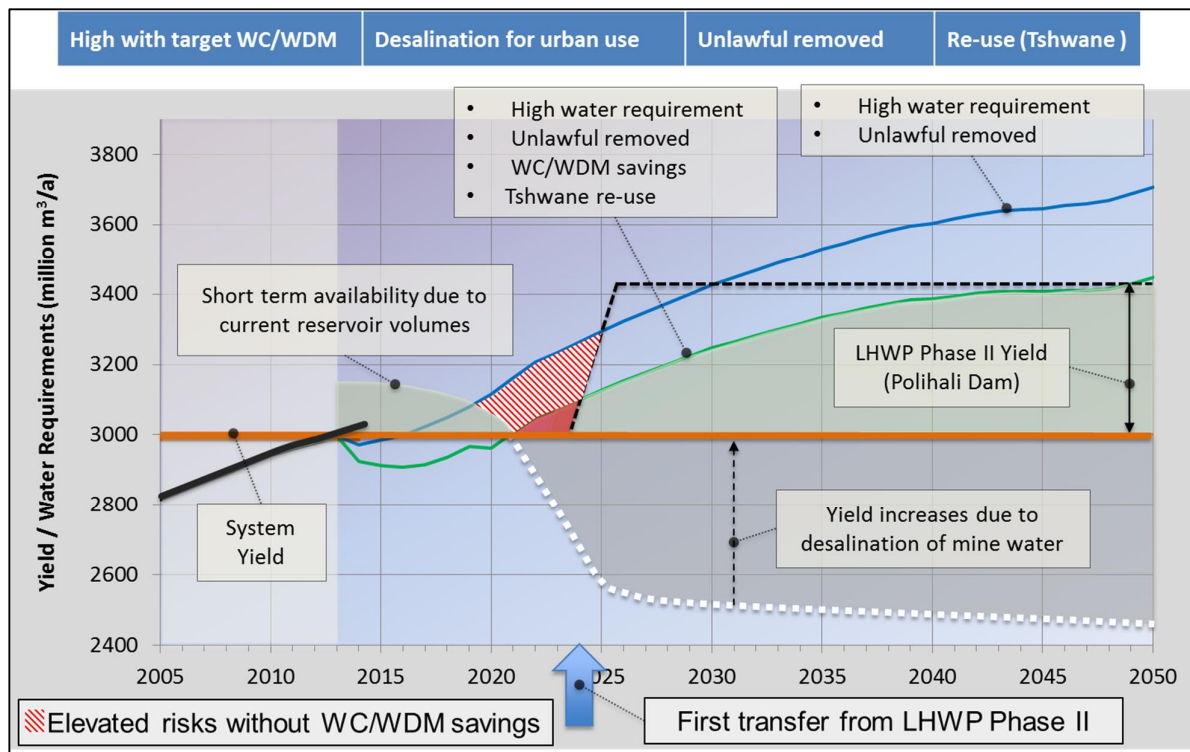


Figure 1: System balance for target reconciliation scenario (June 2015)

Based on the presented results, the previous phase of the study concluded that Water Conservation and Water Demand Management (WC/WDM) (Project 15%), eradication of unlawful water use in the irrigation sector, desalination of mine water and the re-use of water (Tshwane Project) are essential interventions to limit the risk of drought restrictions until the Lesotho Highland Water Project (LHWP) Phase 2 can be implemented in the year 2024.

The risk of needing to implement drought restrictions in the Vaal River System will increase until Phase 2 of the LHWP can deliver water into Vaal Dam. Appropriate preparedness plans need to be put in place in all sectors and at all levels of the water supply chain to ensure consumption can be reduced when droughts occur as a measure to prevent complete failure in supply and before dams are depleted and empty.

This will be the foundation of the second phase of the study where assessments will be undertaken to update and improve the strategy to remain technically relevant.

Objective for the study

The objective with the second phase of the continuation of the Integrated Vaal River System Reconciliation Strategy is to update and improve the Strategy to remain technically relevant through:

- Technical assessments of aspects informing the water balance components and reconciliation interventions.

- Engagements with relevant authorities involved in the water cycle to promote and enable the implementation of strategy actions.
- Ensure the strategy is economically, environmentally viable as and socially acceptable.

Reconciliation Strategy Components

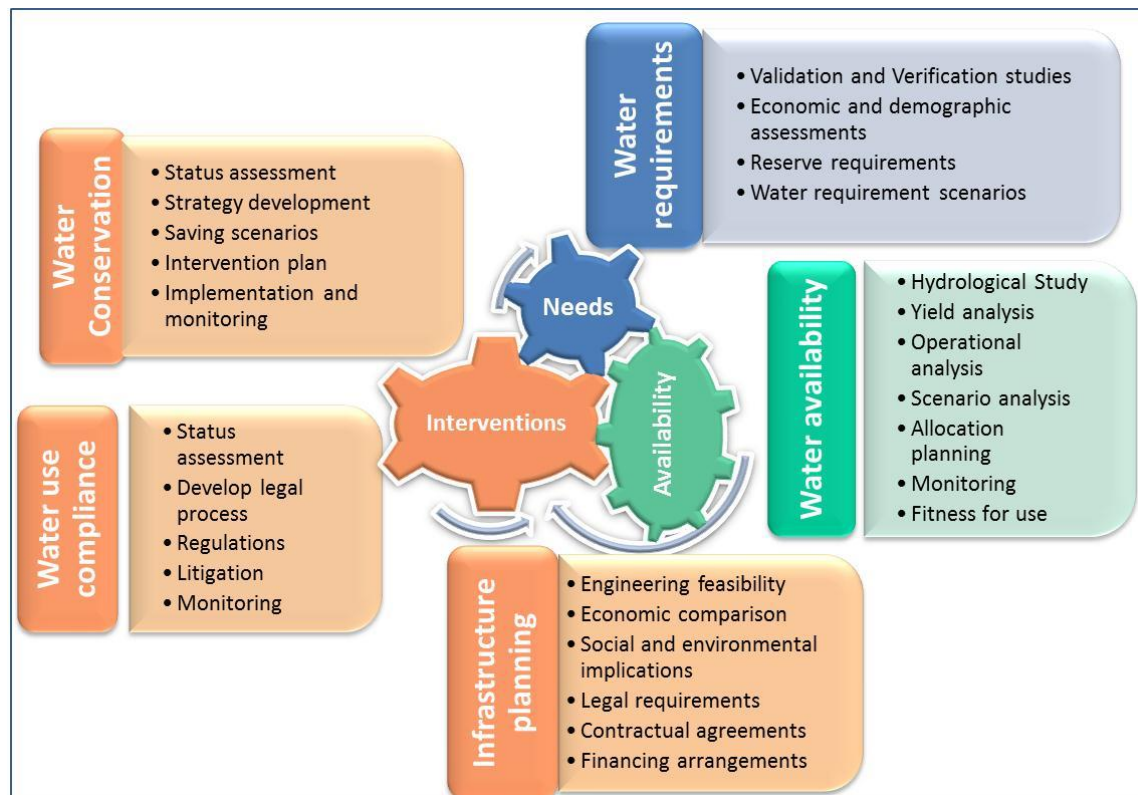


Figure 2: Components of a Reconciliation Strategy

Lessons learned from strategies being reviewed and implemented in other parts of the country identified the components shown in **Figure 2**, as the main elements to consider in a reconciliation strategy. At the centre of the diagram the questions regarding how much water is needed, what water resources are available or could be made available, and which interventions can be considered to achieve a balance between demand and supply should be answered.

The coloured boxes indicate how each question is answered by undertaking various investigations and synthesising the results of several processes to formulate the most suitable strategy and plan to reconcile the water resources with the requirements. The particular tasks and activities relevant to the continuation of the Reconciliation Strategy for the Integrated Vaal River System were identified from previous studies conducted, including the generic complements provided in **Figure 2** and are presented in the following section.

Study tasks

The study for the continuation of the Integrated Vaal River System Reconciliation Strategy – Phase 2 will be carried out in eight tasks, listed in the diagram below and briefly described in the sections below. Activities undertaken in the previous studies are the basis for the development of tasks during this study.

TASK 1: Inception and literature review

The objective of this task is to collate and review information that has become available some the previous study and to confirm the study scope and programme through the following activities:

- Finalisation and DWS approval of the study tasks scope, work processes and programme.

- Finalise the composition of the Study Administration Committee (SAM), Study Management Committee (SMC) and the Strategy Steering Committee (SSC).
- Agree on a training structure and training events.
- Review previous study reports and other available information documented since the previous study - focus on aspects that influence study tasks and strategy actions.

Deliverables:

- *Report 1: Inception Report*

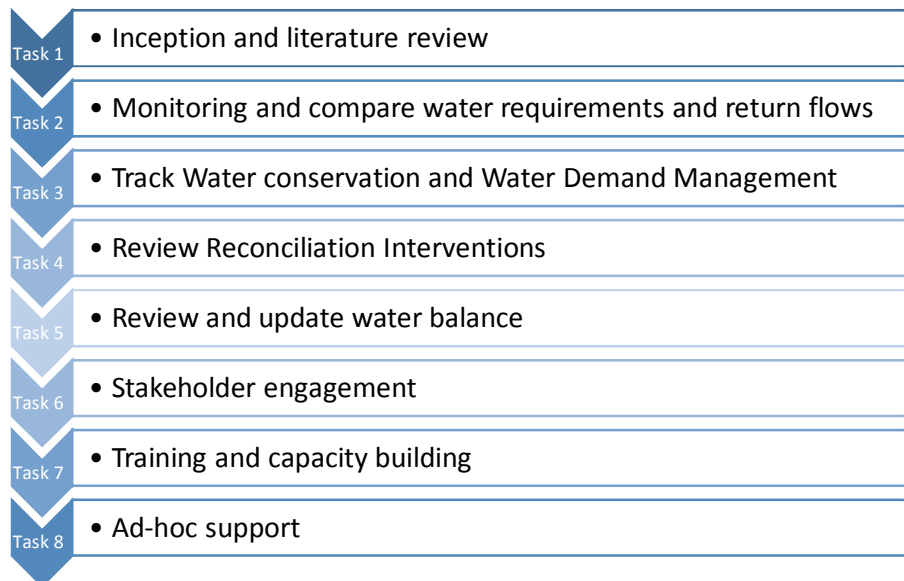


Figure 3: The particular tasks and activities relevant to the continuation of the Reconciliation Strategy for the Integrated Vaal River

TASK 2: Monitor and compare water requirements and return flows

This task will include two activities. The first will be completed during the first 12 month where historical water use and return flow data will be collated, recent demographic trends in the main urban centers will be compiled and compared with the Strategy Scenarios applied in the 2015 Status Report. The April 2017 Eskom projections will be evaluated to substantiate (or not) the reductions in water use from 2019 onwards. Recommendations will be made regarding the need to undertake a compressive update of water requirement and return flow scenarios.

The second activity will be carried out in the second and third years of the study, focusing on monitoring of the bulk water users (9 large municipalities monitored in the Annual Operating Analysis) and identify any significant deviations that may influence the strategy.

TASK 3: Track Water Conservation and Water Demand Management (WCWDM)

The objective of this task is to undertake a status quo of Water Conservation and Water Demand Management (WCWDM) in the key demand centers, provide conclusions and recommendations on the way forward based on the assessment results and arrange feedback sessions with the water services authorities for alignment. Key demand centres include City of Johannesburg, City of Tshwane, Ekurhuleni, Emfuleni, Lesedi, Midvaal, Randfontein, Mogale, Westonaria, Merafong, Rustenburg, Govan Mbeki, Matjhabeng.

TASK 4: Review Reconciliation Interventions

The objective of this task is to review and evaluate strategy reconciliation interventions based on the latest information available and assess the impact on the water balance and strategy the following reconciliation interventions will be evaluated:

- Bloemhof Dam excess utilisation investigation.
- Acid Mine Drainage (AMD) management option implementation monitoring of the Witwatersrand and KOSH (Klerksdorp, Orkney, Stilfontein and Hartebeesfontein) areas.
- Evaluate the need to activate further planning of Thukela Water Project if required

- Implications of reduced operational capacity on sustainable yield
- In addition to the above, progress will be tracked on the implementation of the other interventions namely
 - WCWDM
 - Eradication of unlawful irrigation
 - implementation programme of LWHP Phase 2
 - Planning in the Crocodile (West) and Olifants River system that may influence this Reconciliation Strategy

TASK 5: Review and update water balance

The objective of this task is to develop an updated water balance based on the results of Tasks 2 – Task 4. The following activities will be undertaken:

- Update projected annual water balance based on WRPM analyses (Task 4) for selected scenarios.
- Undertake alternative scenario analysis with WRPM if required.
- Undertake difference analysis to present the water balance implications of various future planning variables.
- Prepare information for the SSC Status Reports, presentation to stakeholder forums.

TASK 6: Stakeholder Engagement

The purpose of this task is to Provide stakeholders with meaningful information in order to assist them in providing useful contributions to the strategy and its implementation. Activities will include:

- Announcement of the study and revival of the Strategy Steering Committee (SSC)
- Prepare an updated Stakeholder Database
- Prepare media releases and newsletters
- Assist with web access arrangements
- Preparation and arrangement of six SSC Meetings to be held on a six-monthly basis during the study.

The role of the SSC is to:

- Provide executive guidance to the direction and outcomes of the study;
- Make available supplementary information and input from a local and regional perspective;
- Facilitate strategic linkages with other initiatives;
- Disseminate information from study into the relevant organisations;
- Incorporate strategies' recommendations into development plans such as IDPs etc;
- Ensure the implementation of the Strategy recommendations.

Task 7: Training and capacity building

The objectives of the training task are to capacitate DWS Staff and team members in specialist aspects specifically relating to the Integrated Vaal River System Reconciliation Strategy. Training and capacity building activities will be structured in the form of formal training and staff secondment in order for trainees to gain further hands-on experience in the technical processes and application of the models.

Task 8: Ad-hoc support

The objective of this task is to provide technical support to any additional ad hoc investigations that may be required during the study in support of the strategy.

Study management and administration

A key success factor for a multi-disciplinary study of this nature is the proper and co-ordinated management of the team. This is to ensure that all aspects of the study are adequately addressed by the appropriate staff and specialist(s) to the correct level of detail without losing focus of the essential holistic approach and without unnecessary duplication.

All activities will be monitored continuously to ensure that each one is completed on time and within budget. Provision has been made for Study Management Committee (SMC) and Study Administration Meetings (SAM) meetings to guide the day to day management of the study. All administrative and monitoring activities for the smooth running of the study form part of this task.



6