

Development of the Limpopo Water Management Area North Reconciliation Strategy

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INTRODUCTION

This first edition of the Newsletter provides a summary on the progress towards the development of a Reconciliation Strategy for the Limpopo Water Management Area (WMA) North to date, as well as the way forward.

The associated Background Information Document, available under "Reports and Documents" on the DWS Project website

<https://www.dwa.gov.za/Projects/Limpopo/>), introduced the Study Area, the objectives of the study and description of the study tasks. The main objective of this assignment is to formulate a water resource reconciliation strategy for the entire Limpopo WMA North (defined as the Limpopo WMA in the first *National Water Resources Strategy*, 2004) up to 2040. The Reconciliation Strategy should:

- address growing water demands as well as water quality problems experienced in the catchment;
- identify resource development options; and
- provide reconciliation interventions, structural and administrative / regulatory.

The dry Limpopo WMA North is the most northern WMA in South Africa and forms part of the internationally shared Limpopo River Basin. The Study Area comprises of six main river catchments, namely the Matlabas, Mokolo, Lephalala, Mogalakwena, Sand and Nzhelele. The very small Nwanedi River catchment forms part of the Nzhelele River catchment for the purpose of this study. The Study Area is shown in **Figure 1**.

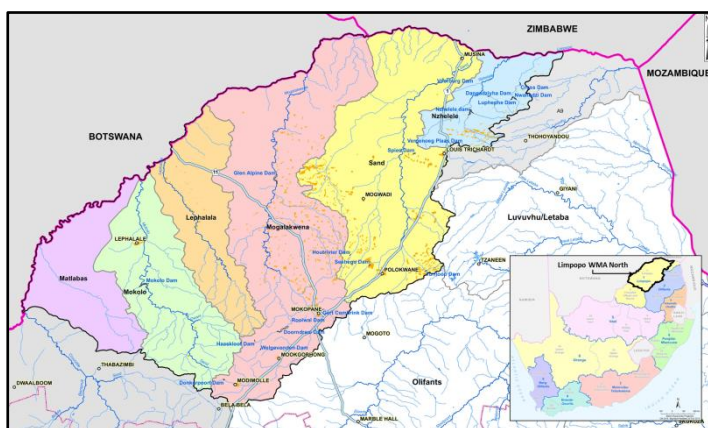


Figure 1 Limpopo Water Management Area (WMA) North (Study Area)

The main urban areas within the WMA include Mokopane, Polokwane, Mookgophong, Modimolle, Lephalale, Louis Trichardt and Musina.

Approximately 760 rural communities are scattered throughout the area, mostly concentrated in the central region. The main economic activities are irrigation and livestock farming, however, mining operations and industrial areas, e.g. the Special Economic Zone (SEZ) and Limpopo Eco-Industrial Park (LEIP), are expanding and due to the vast untapped mineral resources in the area. The water resources, especially surface water resources, are heavily stressed due to the present levels of development. It is crucial that water supply is secured and well managed.

Figure 2 shows the coordination of the technical process and stakeholder engagement process through Study Steering Committee (SSC) meetings. The information emanating from the various technical tasks are discussed with key stakeholders at these SSC meetings, documented in a suit of study reports and published on the DWS Project website.

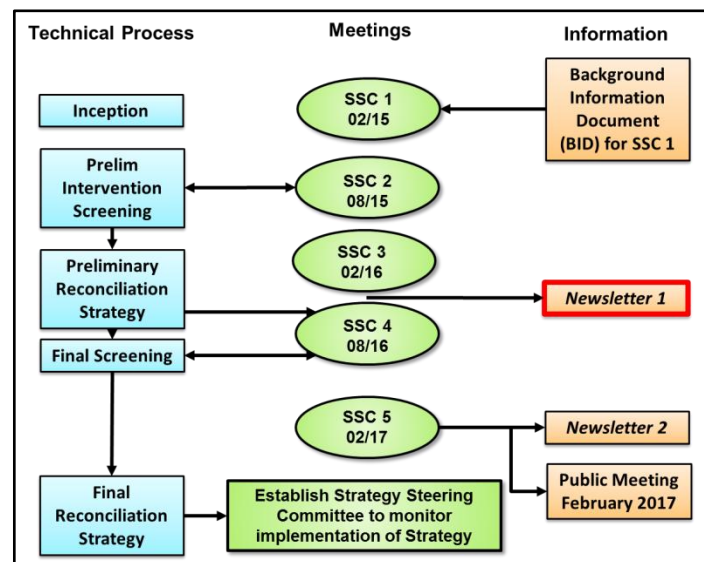


Figure 2 Interaction between the Technical Process and the Study Steering Committee

This Newsletter follows the SSC Meeting 3, and summarises the progress made to date with the development of the Reconciliation Strategy.

The following **preliminary dates and locations** were proposed for the final two SSC meetings:

- SSC Meeting 4 – Preliminary Reconciliation Strategy: **22 September 2016** in Musina
- SSC Meeting 5 – Final Reconciliation Strategy: **2 February 2017** in Polokwane

OVERVIEW OF STUDY PROGRESS

All work required to determine the status quo of the Study Area has been completed. This includes *inter alia*:

- Hydrological analyses;
- Current and future water requirements;
- Water quality assessment;
- Groundwater assessment;
- Water resources yield analyses (WRYM) and planning analyses (WRPM); and
- Water conservation and water demand management (WC/WDM) status.

The **Screening Workshop Starter Document** was produced and distributed to stakeholders prior to the second SSC Meeting to provide information on the preliminary intervention options that were identified. These intervention options, both requirements focused and water resources focused, were sources from previous water resources related studies, as well as Reconciliation Strategies from neighbouring WMAs.

The following typical intervention options were identified as part of the preliminary intervention screening process:

Resource focussed interventions

- Groundwater development;
- Water re-use (wastewater reclamation);
- Augmentation schemes (e.g. inter-catchment transfers); and
- Surface water development (e.g. storage, river abstractions).

Requirement focussed interventions

- WC/WDM;
- Eliminating unlawful water use;
- Optimal system operation;
- Removal of IAPs;
- Transfer of water allocations (Section 25 of Water Act); and
- Compulsory licensing;

All preliminary intervention options were presented at the second SSC meeting held on 18 August 2015, to provide stakeholders with the opportunity to:

- Share their views on the previously identified intervention options;
- Identify the intervention options that should be considered for further investigation, as well as the level of investigation required; and
- Add additional options where applicable.

Subsequent to the second SSC meeting, feasible intervention options were selected for further investigation. These intervention options will be further evaluated based on certain criteria, including parameters such as high level estimated capital and operational costs, Unit Reference Values (URVs), socio and biophysical impacts.

The current and future water requirements and the intervention options selected for further investigation are discussed below.

CURRENT WATER USE AND FUTURE WATER REQUIREMENTS

The total 2010-development level water requirement in the Study Area is 616.4 million m³/a. The current water use per sector in the Study Area is illustrated **Figure 3**. The irrigation sector is the dominant water user, accounting for more than 80% of the total water requirement.

The expected water requirements (high growth scenario) from 2010 to 2040 for the Study Area are shown in **Figure 4**.

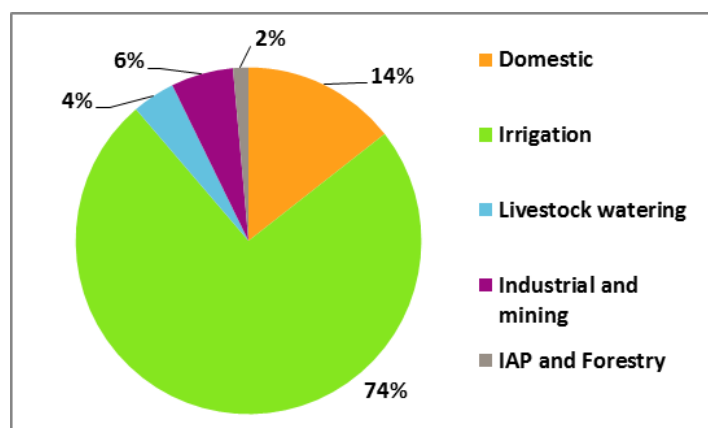


Figure 3 Current water use per sector

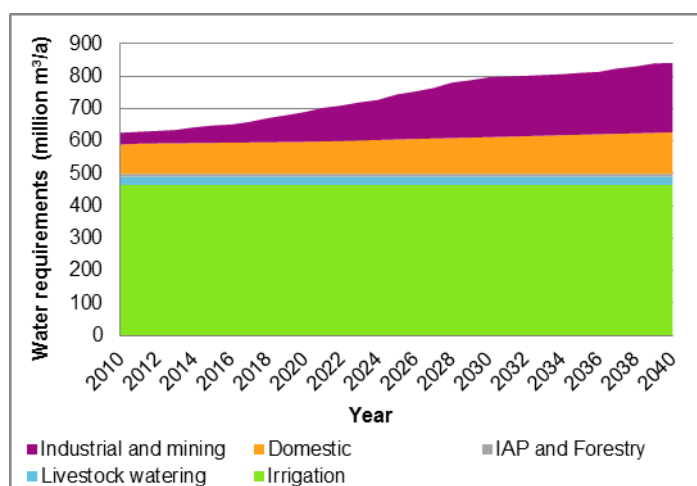


Figure 4 Future water requirement projections

The Study Area water balance is shown in **Figure 5**.

Water augmentation options that are currently in the construction phase or that are progressed in terms of design and implementation are included in the water balance.

These include the *Mokolo Crocodile Water Augmentation Project* (MCWAP), *Olifants River Water Resources Development Project* (ORWRDP) and the transfer of water from the Nandoni Dam in the Luvuvhu/ Letaba catchment to Louis Trichardt and surroundings.

With reference to **Figure 5**, it can be concluded that the projected water requirements will be reconciled with the projected water availability for the planning horizon of up to 2030, with some shortage between 2012 and 2018.

However, it should be noted that this does not apply to all the individual catchments – some catchments may have a surplus and others a significant water shortage. It was therefore, decided to evaluate the water balance of each catchment individually, and where necessary individual supply areas.

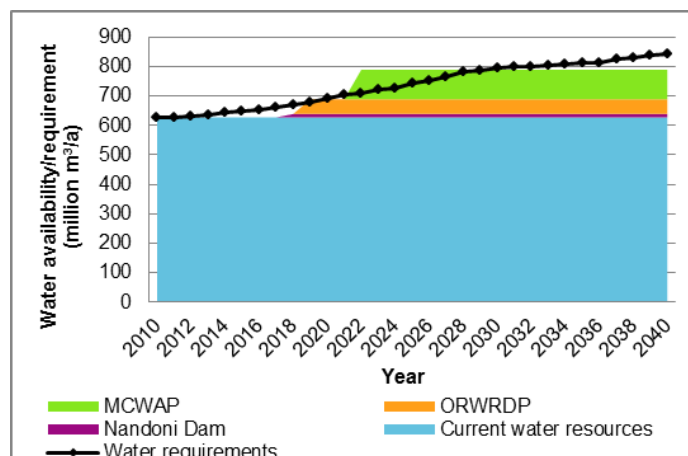


Figure 5 Water balance of the Study Area

MAIN INTERVENTION OPTIONS

The typical intervention options that were considered for further evaluation were divided into two groups, namely requirement focused and resource focussed.

REQUIREMENT FOCUSSED OPTIONS

These intervention options focus to either reduce the water requirement or to use water more efficiently.

WC/WDM

WC/WDM entails the more efficient use of water, including adequate monitoring of water distribution networks, reduction of non-revenue water, reduction of water losses due to insufficient water supply infrastructure, etc.

The domestic sector in urban areas will benefit the most from WC/WDM. Increased water use efficiency in the irrigation and mining sector are in most cases driven by the owner and saved water will likely be applied to expand operations. Institutions, such as district and local municipalities, water boards, other water services providers, and water user associations, will be assessed on the progress with regard to their WC/WDM activities. Where not yet developed or implemented, strategies to increase water use efficiency will be recommended.

Eliminating unlawful water use

Unlawful water use, especially within the irrigation sector, is a concern in the Study Area and must be urgently addressed. The exact unlawful expansion in irrigated area and the associated water use, however, can only be confirmed after the completion of the *Validation and Verification Study for the Limpopo WMA* currently in progress. Furthermore, alternatives to meet the water requirements of these unlawful users should be considered, i.e. to turn these users into lawful.

Other

Other considered requirement focussed intervention options include optimal system operation, removal of invasive alien plants, transfer of water allocations and compulsory licensing.

RESOURCE FOCUSSED OPTIONS

These intervention options focus on increasing the water availability.

Groundwater development

The majority of the rural communities are currently supplied by groundwater. Areas will be identified where possible regional groundwater schemes can be developed based on associated water requirements, groundwater exploitable potential and water quality. Some groundwater developments in the Study Area include:

- **Matlabas:** Supply to Boikarabelo Coal Mine and Power Station and possibly Glenover Mine;
- **Mokolo:** Supply of rural domestic water requirements;
- **Lephalala:** Supply to Ga-Phahladira cluster area and Ga-Seleka area;
- **Mogalakwena:** Aganang Bulk Water Supply Schemes (BWSS) Phase 1 and supply of rural domestic water requirements;
- **Sand:** Rehabilitation of GW resources in Polokwane LM and supply of rural domestic water requirements in the Mogwadi area; and
- **Nzhelele:** Nzhelele Valley BWSS and supply of rural domestic water requirements.

Surface water development

Local augmentation options proposed or investigated, including inter-catchment transfers, are:

- Transfer from Glen Alpine Dam (Mogalakwena) to Molemole West supply area (Sand);
- Domestic supply from Nzhelele Dam and raising of Mutshedzi Dam to supply Nzhelele area (Nzhelele Valley BWSS);
- Domestic supply from Luphephe and Nwanedi twin dams (Luphephe and Nwanedi Regional Bulk Water Supply); and
- Possible dam on the Mutamba River (Nzhelele) to supply future coal mines.

Transfer schemes from adjacent WMAs

A number of transfer schemes have been identified, of which some are already being constructed. These include:

- *Crocodile and Mokolo Water Augmentation Project (MCWAP)*: Transfer from the Crocodile (West) River to Lephalale (Mokolo) - Phase 1 construction completed and Phase 2A construction to start soon;
- Magalies Water transfer from Klipvoor Dam or Roodeplaat Dam (Crocodile River catchment) to Modimolle and Mookgopong (Mogalakwena) – currently at feasibility design level;
- *Olifants River Water Resources Development Programme (ORWRDP) Phase 2B & 2G*: Transfer from Flag Boshielo Dam (Olifants River catchment) to Mogalakwena LM (Mogalakwena) – Detail design completed, construction of Phase 2B to start soon.
- Nandoni Dam (Luvuvhu River catchment) transfer to Makhado LM and Matoks area (Sand) – First phase of pipeline currently being constructed.
- Possible transfer from Vondo Dam or other dams in the Luvuvhu River catchment to Nzhelele Valley area – to be investigated.

Water re-use (wastewater reclamation)

Water re-use involves the use of treated effluent from waste water treatment works (WwTW) either directly or indirectly for potable and non-potable supply.

The Mogalakwena Platinum Mine currently receives treated effluent from Mokopane and Polokwane for non-potable purposes. Various WwTW are planned to be upgraded and of which the treated effluent can potentially be reused. These include:

- Marapong WwTW: 16 Ml/d upgrade to supply effluent to Boikarabelo Power Station and Mine (*Marapong-Boikarabelo Effluent Transfer, MBET*);
- Polokwane Regional WwTWs (incl. Polokwane, Mankweng and Seshego WwTW): Includes the 6 Ml/d upgrade of the Polokwane WwTW and provision of additional treatment capacity of 100 Ml/d by 2044. Additional effluent will be re-used in Polokwane LM.
- Louis Trichardt WwTW: A new WwTW has been constructed to relieve old facility. Treated effluent can potentially be directly reused in the Louis Trichardt or Makhado for non-potable purposes, however, this should still be investigated.

DEVELOPMENT OF THE FINAL RECONCILIATION STRATEGY

STRATEGY DEVELOPMENT PROCESS

The main intervention options, discussed above, will be further evaluated based on the following criteria:

- The capital cost required to implement the option;
- The operational cost of implementing the option;
- The unit reference values (URVs);
- The social impacts;
- Biophysical impacts;
- The management intensity of the option; and
- The time required for implementation.

Based on the outcome of the above, the *Preliminary Reconciliation Strategy* will be compiled to define the proposed actions and interventions that will be required to make sufficient water available to supply the water requirements in the Study Area up to 2040. Stakeholders will have the opportunity to provide their input, after which the *Final Reconciliation Strategy* will be compiled.

STAKEHOLDER ENGAGEMENT

Stakeholders representing all relevant sectors in the Limpopo WMA North were identified and invited to nominate or serve as an SSC stakeholder. Three SSC meetings have been held to date.

At the 4th SSC meeting, the *Preliminary Reconciliation Strategy* will be presented (the document will be distributed beforehand), and members will be provided the opportunity to comment on and review the strategy for finalisation.

The Study will be concluded with a public meeting (5th SSC meeting) where the Final Reconciliation Strategy will be presented and stakeholders will be invited to share views and agree on the most favourable future reconciliation options and sequence of implementation and planning priorities.

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