

Development of a Reconciliation Strategy for the Luvuvhu and Letaba Water Supply System

Background Information Document - 3

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water affairs

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PURPOSE OF THIS DOCUMENT

This background information document (BID) provides information on the development of a Reconciliation Strategy for the Luvuvhu and Letaba Water Supply System and provides a summary of some of the information that will be presented at the third Study Steering Committee meeting that will be held on 31 October 2012.

A Reconciliation Strategy identifies, prioritises and confirms the interventions required to reconcile the water requirements with the available water resources in a catchment or water system at current and future development levels.

You are invited to contact the public participation office or the technical team at the addresses provided below for more information about this study and to find out when the next meeting will be held.

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STUDY AREA

The Luvuvhu and Letaba Water Supply System is located in the north-east of the Limpopo Province with Zimbabwe to the north and Mozambique to its east. Major towns in the study area include Thohoyandou, Giyani and Tzaneen. The Kruger National Park comprises about one third of the study area.

The water resources in this area can in general be described as fully utilised. The demand for water from the Letaba River already exceeds its yield capability. Regulation of water flow in the Letaba System is mainly provided by Middle Letaba, Ebenezer and Tzaneen Dams. The Luvuvhu River has the Nandoni, Albasini, Vondo and Damani dams which will soon be fully utilised. The major rivers in the area are the Luvuvhu, Letaba, and Shingwedzi rivers which all flow in an easterly direction through the Kruger National Park and into Mozambique.

The area under investigation is the entire Luvuvhu and Letaba Water Management Area (WMA) and parts of the adjacent WMAs. The main objectives of the study are to develop water availability assessment tools and to formulate water resource reconciliation strategies that will ensure sufficient water up to the year 2040.

WORK DONE THUS FAR IN THE STUDY

The study has been divided into various tasks and here follows a summary of work done thus far:

- Task 1: A Summary Report of information available from previous and current studies has been completed.
- Task 2: The Preliminary Screening Workshop was held on 25 April 2012 and intervention options presented by the study team were evaluated.
- Task 3: The hydrological analysis has advanced according to schedule. Reliable information on mainly irrigation is not available from the validation study and further work in this regard is required.
- Task 4: Population figures have been determined to be used as basis in determining water requirements and return flows in the urban sector.
- Task 5: The development of water conservation and water demand management strategies for the urban/rural sector was completed and will be discussed in great detail later in this document. Draft strategies and business plans have been distributed and presented to municipalities.
- Task 6: The water re-use component of the study is almost completed and the first draft report should be available soon. The progress on this task was however hampered by poor data in the study area.
- Task 8: The draft water quality report was submitted for internal comment. These comments were included and the final draft copy is now ready for external distribution and comments.
- Task 15, the review of schemes and update of cost estimates has recently commenced. The other tasks not mentioned above will commence during the next few months and the study is on track to be completed on time.

The following topics will be presented and discussed at the Study Steering Committee (SSC) meeting on Wednesday, 31 October 2012:

SUMMARY OF INTERVENTION OPTIONS

Possible intervention options to balance the available water (yield) with the current and future water requirements were identified at the first screening workshop and SSC meeting held on 25 April 2012. These include management and possible infrastructure developments which will be

summarised in a brief presentation for the benefit of SSC members.

The intervention options will be evaluated and compared during the study and serve as building blocks for the development of the Reconciliation Strategy.

DEMOGRAPHIC SCENARIOS

The population and economic future growth and distribution scenarios form the basis of determining the possible future water needs of the area. Base population figures were compiled and utilised together with growth scenarios to determine a moderate and high growth scenario for each of the settlements. These settlements have been grouped according to water supply schemes as

well as municipalities. The possible economic growth in each of the major towns was determined for industrial and commercial land use and the results provided in terms of take-up of hectares.

A summary of the methodology and results will be briefly reported on at the SSC meeting.

RAINFALL ANALYSIS

A rainfall analysis is the first step in developing a high confidence hydrological database which is the backbone to reliable water available determinations (yield analysis). Rainfall data were prepared for the study area and will be applied in the rainfall runoff models to produce monthly

surface runoff records for all the sub-catchments.

The rainfall analysis and related draft report was completed and the results will briefly be reported on at the SSC meeting.

WATER QUALITY AND WATER RE-USE

The available surface water quality and point source discharge data in the study area was collated and assessed. The water users were identified in the catchment and the water quality requirements of the various users determined using the South African Water Quality Guidelines. These were used as a basis against which to compare the measured in-stream water qualities to determine the water quality variables of concern. The water quality variables of concern identified were elevated nutrient concentrations; in particular phosphorus in sections of the rivers downstream of urban area and intensive irrigation areas. Bacterial pollution was also identified and raised as a concern in sections of the river. The bacterial pollution is associated with urban runoff and wastewater treatment plant discharges. The salinity related water quality variables generally meet the water quality guidelines set for the river

system. There are exceedances of the sodium and chloride water quality guidelines in the lower reaches of the Groot Letaba River.

The available water quality and effluent discharge information was collated for the wastewater treatment works. The datasets were limited; in particular the discharge volumes. The Green Drop datasets were used to assess the re-use potential. The majority of the treatment plants are less than 2 ML/d in capacity. These plants are generally oxidation ponds or bio filters. The larger plants in Tzaneen and Makhado are activated sludge plants. The largest plant is the 10 ML/d activated sludge Waterval works in Makhado. The sewage discharges are not large and are utilised downstream so the potential for specific re-use schemes of treated effluent to contribute significantly to reconciliation is low.

WATER CONSERVATION AND WATER DEMAND MANAGEMENT

As part of the development of the overall Luvuvhu Letaba Reconciliation Strategy, the water conservation / water demand management (WC/WDM) component of the study focused on the following key aspects:

- Preparing a baseline of current water losses and potential savings in the Luvuvhu Letaba WMA;
- Completing WC/WDM performance score cards to identify strengths, weaknesses, opportunities and threats;

- Identifying potential interventions, complete with budgets and time lines;
- Preparing water balance diagrams for the municipalities under investigation complete with system yields versus demand curves with and without WC/WDM; and
- Developing high level WC/WDM strategies and business plans for the municipalities within the Luvuvhu-Letaba WMA.

STATUS QUO REVIEW

The status quo review revealed critical challenges in the key demand centres which pose an impediment to service delivery and negatively impact on the implementation of WC/WDM in the WMA. The challenges noted included high vacancy levels in the WSA's and WSP's, limited technical capacity and skills, poor communication between the technical and financial departments at the WSP level, uncoordinated tariff setting and cost recovery processes, a general lack of consumer engagement and participation and most importantly; poor quality and availability of macro and micro management information.

RECOMMENDATIONS

In view of these critical challenges, the following recommendations are made:

From an **institutional** perspective, a key strategy will be to address the considerable vacancies or shortages in human resources and skills. Dedicated individuals or sections ideally should be established in order to drive WC/WDM. Specialised training in WC/WDM is pertinent to support the municipal personnel in undertaking the required water loss reduction activities particularly at the management level where guidance and leadership are required to drive demand management.

It is also crucial that the lines of communication are opened between the different municipal departments in order to aid more efficient access to information which will allow for more effective and coordinated planning. A Non-Revenue Water (NRW) steering committee comprising the relevant councillors, finance representatives, communication and the technical department can be established to facilitate improved reporting and management of NRW.

To address the **social** pillar of demand management, extensive and continuous consumer water education programmes are required which will focus on the community and other key water users including agricultural users and institutions such as schools, which are potent avenues for the reduction of water losses.

Structures should also be put in place to support consumers in reporting leakage and other service related complaints which should be captured electronically in order to allow proper tracking and analysis of water loss contributors and significant problem areas.

The political leadership should ideally lead these interventions and provide substantial support in order to improve the sustainability of the community based interventions.

Financial interventions should include the prioritisation and budgeting for WC/WDM. The benefits from such a programme include water security, increased revenue for the municipality, job creation, improved customer relations, asset management and reduced water losses.

As a first step, meter audits should be undertaken for the non-domestic consumers in order to identify unmetered connections and non-functional meters which could in the short term significantly improve cost recovery.

Furthermore, it is imperative that the tariff setting process include inputs from the technical departments which could assist in making the tariffs increasingly effective in achieving the water use efficiency objectives.

In order to address the **technical** water loss challenges, measurement of the system input volumes as a first step, is required to come to grips with the extent of water losses in the WMA particularly, in the Mopani district.

The intermittent supply problems need to be resolved as a matter of priority as WC/WDM cannot be promoted if the consumer does not get a proper water supply. Intermittent supply also damages the water infrastructure and could result in water borne diseases.

Sectorisation and zone metering and monitoring are also required in the majority of the municipalities in the WMA to aid in the micro-management of the system once bulk metering has taken place.

Proper budgets must also be set aside for proactive infrastructure asset maintenance as the substantial maintenance backlogs have significantly compromised the functioning of the water supply systems.

Passive leak detection through community reporting would greatly enhance the ability of the WSP's to monitor the network and explore the potential for pressure management in selected areas experiencing high pipe burst frequencies.

There is a need to develop digital drawings of the network, which must be accompanied by the development of a comprehensive asset register that must incorporate critical information such as the age of the infrastructure, replacement period and cost as well as the location of the assets.

STAKEHOLDER ENGAGEMENT

Stakeholders

The identification of stakeholders in the study area is an on-going process. The DWA website for this study (www.dwa.gov.za/Projects/Luvuvhu/default.aspx) can be visited for more information regarding this study.

Study Steering Committee

Stakeholders representing specific sectors of society (e.g. agriculture, conservation, civil society as well as departmental officials) have been identified and asked to serve on a Study Steering Committee (SSC) for the duration (36 months) of this project. The SSC members oversee the study and provide strategic advice and guidance.

