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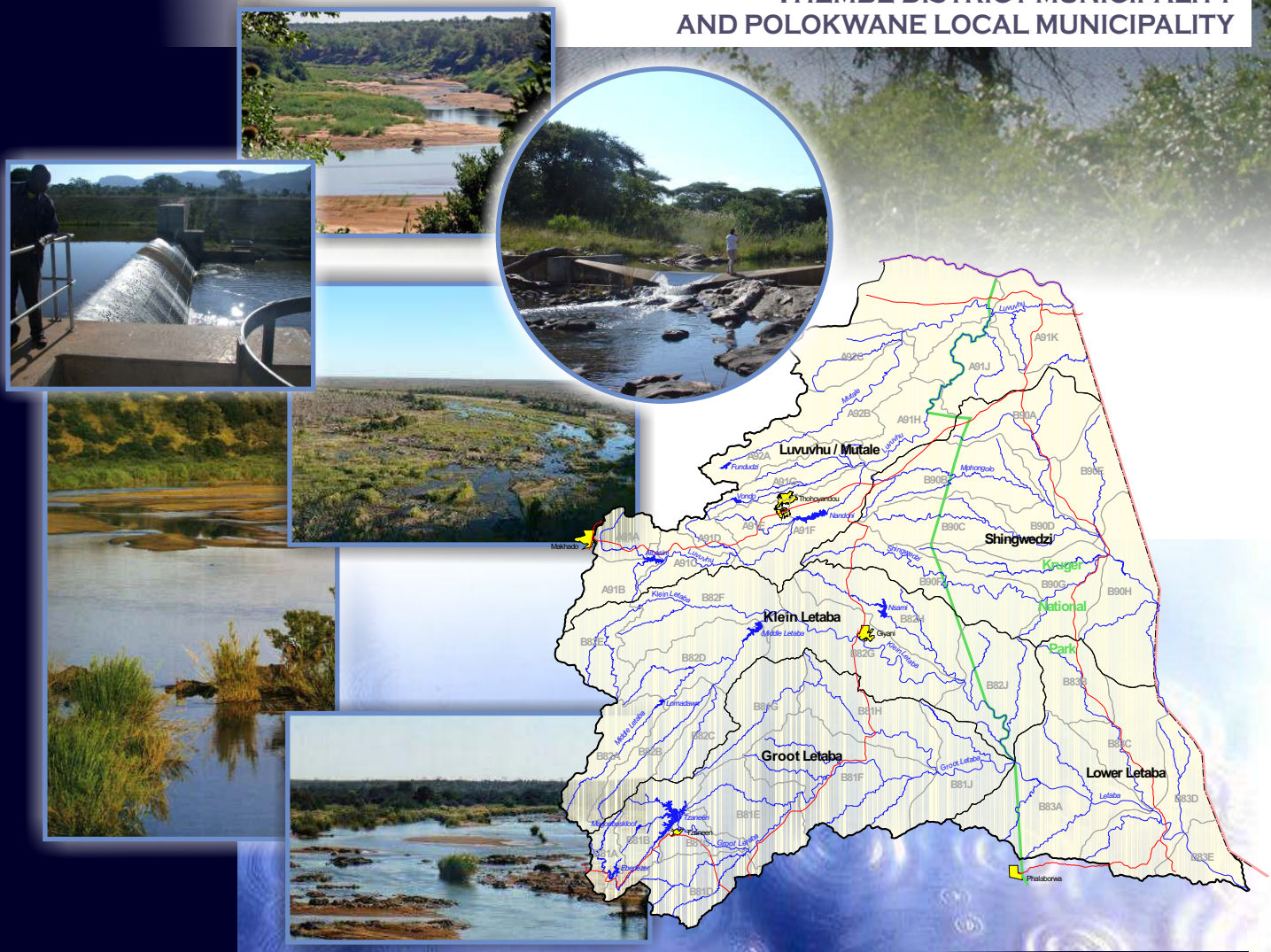
Development of a Reconciliation Strategy for the Levuvhu and Letaba Water Supply System

WATER CONSERVATION AND WATER DEMAND MANAGEMENT STRATEGY AND BUSINESS PLAN REPORT

VHEMBE DISTRICT MUNICIPALITY AND POLOKWANE LOCAL MUNICIPALITY



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DEVELOPMENT OF A RECONCILIATION STRATEGY FOR THE LUVUVHU AND LETABA WATER SUPPLY SYSTEM

Water Conservation and Water Demand Management Strategy and Business Plan Report

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Prepared by: Willem Wegelin

WRP Consulting Engineers

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Authors:	*WA Wegelin, N Zondo and Z Siqalaba*
Project Name:	***Development of Water of a Reconciliation Strategy for the Luvuvhu and Letaba Water Supply System (Vhembe District Municipality and Polokwane Local Municipality)***
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Approved for the Consultants by:

.....

P G van Rooyen

Study Leader

DEPARTMENT OF WATER AFFAIRS

Directorate: National Water Resource Planning

Approved for DWA by:

.....

T Nditwani

Chief Water Resource Planner:

(Project Manager)

.....

J A van Rooyen

Director: National Water Resource Planning

DEVELOPMENT OF A RECONCILIATION STRATEGY FOR THE LUVUVHU AND LETABA WATER SUPPLY SYSTEM

Water Conservation and Water Demand Management Strategy and Business Plan Report

EXECUTIVE SUMMARY

The Department of Water Affairs (DWA) has identified the need for the Reconciliation Study for the Luvuvhu-Letaba WMA. The WMA is almost fully developed and demands from the Letaba River currently exceed the yield capability of the system. Regulation for the Letaba WMA is mainly provided by Middle Letaba, Ebenezer and Tzaneen Dams. In the Luvuvhu WMA, the recently completed Nandoni Dam will be used in combination with Albasini, Vondo and Damani dams to be managed as one system. It is expected that the total yield from this combined system will be fully utilized by around 2020, considering only the current planned projected demands. The yield of the Albasini Dam has reduced over the years and as a consequence the dam is over allocated. The Shingwedzi catchment is situated almost entirely in the Kruger National Park and for all practical purposes no sustainable yield is derived from surface flow in the Shingwedzi catchment.

The main objective of the study is to compile a Reconciliation Strategy. This strategy will identify and describe water resource management interventions that may be grouped and phased to jointly form a solution to reconcile the water requirements with the available water for the period up to the year 2040. It will be used to develop water availability assessment methodologies and tools applicable to this area that can be used for decision support as part of future compulsory licensing. The development of the strategy requires reliable information on the water requirements and return flows (wastewater), as well as the available water resources for the current situation and likely future scenarios for a planning horizon of thirty years.

To achieve the above objectives, the following main aspects will be covered in the study:

- *Update the current and future urban and agricultural water requirements and return flows;*
- *Assess the water resources and existing infrastructure;*
- *Configure the system models (WRSM2005, WRYM, WRPM) in the Study Area at a quaternary catchment scale, or finer where required, in a manner that is suitable for allocable water quantification;*
- *To firm up on the approach and methodology, as well as modelling procedures, for decision support to the on-going licensing processes;*
- *To use system models, in the early part of the study, to support allocable water quantifications in the Study Area and, in the latter part of the study, to support on-going licensing decisions, as well as providing information for the development of the Reconciliation Strategy;*
- *Formulate reconciliation interventions, both structural and administrative/regulatory;*
- *Document the reconciliation process including decision processes that are required by the*

strategy; and
- *Conduct stakeholder consultation in the development of the strategy.*

WC/WDM

As part of the development of the overall Luvuvhu-Letaba Reconciliation strategy, the 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.*

The status quo review conducted for the WSAs revealed the following critical challenges existing in the key demand centres, which pose an impediment to service delivery and negatively impact the implementation of WC/WDM in the WMA.

Institutional

- *High vacancy levels in the technical departments;*
- *WC/WDM skills shortages, particularly at the operations and maintenance levels in the WSAs and WSPs;*
- *Limited training and capacity building to capacitate technical personnel;*
- *Limited support structures to enable the implementation of WC/WDM;*
- *Slow and unresponsive supply chain processes;*
- *Political constituencies that are ill equipped to support the achievement of improved service delivery;*
- *Inadequate or obscure channel of reporting and communication between the WSAs and WSPs; and*
- *Poor communication between the technical and financial departments at the WSP level.*

Financial
- *Uncoordinated tariff setting process;*
- *Tariffs set neither promote WC/WDM nor reflect the cost of water service provision; and*
- *Poor understanding of billing process due to limited communication.*

Social
- *General lack of consumer engagement and participation;*
- *Absence of coordinated consumer awareness programmes;*
- *Limited support structures to aid reporting of water related challenges; and*

- *A generally unhappy an uncooperative consumer base.*

Technical

- *Poor quality and availability of macro and micro management information;*
- *Limited bulk metering, sectorisation, zone metering and information analysis;*
- *Significant infrastructure upgrade backlogs;*
- *Limited proactive asset maintenance;*
- *High prevalence of illegal connections in the rural settlements; and*
- *Limited asset registers that do not fully incorporate or reflect the existing infrastructure.*

In view of the challenges noted above arising from the discussions held with the WSAs and WSP', the following recommendations are made:

Institutional Strategy

The key intervention for the WSAs within the Luvuvhu-Letaba WMA will be to address the considerable vacancies or shortages in human resources and skills. Ideally, dedicated individuals or sections should be established in order to drive Water Conservation and Demand Management. 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 is 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. In this regard, an NRW steering committee comprising of the relevant councillors, finance representatives, communication and the technical department can be established to facilitate improved reporting and management of NRW. Procurement processes during and after the transition period must also be streamlined in order to enable swifter access to support structures required for operations and maintenance tasks, which are necessary to mitigate water losses in the systems.

Social Strategy

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. The installation of water efficient devices, as well as rain water harvesting; are also avenues which can further be explored for promotion and implementation in different sectors. These devices can aid water loss reduction at the consumer level, particularly in areas where metering and billing cannot immediately be effected, and where cost recovery is very low due to high indigent populations. Structures should also be put in place to support consumers in reporting leakage and other service related complaints. The complaints 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 Strategy

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. National Treasury has been very vocal on the dependency of municipalities on grant funding. It has emphatically expressed the need for municipalities to actively demonstrate a commitment to proper budgeting, planning and cost recovery, with a focus on demand side management as a first step in managing and more effectively utilising the available resources. The aforementioned requires closer monitoring of consumers, particularly the top consumers, as well as an effective system to capture and refer billing related complaints and progressive payment of services in the municipalities, which must be supported and preceded by proper community awareness and education, and widespread public engagement.

Technical Strategy

As a first step, measurement of the system input volumes is required to determine the extent of water losses in the WMA, particularly in the Mopani District. Sectorisation and zone metering and monitoring is 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. The installation of meters is only the first step and will be altogether useless if the information is not captured and monitored on a monthly basis. Proper budgets must also be set aside for proactive infrastructure asset maintenance. There is a substantial maintenance backlog in the municipalities in the WMA, with a significant number of access challenges being caused simply by the age of the existing infrastructure. Passive leak detection through community reporting would greatly enhance the ability of the WSPs to monitor the network and explore potential for pressure management in selected areas experiencing high pipe burst frequencies. The location of infrastructure requires clarification in order to identify aspects of the network which are able to provide services to the consumers. There is a need to develop digital as-built drawings of the network which must be accompanied by the development of a comprehensive asset register incorporating critical information such as the age of the infrastructure, replacement period and cost, as well as the location of the assets. Through such interventions, substantial community-based employment can be created where indigent residents can be appointed and utilised to clean and locate the infrastructure.

Conclusion

Results from the study are summarised as follows:

- *There is a large part of the study area which has formal infrastructure, which enables effective metering and billing;*
- *The average consumption in the urban areas is very high and there is scope for reduction, which is expected to reduce the total demand and non-revenue water;*
- *The rural areas are characterised by intermittent supply with limited cost recovery and consumers revert to illegal connections to obtain water;*

- *The average consumption in the rural areas is within the acceptable range but there is huge inequality of supply. Any reduction will be redistributed with limited, or no reduction, in the total demand;*
- *The water tariffs in certain areas are not cost reflective and do not promote water conservation and water demand management;*
- *The municipalities lack funding to implement WC/WDM;*
- *The municipalities require additional staff to address and implement WC/WDM;*
- *Asset management lacks in some of the areas, which impacts on the assurance of supply; and*
- *Municipalities are grant dependant and have very high debtors.*

Based on the above, the following key strategic focus areas are recommended :

- *Raise WC/WDM awareness within the organisation by setting-up a WC/WDM task team, chaired by senior officials or MMC, to meet on monthly basis to address WC/WDM issues;*
- *Fill vacant positions and provide training and capacity building;*
- *Improve metering, reading, billing and cost recovery;*
- *Review the water tariff structure to be most cost reflective and promote WC/WDM;*
- *Improved tariff structures and cost recovery will increase revenue for the municipality which can be used to address the backlog in maintenance and improve service delivery;*
- *Implementing metering and cost recovery in the rural areas present several challenges and fixing internal plumbing leakage, using local plumbers, is recommended until such time as the system has stabilised and service delivery has improved;*
- *Implement awareness campaigns across all consumers to use water efficiently; and improve management information through proper monthly reporting and records keeping. These reports should be discussed at the monthly EXCO meeting.*

DEVELOPMENT OF A RECONCILIATION STRATEGY FOR THE LUVUVHU AND LETABA WATER SUPPLY SYSTEM

Water Conservation and Water Demand Management Strategy and Business Plan Report

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Acronyms

ACRU	Agrohydrological Modelling System
BID	Background Information Documents
CBO	Community Based Organisation
DA	Drainage Area
DM	District Municipality
DPLG	Department of Provincial and Local Government
DWAF	Department of Water Affairs and Forestry
EFR	Environmental Flow Requirement
EMA	Ecological Management Area
GIS	Geographical Information System
GRIP	Groundwater Resource Information Project
IAPs	Interested and Affected Parties
IFR	In Stream Flow Requirements
IWRM	Integrated Water Resource Management
LLRS	Development of Water of a Reconciliation Strategy for the Luvuvhu and Letaba Water Supply System
NGDB	National Groundwater Database
NGO	Non-Governmental Organisation
RWQO	River Water Quality Objectives
SAGDT	South African Groundwater Tool
SSC	Study Steering Committee
STW	Sewer Treatment Works
TDS	Total Dissolved Solids
URV	Unit Reference Value
WC/WDM	Water Conservation and Water Demand Management
WMA	Water Management Area
WRC	Water Research Commission
WRP	WRP Consulting Engineers (Pty) Ltd.
WRSS	Water Reconciliation Strategy Study
WRPM	Water Resources Planning Model
WRYM	Water Resources Yield Model
WSA	Water Service Authority
WSAs	Water Service Authorities
WSP	Water Service Providers

DEVELOPMENT OF A RECONCILIATION STRATEGY FOR THE LUVUVHU AND LETABA WATER SUPPLY SYSTEM

Water Conservation and Water Demand Management Strategy and Business Plan Report

1 INTRODUCTION

1.1 BACKGROUND

The Department of Water Affairs (DWA) has identified the need for the Reconciliation Study for the Luvuvhu-Letaba Water Management Area (WMA). The WMA is almost fully developed and demands from the Letaba River currently exceed the yield capability of the system. Regulation for the Letaba is mainly provided by Middle Letaba, Ebenezer and Tzaneen Dams. The recently completed Nandoni Dam located in the Luvuvhu basin will be used in combination with Albasini, Vondo and Damani dams, to be managed as one system. It is expected that the total yield from this combined system will be fully utilized by around 2020, considering only the current planned projected demands. The yield of the Albasini Dam has reduced over the years and as a consequence the dam is over allocated. The Shinwedzi catchment is situated almost entirely in the Kruger National Park and for all practical purposes, no sustainable yield is derived from surface flow in the Shingwedzi catchment.

The main urban areas in these catchments are Tzaneen and Nkowakowa in the Groot Letaba River catchment, Giyani in the Klein Letaba River catchment and Thohoyandou and Makhado (Louis Trichardt) in the Luvuvhu catchment. An emergency water supply scheme to transfer water from Nandoni Dam is currently under construction to alleviate the deficits of the stressed Middle Letaba sub-system in the Letaba River basin. Other future developments planned to be supplied from Nandoni Dam will utilize the full yield available from the Nandoni sub-system by 2021, without supporting Giyani. Supporting Giyani from Nandoni will bring this date forward to approximately 2018

Intensive irrigation farming is practised in the upper parts of the Klein Letaba River catchment (upstream and downstream of the Middle Letaba Dam), the Groot Letaba (downstream of the Tzaneen Dam) and Letsitele rivers, as well as in the upper Luvuvhu River catchment. Vegetables (including the largest tomato production area in the country), citrus and a variety of sub-tropical fruits such as bananas, mangoes, avocados and nuts are grown. Large areas of the upper catchments have been planted with commercial forests in the high rainfall parts of the Drakensberg escarpment and on the Soutpansberg. The area, particularly the Groot Letaba sub-area, is a highly productive agricultural area with mixed farming, including cattle ranching, game farming, dry land crop production and irrigated cropping. Agriculture, with the irrigation sector in particular, is the main base of the economy of the region. Large scale utilization of the groundwater resource occurs mostly downstream of the Albasini Dam in the Luvuvhu catchment, where it is used by

irrigators as well as in the vicinity of Thohoyandou where it is used to supply rural communities. The limited mineral resources in the Luvuvhu basin are dominated by deposits of coking (metallurgical) coal in the northeast near Masisi. In addition to irrigation water supply from the dams in the study area, the towns, villages and rural settlements are also supplied with potable water.

DWA and other institutions involved in the management of the water resource and supply systems of the Luvuvhu-Letaba catchments have, in the past, carried out various studies on intervention measures to improve the water supply situation. The knowledge base that has been created by these studies provides a sound and essential platform from which the Reconciliation Strategy will be developed. In order to harness this information a Literature Review Report (DWA, 2013) was compiled to summarise the available information in one document and also to present a synthesis of the information by highlighting the pertinent aspects of Integrated Water Resource Management that will be assessed and incorporated in the Reconciliation Strategy.

1.2 MAIN OBJECTIVES OF THE STUDY

The main objective of the study is to compile a Reconciliation Strategy. This strategy will identify and describe water resource management interventions that may be grouped and phased to jointly form a solution to reconcile the water requirements with the available water for the period up to the year 2040. It will be used to develop water availability assessment methodologies and tools applicable to this area that can be used for decision support as part of future compulsory licensing. The development of the strategy requires reliable information on the water requirements and return flows (wastewater), as well as the available water resources for the current situation and likely future scenarios for a planning horizon of thirty years.

To achieve the above objectives, the following main aspects will be covered in the study:

- Update the current and future urban and agricultural water requirements and return flows;
- Assess the water resources and existing infrastructure;
- Configure the system models (WRSM2005, WRYM, WRPM) in the Study Area at a quaternary catchment scale, or finer where required, in a manner that is suitable for allocable water quantification;
- To firm up on the approach and methodology, as well as modelling procedures, for decision support to the on-going licensing processes;
- To use system models, in the early part of the study, to support allocable water quantifications in the Study Area and, in the latter part of the study, to support on-going licensing decisions, as well as providing information for the development of the reconciliation strategy;
- Formulate reconciliation interventions, both structural and administrative/regulatory;
- Document the reconciliation process including decision processes required by the strategy; and
- Conduct stakeholder consultation in the development of the strategy.

1.3 STUDY AREA

The study area comprises of the water resources of the catchment of the Luvuvhu, Mutale, Letaba and Shingwedzi rivers linked to adjacent systems - as indicated by the inter-basin transfers on

Figure 1.1. This area represents the entire WMA 2 and includes tertiary catchments A91, A92, B81, B82, B83 and B90. Adjacent areas supplying water to this WMA or receiving water from this WMA are also part of the study area.

The Luvuvhu-Letaba WMA is located in the north-eastern corner of South Africa, where it borders on Zimbabwe in the north and Mozambique along the eastern side. It falls entirely within the Northern Province, and adjoins the Olifants and Limpopo WMAs to the south and west respectively. The Luvuhu-Letaba WMA forms part of the Limpopo River Basin, an international river shared by South Africa, Botswana, Zimbabwe and Mozambique.

Approximately 35% of the land area of the WMA along the eastern boundary falls within the Kruger National Park. The rivers flowing through the park are of particular importance to the maintenance of ecosystems.

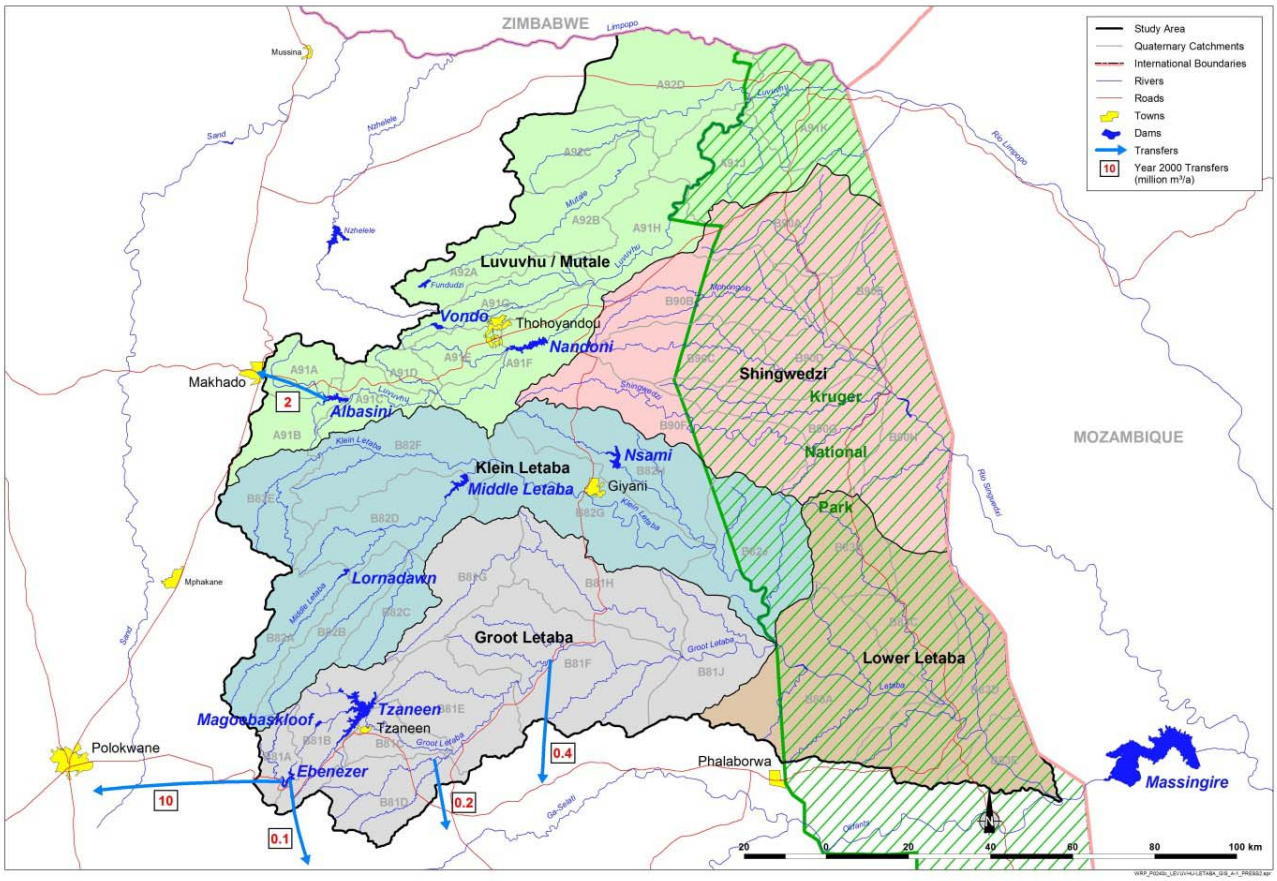

Figure 1.1: Study Area

The confluence of the Luvuvhu and Limpopo Rivers forms the common point where South Africa borders on both Zimbabwe and Mozambique. The Shingwedzi River first flows into the Rio des Elephantes (Olifants River) in Mozambique, which then joins the Limpopo River.

The two main branches of the Letaba River, the Klein and Groot Letaba, have their confluence on the western boundary of the Kruger National Park. The Letaba River flows into the Olifants River just upstream of the border with Mozambique.

The topography is marked by the northern extremity of the Drakensberg range and the eastern Soutpansberg, which both extend to the western parts of the water management area, and the characteristic wide expanse of the Lowveld to the east of the escarpment. Climate over the water

management area is generally sub-tropical, although mostly semiarid to arid. Rainfall usually occurs in summer and is strongly influenced by the topography.

Along the western escarpment rainfall can be well over 1 000 mm per year, while in the Lowveld region in the eastern parts of the water management area rainfall decreases to less than 300 mm per year and the potential evaporation is well in excess of the rainfall. Grassland and sparse bushveld shrubbery and trees cover most of the terrain, marked by isolated giant Boabab trees.

The geology is varied and complex and consists mainly of sedimentary rocks in the north, and metamorphic and igneous rocks in the south. High quality coal deposits are found near Tsikondeni and in the northern part of the Kruger National Park. The eastern limb of the mineral rich Bushveld Igneous Complex touches on the southern parts of the WMA. With the exception of sandy aquifers in the Limpopo River valley, the formation is of relatively low water bearing capacity. A wide spectrum of soils occurs in the WMA, with sandy soils being most common.

1.4 PURPOSE OF THIS REPORT

The purpose of this report is to document and to review the contents of water conservation and water demand management (WC/WDM) strategies developed by key Water Services Authorities (WSA). Based on the review, realistic estimates were made of the potential savings, cost implications and programme of implementation. This will form part of the development of possible future water demand projection scenarios.

The following specific WC/WDM task objectives to aid future planning in the Luvuvhu Letaba WMA were identified:

- Prepare a baseline of current water losses and potential savings in the Luvuvhu Letaba WMA;
- Complete WC/WDM performance score cards to identify strengths, weaknesses, opportunities and threats;
- Identify potential interventions, complete with budgets and time lines;
- Prepare water balance diagrams for the municipalities under investigation complete with system yields versus demand curves with and without WC/WDM; and
- Develop high level WC/WDM strategies and business plans for the municipalities within the Luvuvhu Letaba WMA.

The study area includes, or partly includes, the Water Services Authorities of Vhembe DM and Mopani DM as their associated local municipalities. Also included is Polokwane Local Municipality which receives water from this WMA. The study area is shown in **Figure 1.2**.

This task was undertaken as part of the DWA study titled *Development of a First Order Water Conservation and Water Demand Management Strategy and Business Plan for Various Municipalities under the DWA Rapid Response Programme - Limpopo Province*. By combining the results from the two studies, it was possible to cover all the municipalities within the two WSAs although these municipalities fall outside the official study area.

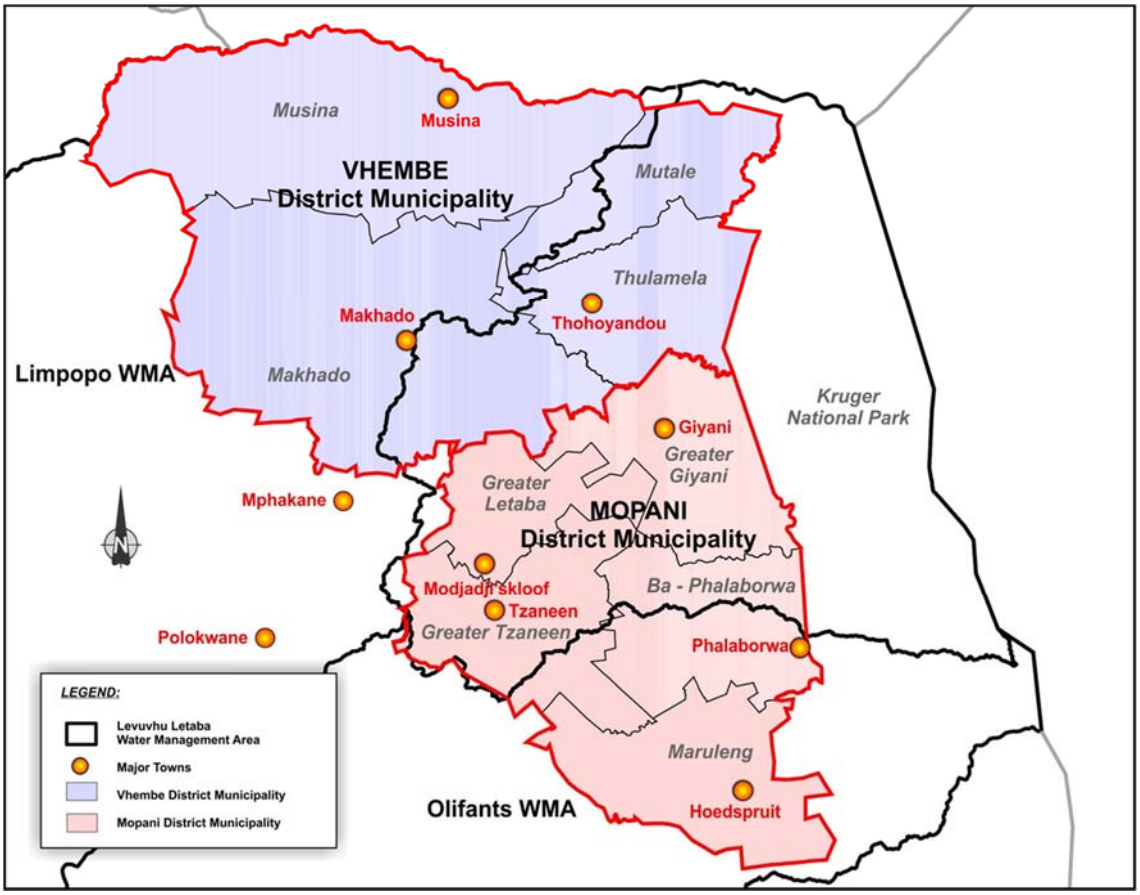

Figure 1.2: Location of District Municipalities

The municipalities investigated are shown in **Table 1.1** below.

Table 1.1: Summary of district and local municipalities included

Municipal Code	Municipality	Category	WSA
DC33	Mopani DM	C2	Yes
LIM331	Greater Giyani	B4	No
LIM332	Greater Letaba	B4	No
LIM333	Greater Tzaneen	B4	No
LIM334	Ba-Phalaborwa	B3	No
LIM335	Maruleng	B4	No
DC34	Vhembe DM	C2	Yes
LIM341	Musina	B3	No
LIM342	Mutale	B4	No
LIM343	Thulamela	B4	No
LIM344	Makhado	B4	No
DC35	Capricorn DM	C2	Yes
LIM354	Polokwane	B1	Yes

1.5 DEMOGRAPHICS

More than 80% of the population in the Luvuvhu Letaba WMA is rural based, with most living in informal and rural villages. The urban population is mostly found in towns such as Tzaneen, Nkowankowa, Giyani and Thohoyandou. The population figures as identified as part of the demographic component of this study are tabled in **Table 1.2.**

Table 1.2: Vhembe DM and Mopani DM Demographic Profile

ID	District Municipality	Local Municipality	Major city/town	Population	Households
DC33	Mopani	Greater Giyani	Giyani, Hluphekani	275 809	62 343
		Greater Letaba	Kgapane, Modjaji'skloof	268 398	63 087
		Greater Tzaneen	Tzaneen, Nkowankowa	392 426	92 138
		Ba-Phalaborwa*	Phalaborwa, Namakgale	155 599	39 484
		Maruleng*	Hoedspruit	108 449	25 811
	Sub total			**1 200 681**	**282 863**
DC34	Vhembe	Musina*	Musina, Nancefield	51 892	12 525
		Mutale	Mutale-Masisi	94 639	21 468
		Thulamela	Thohoyandou, Makwarela	616 711	141 724
		Makhado	Tshakhuma, Makhado	416 054	94 635
	Sub total			**1 179 296**	**270 352**
LIM354	Capricorn	Polokwane*	Polokwane	631 318	153 980
	Total			**3 011 295**	**707 195**

Source: Population figures from the Department of Water Affairs, Reconciliation Strategy for the Luvuvhu and Letaba Water Supply System – 2012 and * Water Infrastructure Status & Intervention Plans.

Note: (*) Represent municipalities outside the reconciliation study area but form part of the Water Services Authority.

Polokwane is the largest town in the study area with Mutale municipality having no major city as core. Thulamela municipality has the largest population of which most are rural.

2 STUDY METHODOLOGY

This project was undertaken in four main tasks, the details of which are discussed in the following sections.

2.1 TASK 1: COLLECT AND COLLATE PREVIOUS STUDIES

The WC/WDM component of the study combined the collection of both qualitative and quantitative data. NRW water balance data was obtained and consolidated from a variety of sources, including WSDP's, IDP's, Blue Drop – Green Drop Assessments, the MuSSA, as well as reports and data submitted by the municipalities. Preliminary WC/WDM status quo assessments were conducted with Polokwane Municipality as well as the Vhembe and Mopani Districts respectively, as the Water Services Authorities falling within the Levhuvhu Letaba WMA. Each of the local municipalities falling within the DMs and Polokwane were approached directly in order to obtain the required information.

The water authorities were requested to complete water balances and scorecards. The objective of the forms was to determine the status quo and if there is scope for water loss reduction in the supply systems. Both the water balance and scorecard have been developed by the project team for the Water Research Commission, and provide a high level assessment of the potential of WC/WDM in the area.

2.2 TASK 2: MUNICIPAL WORKSHOPS

The assessments under Task 1 were undertaken to gain a complete understanding of the existing water supply networks, their operation and key problems. This includes a brief review of the existing condition of the infrastructure, the operation of the system, levels of cost recovery and management practices.

The SABS 0306:1999 Code of practice for the Management of potable water in distribution zones provides guidelines on the management, administration and operational functions required by water services authorities in order to account for potable water within their distribution systems and to apply corrective actions to reduce and control water. The assessments conducted have been evaluated in terms of these guidelines to assess the scope for water loss reduction in the WMA.

Having reviewed the various existing information sources for each demand centre, meetings were arranged with the WSAs to discuss the WC/WDM strategy development methodology, as well as to discuss the findings extracted from the existing data sources. The main objective of these meetings was to establish:

- Status quo on the implementation of the WC/WDM strategy;
- Discussion of water balance and scorecard;
- Results from the various interventions;
- Problems and possible solutions for implementing a WC/WDM project; and
- Prioritising of key projects and development of a realistic implementation programme.

The quantitative base data collected included demographic data, tariff information as well as

figures pertaining to the number of industries and public institutions present in the LMs. The modified IWA Water Balance for South Africa was utilised to capture and calculate the water balances for the LMs as shown in **Figure 2.1**. The municipalities were requested to complete a quantitative score card which allowed the municipality to assess the areas of WC/WDM requiring a more concerted effort. In addition to the quantitative data component, a comprehensive qualitative questionnaire was developed for discussion purposes with the municipalities. The questionnaire was aimed at gathering detailed information from the municipalities under investigation pertaining to the adequacy of institutional aspects of the organisation to support demand management, the availability of materials, vehicles and other support structures to aid in the implementation of WC/WDM. It also assessed the efficacy of the metering and billing systems, levels of political support, customer relations and support services, asset management as well as the nature, level and frequency of the technical interventions undertaken to ensure proper management of the water systems and NRW reduction. This questionnaire formed the bulk of the status quo assessment visits, and the open ended nature of the questions allowed the respondents to provide comprehensive information related to the perceived functioning of the municipalities.

<table>
<tr><td rowspan="8">System Input Volume</td><td rowspan="3">Authorised Consumption</td><td rowspan="2">Billed Authorised Consumption</td><td>Billed Metered Consumption</td><td>Free basic Revenue Water</td></tr>
<tr><td>Billed Unmetered Consumption</td></tr>
<tr><td rowspan="2">Unbilled Authorised Consumption</td><td>Unbilled Metered Consumption</td><td rowspan="6">Non Revenue Water</td></tr>
<tr><td>Unbilled Unmetered Consumption</td></tr>
<tr><td rowspan="5">Water Losses</td><td rowspan="2">Apparent Losses</td><td>Unauthorised Consumption</td></tr>
<tr><td>Customer Meter Inaccuracies</td></tr>
<tr><td rowspan="3">Real Losses</td><td>Leakage on Transmission and Distribution Mains</td></tr>
<tr><td>Leakage and Overflows at Storage Tanks</td></tr>
<tr><td>Leakage on Service Connections up to point of Customer Meter</td></tr>
</table>

Figure 2.1: Modified IWA Water Balance

Through the discussion, the project team attempted to identify the “quick fix” projects whereby major savings can be achieved for limited capital investment.

2.3 TASK 3: STRATEGY AND BUSINESS PLAN DEVELOPMENT

Based on the results from Tasks 1 and 2, strategy and business plans were developed for each municipality. This strategy focuses on the following aspects:

- Reduction of water losses;
- More efficient use of existing water supplies;
- Deferred construction of new facilities;
- Increased revenues; and

- Decreased expenditure on purchasing or producing water, due to lower volumes of water required, reduced power costs, reduced chemical costs, etc.

The results from this task are included in a realistic WC/WDM strategy and business plan which assess the potential savings, the cost implications and programme for implementation. The strategy was forwarded to the respective WSAs for approval and implementation in each of the demand centres (refer to **Appendix A** for the full strategy documents).

2.4 TASK 4: REVIEW STRATEGIES AND BUSINESS PLANS

It is imperative that the targets set in the strategy are realistic and the goals are met as it has a direct implication on future augmentation schemes. The WC/WDM strategies will be reviewed after 18 months to assess whether the targets have been met.

Should it be found that the targets are unrealistic; the WC/WDM will be changed accordingly.

3 STATUS QUO ASSESSMENT

The Vhembe and Mopani District municipalities as well as Polokwane were the first institutions to be assessed as the Water Services Authorities within the study area. Although these municipalities were initially assessed under the Rapid Response Programme, the issues discussed with the municipalities during the interviews remained relevant for the Luvuvhu-Letaba assessment.

3.1 HISTORICAL WATER REQUIREMENTS

Historical water consumption figures were obtained from the WSDP and previous reports. There are huge discrepancies between the various sources of information as shown in **Figures 3.2 and 3.3**.

Table 3.1: Mopani DM Water Requirements

Municipality	Population		System Input Volume (Million m³)		l/c/d
	Source	Adopted	Source	Adopted	Adopted
Greater Giyani	LLRS	275 809	WISIP	18.85	187
Greater Letaba	LLRS	268 398	Lepelle	13.3	147
Greater Tzaneen	LLRS	392 426	Blue Drop/All Town	14.55	102
Ba-Phalaborwa*	WISIP	155 599	WISIP	23.66	417
Maruleng *	WISIP	108 449	All Town	4.40	112
Mopani DM Total		**1 200 681**		**74.80**	**164**

Source: Department of Water Affairs, Water Infrastructure Status & Intervention Plans (2012), All Town Study, Lepelle Northern Water Annual Report 2011, Luvhuvhu Letaba Reconciliation Strategy 2012, Blue Drop Report (2012)

Table 3.2: Vhembe DM Water Requirements

Municipality	Population		System Input Volume (Million m³)		l/c/d
	Source	Adopted	Source	Adopted	Adopted
Musina*	WISIP	51 892	Musina LM	4.96	262
Mutale	LLRS	94 639	Mutale LM	9.63	279
Thulamela	LLRS	616 711	WISIP	41.07	187
Makhado	LLRS	416 054	LLRS	19.60	129
Mopani DM Total		**1 179 296**		**75.25**	**140**

Source: Department of Water Affairs, Water Infrastructure Status & Intervention Plans – 2012

There are major discrepancies between the various information sources as depicted in **Table 3.1** and **Table 3.2** and engineering judgement combined with knowledge of the area was used to assess the current consumption. The estimated water consumption is further complicated by the intermittent supply problems experienced in the area.

The average consumption in Mopani DM is well in line with the national average of 236ℓ/c/d, but the results indicate that the supply is inequitable with scope for reduction in the urban areas. The average supply in Vhembe is considerably lower but also inequitable. The average consumption is also in line with the generally low level of service experienced in the area.

3.2 WATER BALANCE AND KPI

The existing information from the Ministerial NRW assessments and other sources were utilised and modified to include all the requirements of the Water Services Audit. The database was populated with the basic information required to run the IWA water balance model.

Where there was limited information available as shown in **Figure 3.1** and **Figure 3.2** below, estimates were calculated in order to complete the water audit for all nine municipalities within the WSAs that makes up Luvuvhu Letaba Water Management Area.

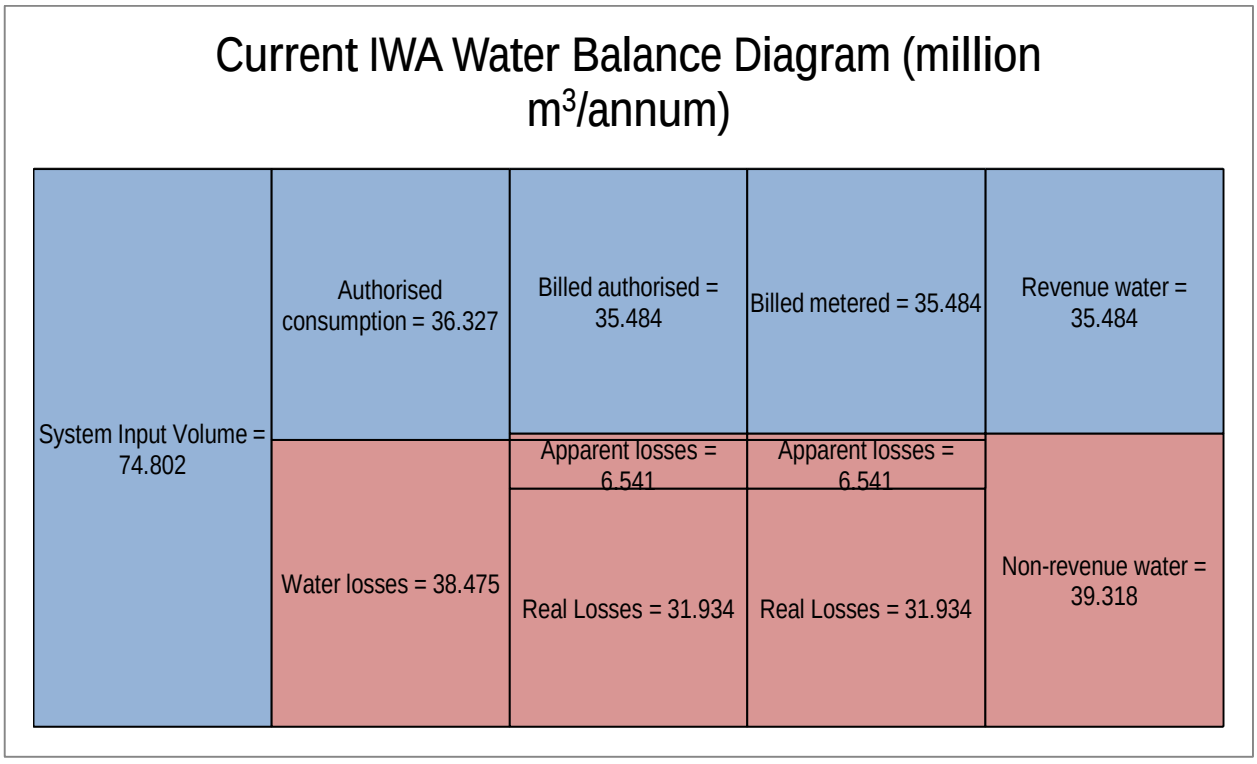

Figure 3.1: Mopani DM IWA Water Balance (million m^3/a)

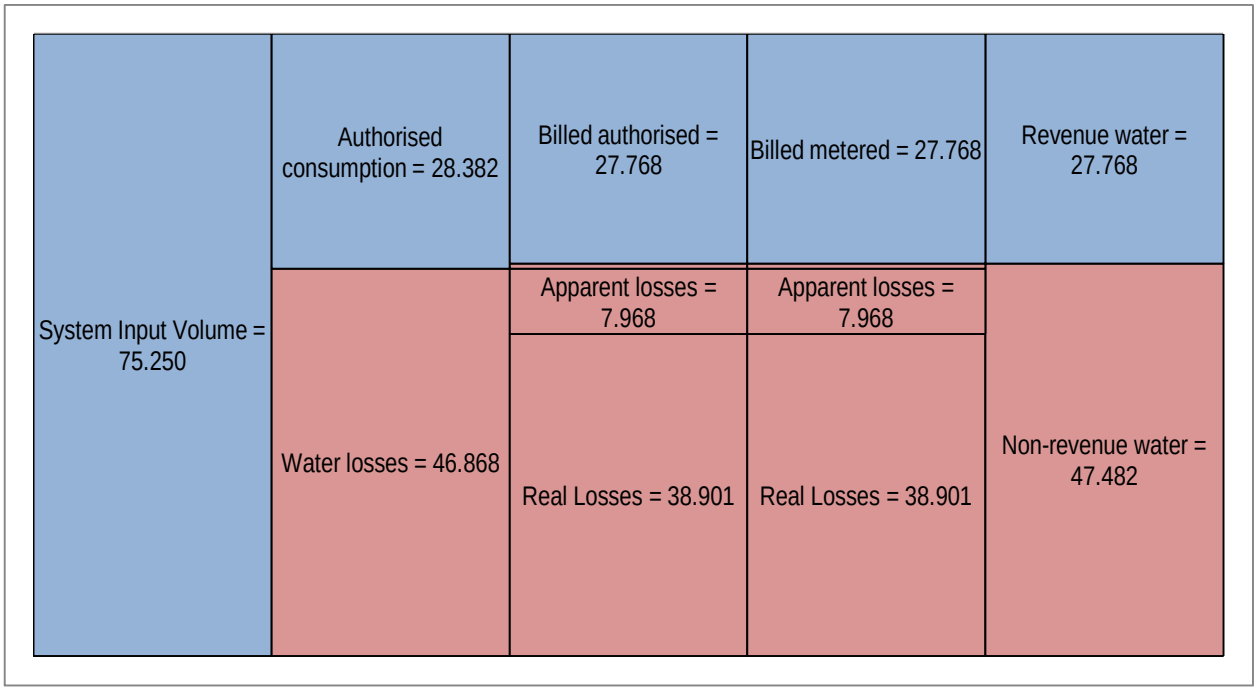

Figure 3.2: Vhembe DM Historical Data (million m^3/a)

Based on the results from **Figure 3.1** and **Figure 3.2**, it is apparent that non-revenue water challenges facing Vhembe and Mopani DM are similar in many respects to problems experienced by numerous other municipalities throughout South Africa. Payment for services is very low in the study area and the consumers that are able to pay for services can maintain their domestic water supply systems. In the rural and low-income areas, however, many consumers who cannot afford to pay for their water rely mostly on the free basic water allowances.

The standard IWA Non-Revenue Water Balance template was utilised to capture and calculate the water balances for each of the District Municipalities (WSAs). The results and key performance indicators are summarised in **Table 3.3** below.

Table 3.3: KPI's

Indicator	Vhembe DM	Mopani DM	Polokwane LM
Annual input volume (million m^3/a)	75.25	74.80	34.6
Daily input volume (Mℓ/d)	206	204	95
Population	1 179 296	1 200 681	631 318
Number of households	270 352	282 863	153 980
% Non-revenue water	<55%	<65%	45%
ℓ / capita / day	140	164	150
m^3 / household / month	19	21	19

Table 3.3 indicates that the average water consumption is within the acceptable range but non-revenue water is very high and it is expected that the demand is currently curbed by the poor supply in some areas. The results are based on estimates and the municipalities urgently need to address the poor management information.

In order to address water challenges in the study area, many WC/WDM interventions can be considered. Each municipality within the WMA has its own unique problems to some extent although the main underlying issues are often similar. Before deciding on how to address the problems, it is first necessary to understand them. To this end, an overview of all possible WC/WDM interventions is essential so that potential measures may be assessed. A full WC/WDM strategy would normally include a wide range of interventions tailored to the specific problems identified in each area. The interventions would then be prioritised in such a manner that the maximum savings can be achieved for the minimum expense and the implementation would be scheduled accordingly. The challenges and interventions are discussed below.

3.3 INSTITUTIONAL REVIEW

Based on the discussions, it became apparent that the WSAs were plagued by a magnitude of logistical and institutional factors which contribute to the varying state of water service delivery in the area. All the WSAs and WSPs are characterised by high vacancy rates, especially in their water services departments. There are also no clear service level agreements between the WSAs and WSPs and roles and responsibilities are not clearly defined.

Both the Vhembe and Mopani DM's are characterised by insufficient human capacity and skills to undertake all the technical work. Vhembe DM noted a particularly limited skills base in the WSA at both the management and operations and maintenance level. A primary matter of concern for the Mopani DM is the ageing skills base and the difficulty in training older staff. Mopani DM, however, has indicated that although the DM lacks the staff required for the work, the available human resources are correctly skilled.

Due to the budgetary and capacity constraints, no training on WC/WDM is taking place in any of the WSAs. Some training, however, has been provided in the Mopani DM for the process controllers. In recent years, the DWA has placed significant emphasis on improving the water quality in municipalities and funding has been provided for the proper training of municipal waste water treatment personnel. It is clear that the same level of commitment and drive is required to enforce and improve WC/WDM practices in municipalities.

Amongst the challenges common across the WSAs in the Limpopo region, is the availability of support structures to undertake the necessary system operations and maintenance work. Vhembe District attributed their challenge to lack of funding for the deficiencies, whilst Mopani DM pointed out that the primary challenge lies not with funding but rather inefficient expenditure of the available budget. Further contributing factors are the procurement processes which were mentioned to be slow and unresponsive. The problem of inadequate procurement processes was noted to be particularly prominent in Polokwane Municipality. Supply chain management however appears to be a pervasive challenge which must be addressed in order to improve the general state of infrastructure asset management.

At the WSA level, the relationship between the technical departments and the other departments (with specific reference to the department of finance) is positive with a reasonable flow of information between departments. Polokwane Municipality reported a very positive relationship between the departments and a working environment conducive to easy access to information. This, however, appears to not be the case at the WSP level.

All of the WSAs acknowledge the existence of political support for a variety of water related issues. They also stress, however, that training is urgently needed to improve the understanding of the water business and the municipal reforms that are required to improve cost recovery. All the WSAs are currently undergoing a bylaw review process. The Vhembe DM is developing water services bylaws which will be applied across all WSPs. It must be noted, however, that some of the WSPs have existing bylaws which were previously developed specific to the LMs which are being adopted. Further clarity is still required on how the new bylaws will be applied and whether stipulations will exist in terms of the blanket application of the bylaws at the WSP level. The WSAs have WSDP's in place which are updated on a continuous basis, but the accuracy of the data is very questionable and there is a serious lack of management information.

3.4 FINANCIAL REVIEW

The municipalities within the region are faced with significant infrastructure maintenance backlogs which have not been addressed due to budget limitations which, to a large extent, are caused by poor cost recovery. The same challenges face the WSAs under investigation with the exception of Polokwane which has reported improved levels of cost recovery due to concerted efforts to enforce the credit control policy. The primary source of funding for Vhembe and Mopani is grant funding, with Vhembe DM stating unequivocally that without the external grant funding, the municipal service would come to a standstill. This places the WSAs in positions of significant vulnerability.

A further critical matter in this regard is the tariff reforms which are required to promote WC/WDM. Whilst all WSAs have rising block tariffs in place, the existing tariffs do not account fully for the cost of water services. One of the challenges facing the WSAs is the high indigent and rural populations, which compounds the difficulties faced in both the cost recovery and tariff setting due to the limited urban regions which can be metered and billed for consumption versus the affordability for the consumers. It was noted, however, that a starting point for the municipalities would be to ensure that all the commercial properties and industries are metered and billed fully for consumption and monitored on a continuous basis, to ensure that the consumers that can pay, do pay for services. Proper arrangements are also required for new low cost housing developments with services installed, which should also be billed for consumption. These areas, when not managed closely, lead to significant water losses owing to poor quality fittings and general misuse of water resources. In addition, the tariff setting process should ideally include both the finance and technical departments to ensure that all aspects of water services are taken into account - with the aim to continuously improve the cost reflectiveness of the tariffs, and to support the future sustainability of the WSAs.

The state of billing and metering within the WSAs is a matter of great contention. The metering and billing task is undertaken by the WSPs, however, the administration of funds and the lines of communication and access to information in this regard are reflective of the poor overall relationship between the WSAs and the WSPs. The matter is further complicated by the fact that within the WSPs themselves, it is common for a lack of communication between the technical and finance departments; notwithstanding the reporting that must be completed for the WSAs. Vhembe DM has, however, undertaken cost recovery programmes implemented by an external service provider within the LMs; which aids in improving the accuracy of meter reading and billing, as well as the access to billing information. An observation was that the service providers report to

the WSA, but do not share the information collected with the WSP. This has resulted, in certain cases, with the service providers having more detailed information on the operations of the municipality than the municipal personnel, which does not bode well for skills development and the improvement of management information at the WSP level. In Polokwane Municipality, however, the simpler structure allows greater of access to information. The collection and collation of management information is, however, largely lacking.

3.5 SOCIAL REVIEW

Numerous studies conducted over the years have identified the need for proper public engagement and participation in improving service delivery in municipalities. It is unfortunate that the relationship between the WSA and the consumers within the Luvuvhu-Letaba WMA is strained due to general dissatisfaction with the state of water services. The WSAs openly acknowledge that, due to the prevailing shortages in water resources in the area; which should have to a large extent been rectified by the commissioning of the Nandoni Dam, parts of the region are on intermittent supply. This unhappiness with the quality of service has generated negative perceptions of the WSAs amongst consumers which, to some extent, has also contributed to the prevailing poor cost recovery. It must however be noted that at the WSP level, positive relationships do exist, with specific reference to municipalities such as Tzaneen and Musina Local Municipalities ,as well as Polokwane, where cost recovery and services have improved or have been maintained at an acceptable standard. Despite the multitude of challenges faced by the WSAs, no consumer engagement programmes are in place. Community awareness and education is habitually undertaken on an ad-hoc basis in cases of droughts or floods. This results in a consumer base that is ill-informed regarding water related issues and thus not cognisant of water conservation practices which would assist the WSAs in improving services in this region. Polokwane municipality has, however, made strides to implement community awareness. The programmes are not continuous, which has resulted in a consumer base which has not adequately internalised water conservation practices to alter behaviour. Likewise, the schools in the WMA are not regularly engaged on water matters and, as a significant identified avenue of water losses and thus of potential savings, a continuous education programme should ideally be implemented within this prime sector.

Currently, the WSAs have no structures in place to support consumers, with the exception of Polokwane Municipality which has a 24-hour customer care centre in place. There are no customer care centres available in the WSAs or WSPs to report leakage or submit water related queries. Such structures would be highly beneficial for the municipalities, particularly to aid passive leak detection and water loss monitoring through the communities. To address the magnitude of the challenges faced by the WSAs, the participation of both institutions and consumers or communities is crucial. Cost recovery and metering issues will not easily be addressed in the short-term. Consumer cooperation and support is therefore pertinent in this WMA.

3.6 TECHNICAL REVIEW

As mentioned previously, one of the primary challenges in the region is the availability and quality of basic water management information. The Mopani District has few bulk meters in place at which system input volumes can be measured, with the exception of the more well established WSPs, specifically Tzaneen Municipality. Likewise, the Vhembe District and Polokwane Municipality are faced with the same short comings. One of the reasons for the limitations in management information is the rural nature of most of the local municipalities, where a substantial component of the population utilises boreholes as the main source of water. The Vhembe District did, however, indicate that the water quality in a number of the main boreholes is monitored, as well as the yield thereof. It was also noted during the interview process that once the responsibility transfer process between the WSAs and WSPs has been concluded, bulk meters will be installed in the various local municipalities to improve the availability of the management information.

The installation of bulk meters is also planned for Polokwane Municipality in the near future. In line with the limitations in macro management information, the micro management structures in the form of sectorisation and zone metering are also largely absent, with the exception of Greater Tzaneen, Ba-Phalaborwa and Greater Letaba municipalities in the Mopani District. Basic, proactive infrastructure asset maintenance is also lacking in all the WSAs. There are significant infrastructure replacement backlogs in all instances, with no replacement programme in place to improve the situation. The water supply networks in the region are primarily asbestos cement, with significant pipe bursts in certain areas, particularly in the Mopani District, due to the age of the infrastructure. The water in the region is generally supplied at very low pressures, mainly because of the water shortages in the area, with very few instances of reservoir overflows also attributed to the limitations in the amount of the water resources available. There is thus limited scope existing for the implementation of pressure management in the region at this stage, with very few selected areas that would benefit from such interventions, such as Giyani and Tzaneen in Mopani District as mentioned by the WSA.

Numerous studies have noted the contribution of internal plumbing leakage as a significant component of water losses. The Vhembe District noted leakage on private properties as a significant problem in the WSA, which is not being addressed through the existing or current programmes. The Mopani District, contrarily, does not perceive experiencing a similar challenge however, this is not certain as no audits have been conducted in the WSA to establish the extent or occurrence of this problem. Whilst the general trend is that municipalities do not operate or repair leakage on private properties, huge benefit can be derived from undertaking such interventions; particularly in municipalities where cost recovery and payment for services is very poor as is the case with the aforementioned WSAs.

It is encouraging that despite the absence of an infrastructure replacement programme, some meter replacement programmes have taken place in the Vhembe District and the top consumers are monitored on a monthly basis. It is clear, however, from the discussions that despite the minimal population from which the costs of water services can be recovered, this is not undertaken to the fullest extent by both WSAs. Vhembe District indicates that approximately 60% of the non-domestic consumers in the WSA are billed and metered and 70% of the domestic consumers are metered and billed - which is surprising as the metering of the domestic consumers exceeds that of the non-domestic consumers from which a substantial portion of the costs can legitimately be

recovered. It is thus crucial that the non-domestic sector be investigated and audited in all WSAs to ensure that all industries and businesses are properly metered and billed to generate income for the municipalities.

A further significant challenge faced by the WSAs is that of illegal connections which have been noted to be widely prevalent in the rural segments of the region. This is mainly due to the community's dissatisfaction with the level of service provided in these areas. The high prevalence of illegal connections suggests that the apparent losses in these WSAs is significantly higher than the assumed estimates which are applied to water balance calculations in instances where the management information is lacking. As it has already been identified as a significant water loss contributor in this region, this component of the water losses warrants more detailed investigation.

The WSAs under investigation made mention of existing asset registers which include the bulk water infrastructure present. The asset registers, however, were noted to be primarily of a financial nature with limited detail on the life span and replacement details of the infrastructure. Mopani Districted noted the asset register for the WSA is currently under review in order to rectify, or compensate for, the existing limitations, whilst the outstanding infrastructure, which belonged to the Department of Water Affairs, will be captured in the asset register for Vhembe once the transfer of responsibilities between the WSAs and the WSPs have been completed.

Having expounded on the status quo of the WSAs in the region, it must be noted that the challenges at the local municipality level are largely similar across the board. The most outstanding trends observed throughout the local municipalities, or WSPs, are the glaring lack of management information (through deficient monitoring, recording and reporting and measurement structures). Furthermore, the dissension between the WSPs and the responsible WSAs causes substantial barriers in the access to management information, as well as to how this information is communicated, coordinated and understood. Generally, proactive asset management and maintenance appears largely absent which has significantly compromised the quality of water service provision in the WMA, with the bulk infrastructure in substantial disrepair. As mentioned previously, there is limited bulk and zone metering which allows for very limited macro and micro management of the water resources.

3.7 REGULATORY PERFORMANCE MEASUREMENT SYSTEM

The Department of Water Affairs measures and monitors the overall performance of water services authorities through the Regulatory Performance Measurement System (RPMS). The RPMS is a tool to assist the DWA consistently, transparently, and objectively measure performance in the sector.

KPIs 7 to 11 have a direct impact on WC/WDM and therefore analysed as part of this study. KPI 8 – Institutional Effectiveness and KPI 9 – Financial Performance are critical to implement effective WC/WDM and must be addressed as a matter of priority. KPI 11 highlights the lack of information with regards to management information. The results from the 2011/12 RPMS are summarised in **Table 3.4** and **Table 3.5**.

Table 3.4 Mopani DM RPMS Results

Key Performance Indicators	Achieved KPI Score	Required score	Performance assessment
KPI 1: Access to water supply	3.165	3	Adequate
KPI 2: Access to sanitation	3.125	3	Adequate
KPI 3: Access to Free Basic Water	2.689	3	Concern
KPI 4: Access to Free Basic Sanitation	0	3	Crisis
KPI 5: Drinking Water Quality management	0	3	Crisis
KPI 6: Wastewater quality management	2	3	Concern
KPI 7: Customer service quality	1.75	3	Concern
KPI 8: Institutional effectiveness	3.343	3.5	Concern
KPI 9: Financial performance	2.929	4	Concern
KPI 10: Strategic asset management	4.534	3	Excellent
KPI 11: Water use efficiency	No data	3	No data

Table 3.5 Vhembe DM RPMS Results

Key Performance Indicators	Achieved KPI Score	Required score	Performance assessment
KPI 1: Access to water supply	1.87	3	Concern
KPI 2: Access to sanitation	3.113	3	Adequate
KPI 3: Access to Free Basic Water	5	3	Excellent
KPI 4: Access to Free Basic Sanitation	0	3	Crisis
KPI 5: Drinking Water Quality management	1	3	Crisis
KPI 6: Wastewater quality management	0	3	Crisis
KPI 7: Customer service quality	3.5	3	Good
KPI 8: Institutional effectiveness	3.276	3.5	Concern
KPI 9: Financial performance	0.571	4	Crisis
KPI 10: Strategic asset management	3.375	3	Good
KPI 11: Water use efficiency	0	3	Crisis

The results from the RPMS confirms the problems the municipality is facing in terms of institutional, customer care, finances, asset management and water loss management.

3.8 BLUE DROP ASSESSMENTS

Ensuring efficient and continuous supply to an area is a prerequisite for implementing effective WC/WDM. WC/WDM cannot be promoted and implemented in areas characterised by intermittent supply and poor level of service.

The Blue Drop assessment process is an effort by the Department to raise the drinking water quality and reliability of supply to all consumers. The incentive-based regulatory approach acts as a positive stimulus to facilitate improved performance and public accountability, whilst establishing essential systems and processes to sustain and measure gradual improvement. The results from

the Blue Drop assessment is an indication of the efficiency and sustainable supply to an area which impacts directly on WC/WDM.

The regulatory impression of Mopani DM is quoted as follows *"The DWA Inspectors identified lack of municipal management support as a reason of concern which could delay future improvements in the drinking water quality management performance of the Mopani District Municipality. While the municipality provided information that allowed a better assessment of performance in most of the supply systems managed solely by Mopani, a number of systems were still found not-assessed. Water to residents in the Nondweni, Nkambako, Thapane Semarela, Giyani, Mapuve and Middle Letaba water supply areas were found of a microbiological quality not compliant with the requirements of SANS 241 (South African National Standard for Drinking Water). The performance of Mopani was measured at higher scores in systems where the WSA received assistance from Tzaneen Local Municipality and Northern Lepelle Water"*.

The regulatory impression of Vhembe DM is quoted as follows *"The 2012 Blue Drop scores for Vhembe District Municipality indicates the significant achievement of improvement in performance for every water supply system within the water services authority's area of jurisdiction. This momentous accomplishment warrants celebration of the dedication of those responsible for drinking water quality operations and management within this municipality"*.

3.9 WCWDM QUANTITATIVE SCORECARD

The WC/WDM quantitative scorecard provides an indication of the WC/WDM activities the municipalities are undertaking against international best practice. The purpose of the scorecard is for municipalities to evaluate themselves on an annual basis and attempt to improve their score.

The results for Mopani and Vhembe are shown in **Figure 3.3** and **Figure 3.4** respectively.

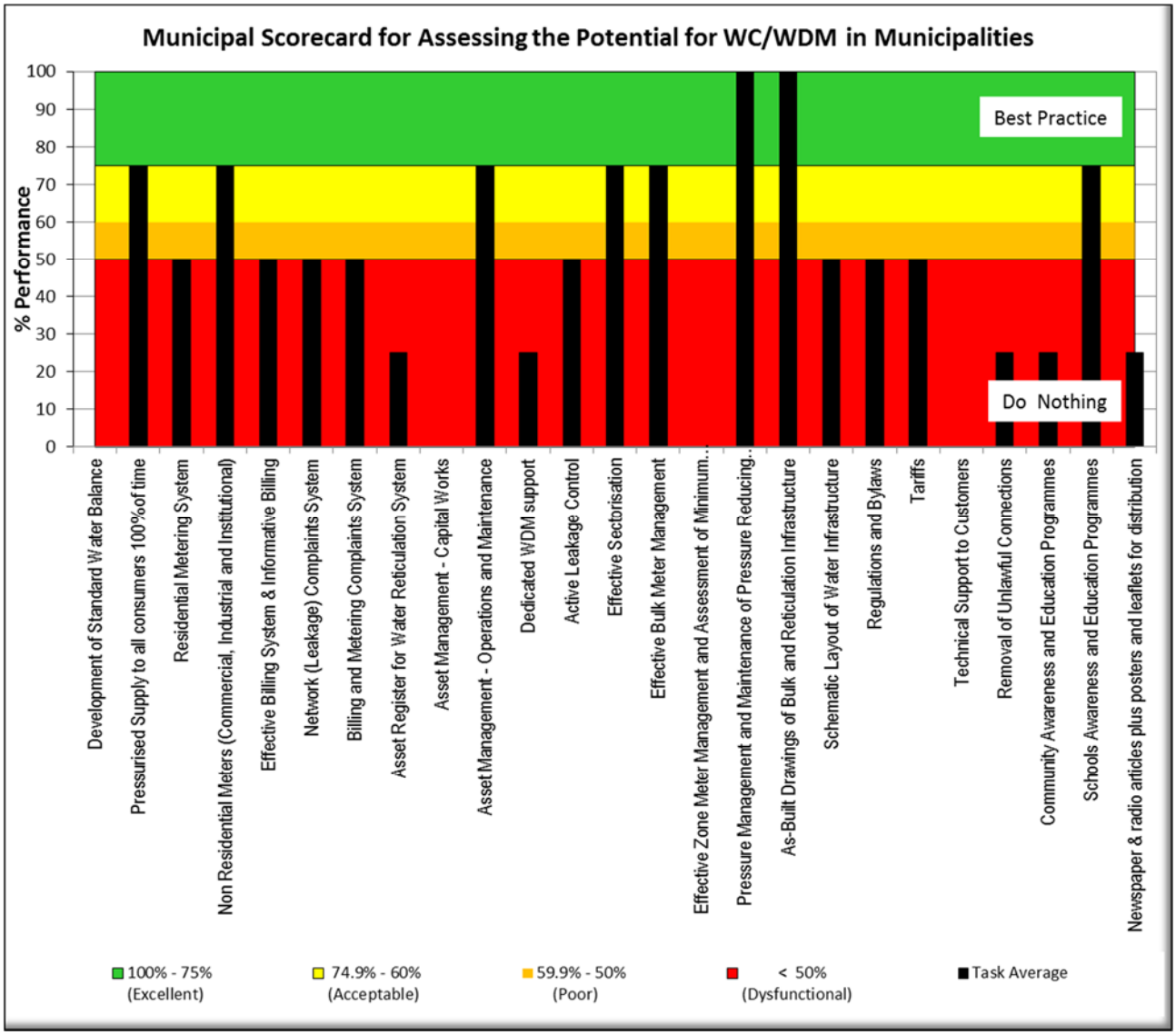

Figure 3.3 Mopani Quantitative Scorecard

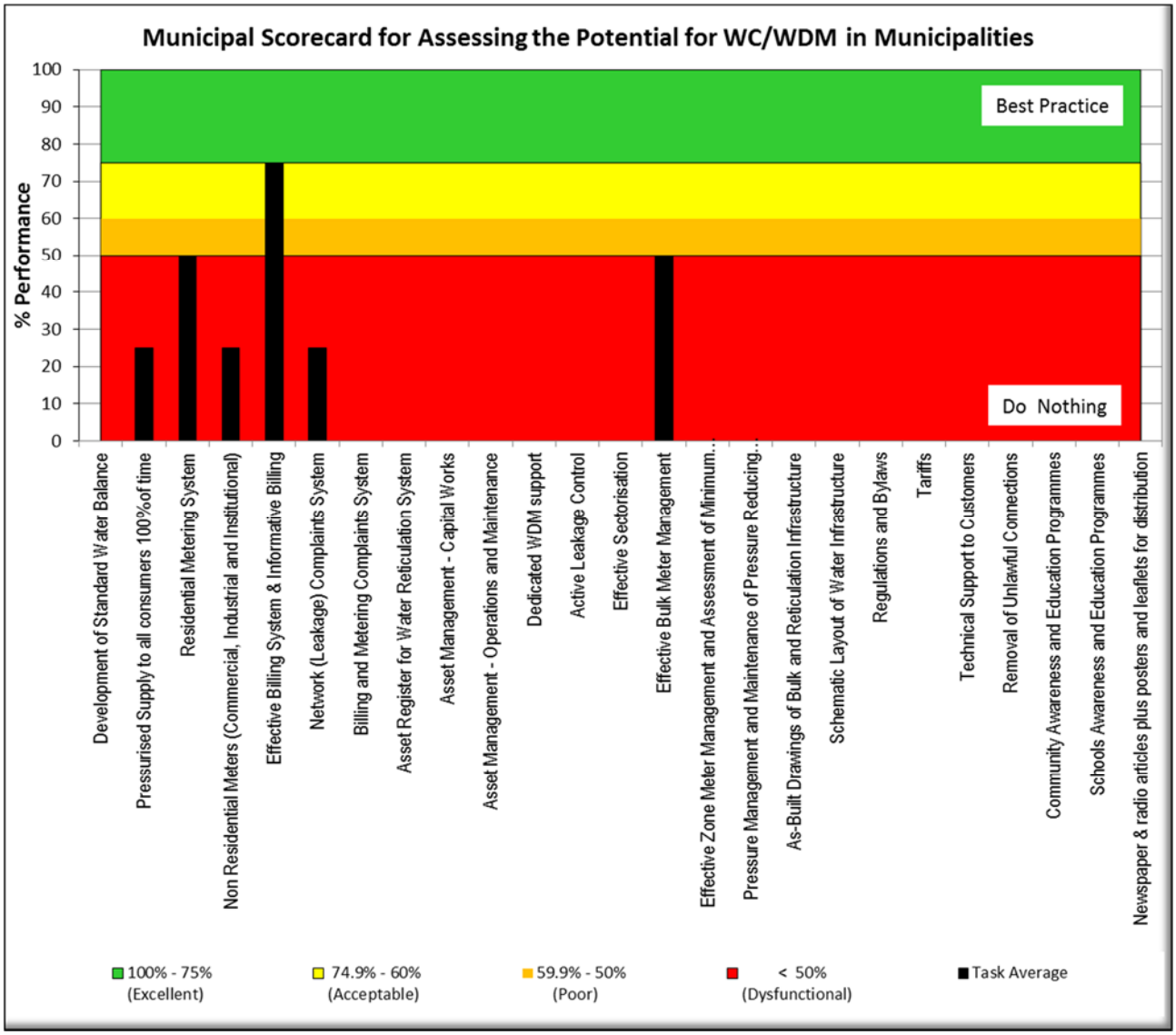

Figure 3.4 Vhembe Quantitative Scorecard

The results from the quantitative scorecard confirms that WC/WDM is not sufficiently addressed by the municipalities and performing these basic tasks will make a significant improvement.

3.10 FINANCIAL STATEMENT ASSESSMENT

Key results from the 2011/12 financial statement for Mopani DM and Vhembe DM are summarised in **Table 3.6** and **Table 3.7** respectively**.**

The results from both municipalities indicate the huge challenges faced by the municipalities with regards to cost recovery which will enable asset management, filling of vacancies and water loss management.

Table 3.6: Mopani DM Summary of Financial Statement

Revenue / Expenditure	2011 / 2012	2010 / 2011
Income from water sales	R 136 210 424	R 123 104 771
Bulk water purchases	R 96 758 375	R 72 545 334
Estimated volume water sold	35 483 518	
Estimated average R/kl sold	R 3.84	
Debtors	**2011 / 2012**	**2010 / 2011**
Current (0 -30 days)	R 12 954 594	R 3 062 512
31 - 60 days	R 13 019 031	R 2 081 367
61 - 90 days	R 8 233 129	R 1 864 156
91 - 120 days	R 6 246 847	R 112 887 977
121 - 365 days	R 53 969 176	R 126 233 537
> 365 days	R 141 388 960	-
Total	**R 235 811 737**	**R 246 129 549**
Financial performance of water segment	**2011 / 2012**	**2010 / 2011**
Actual Income	R 0	R 0
Actual Expenditure	R 420 294 677	R 232 857 818
Surplus / (Deficit)	(420 294 677)	(232 857 818)
Asset value (excluding depreciation)	**2011 / 2012**	**2010 / 2011**
Water reservoirs & reticulation	R 1 853 915 127	R 1 742 182 523

The status of water supply services is described as follows in the financial statements:

"Water still remains a challenge within the district given the ageing infrastructure, huge number of illegal connections and new unplanned residential sites particularly in the rural communities".

"The position of Director Water Services was filled in July 2012 while the position of Director Corporate Services became vacant as from August 2012. The total approved posts is 1 564 which includes the staff transferred from the Department of Water Affairs. Only 886 posts have been filled with 730 vacant which also include retirements within the water directorate and the municipality is currently working around the clock to fill all the budgeted positions".

Table 3.7: Vhembe DM Summary of Financial Statement

Revenue / Expenditure	2011 / 2012	2010 / 2011
Musina	21 445 350	23 493 508
Thulamela	26 513 595	25 517 503
Makhado	21 051 139	18 454 400
Mutale	3 421 362	3 072 646
Total water sales	72 431 446	70 538 059
Debtors	**2011 / 2012**	**2010 / 2011**
Thulamela	73 332 292	74 586 847
Makhado	23 643 590	26 353 635
Musina	63 835 491	66 023 362
Mutale	12 462 989	6 854 255

Total	**173 274 362**	**173 818 099**
Current (0 -30 days)	5 454 836	5 551 529
31 - 60 days	6 072 253	4 181 856
61 - 90 days	6 105 046	4 183 574
91 - 120 days	4 410 817	4 036 280
121 - 365 days	150 620 397	158 420 695
Provision	(109 296 663)	(130 410 379)
Total	63 366 686	45 963 555
Financial performance of water segment	**2011 / 2012**	**2010 / 2011**
Actual Income	932 036 790	794 322 640
Actual Expenditure	644 249 378	734 966 101
Surplus / (Deficit)	287 787 412	59 356 539
Asset value (excluding depreciation)	**2011 / 2012**	**2010 / 2011**
Water reservoirs & reticulation	1 354 284 328	1 700 826 990

The status of water supply services is described as follows in the financial statements:

"Service charges relating to water are based on consumption. Meters are read on a quarterly basis and are recognised as revenue when invoiced. Provisional estimates of consumption are made monthly when meter readings have not been performed. The provisional estimates of consumption are recognised as revenue when invoiced. Adjustments to provisional estimates of consumption are made in the invoicing period in which meters have been read. These adjustments are recognised as revenue in the invoicing period. Revenue from the sale of water prepaid meter cards is recognised at the point of sale".

"During the current financial year the municipality incurred average distribution losses of 18 071 278 m^3 due to the water leakages".

4 STRATEGIES

4.1 INSTITUTIONAL STRATEGY

From an institutional standpoint, the key intervention in the WSAs within the Luvuvhu-Letaba WMA will be to address the considerable vacancies or shortages in human resources and skills. Ideally, dedicated individuals or sections should be established in order to drive Water Conservation and Demand Management. 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 is 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. In this regard, an NRW steering committee comprising of the relevant councillors, finance representatives, communication and the technical department may be established to facilitate improved reporting and management of NRW. Procurement processes during and after the transition period must also be streamlined in order to enable swifter access to support structures required for operations and maintenance tasks, which are necessary to mitigate water losses in the systems. Political support cannot be divorced from any of the abovementioned strategic matters, as it is essential for the acceptance, adoption and implementation of all the key NRW reduction initiatives.

4.2 SOCIAL STRATEGY

One of the key findings of the assessments undertaken was the pervasive poor relationships existing between the WSAs and the consumers. The assessment also revealed that very little was being done to engage the consumers on water issues and to gain their cooperation whilst the WSAs tackle the pertinent water challenges within the WMA. As mentioned previously, the consumer behaviour and adaptation to increasing water scarcity is crucial, not only in water loss reduction initiatives, but also the mitigation of further scarcity in the WMA. 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. The installation of water efficient devices, as well as rain water harvesting; are also avenues which can further be explored for promotion and implementation in different sectors. These water efficient devices may also aid water loss reduction at the consumer level, particularly in areas where metering and billing cannot immediately be effected, and where cost recovery is very low due to high indigent populations. Structures should be put in place to support consumers in reporting leakage and other service related complaints. This information should be captured electronically in order to allow proper tracking and analysis of water loss contributors and significant problem areas. The political leadership should lead these interventions and provide substantial support in order to improve the sustainability of the community based interventions.

4.3 FINANCIAL STRATEGY

It is widely accepted that one of the key reforms required in the municipal sector is financial reform. Such reform includes the overhaul of metering and billing systems to improve the state of internal

revenue, as well as tariff setting process and outcomes that not only promote water loss and demand reduction in line with the presidential targets; but also take into account the cost of water services. One of the findings of the financial review conducted, particularly in the Vhembe DM, was the lack of a proper methodology in the tariff setting process. In the absence of the application of guidelines to the process, the tariffs do not promote demand management or reflect the cost of water services. This ideal is not easy to achieve in light of the indigent levels in the municipalities under investigation. Where practicable, however, metering and billing must be effected, particularly in the non-domestic sector. As a first step, meter audits should be undertaken in this consumer sector 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 includes inputs from the technical departments which could assist in making the tariffs increasingly effective in achieving the water use efficiency objectives.

National Treasury has been very vocal on the dependency of municipalities on grant funding and has emphatically expressed the need for municipalities to actively demonstrate a commitment to proper budgeting, planning and cost recovery, with a focus on demand side management as a first step in managing and more effectively utilising the available resources. The aforementioned require closer monitoring of consumers, particularly the top consumers, an effective system to capture and refer billing related complaints and progressive payment of services in the municipalities, which must be supported and preceded by proper community awareness and education, and wide spread public engagement.

4.4 TECHNICAL STRATEGY

The assessment conducted revealed two primary issues of water scarcity in the WMA. The first is the challenge of the water resource itself which must be rectified through additional resources. The second, however, relates to scarcity from the perspective of access to water resources which must be addressed at the WSA level. One of the primary challenges, as mentioned previously, is the availability of management information which must be rectified as a matter of priority. Measurement of the system input volumes as a first step is required to evaluate the extent of water losses in the WMA, particularly in the Mopani District, Vhembe District and Polokwane municipalities. Sectorisation and zone metering and monitoring is 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. It is an observed trend that in municipalities where management information structures are in place, the data obtained from the devices is not utilised. The data is neither captured or analysed in any meaningful way which would aid in generating the required management reports with the NRW KPI's included. The installation of meters is thus only the first step and will be altogether useless if the information is not captured and monitored on a monthly basis.

Proper budgets must also be set aside for proactive infrastructure asset maintenance. There is a substantial maintenance backlog in the municipalities in the WMA, with a significant number of access challenges being caused merely by the age of the existing infrastructure. Simply replacing the network will, however, not resolve all the challenges which will require greater community participation and cooperation to achieve. Passive leak detection through community reporting will greatly enhance the ability of the WSPs to monitor the network and explore potential for pressure

management in selected areas experiencing high pipe burst frequencies. The location of infrastructure also needs to be clarified in order to identify aspects of the network which are in a state that compromises the ability to provide services to the consumers. In this regard, there is a need to develop digital as-built drawings of the network which must be accompanied by the development of a comprehensive asset register. This register must incorporate critical information such as the age of the infrastructure, replacement period and cost, as well as the location of the assets. Through such interventions, substantial community based employment can be created, where indigent residents may be appointed and utilised to clean and locate the infrastructure.

5 WC/WDM PROJECTIONS

5.1 WATER SUPPLY AND DEMAND BALANCE DIAGRAM FOR VHEMBE DM

The potential impact of WCWDM on the future water requirements of Vhembe DM and its target water balance are shown in **Figure 5.1** and **Figure 5.2.**

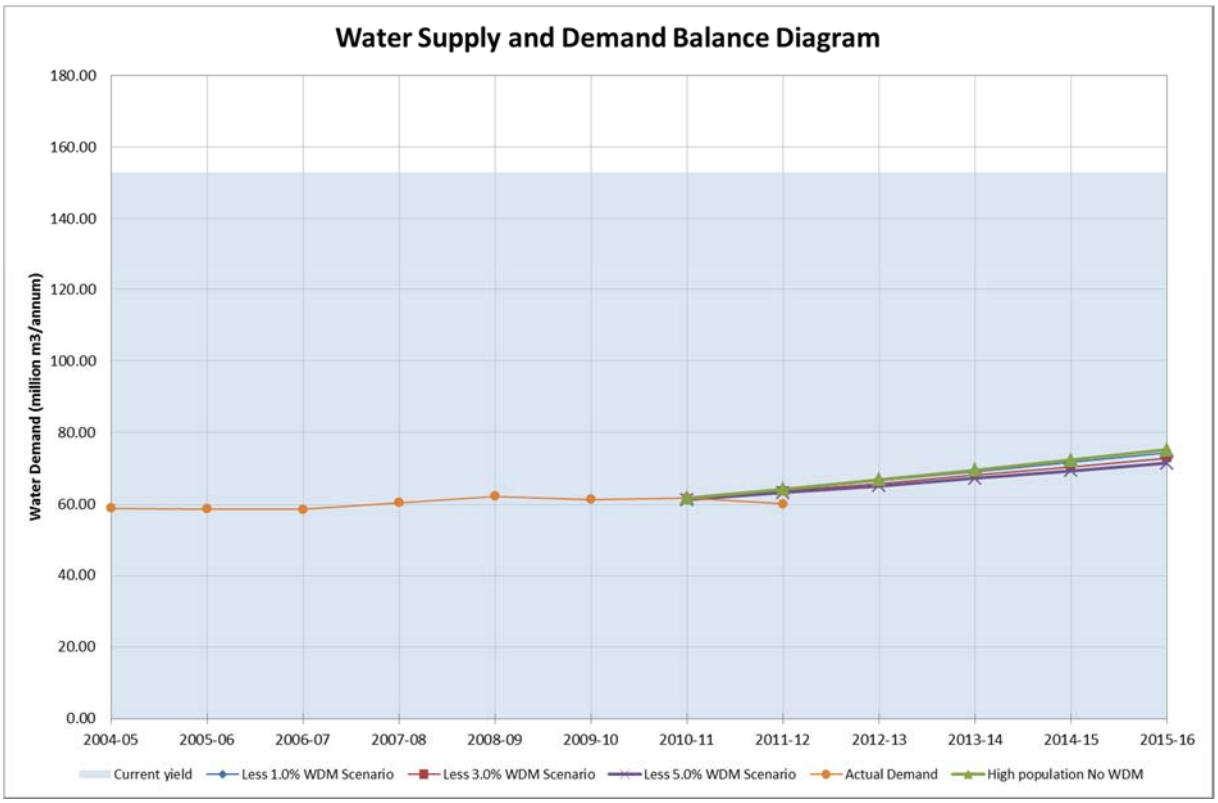

Figure 5.1: Vhembe DM Projections

From the graph it can be seen that overall Vhembe DM will probably not experience any deficit in the next five years but the supply is unequal and some areas already experiences deficits. Water demand management interventions must therefore be implemented as a matter of priority.

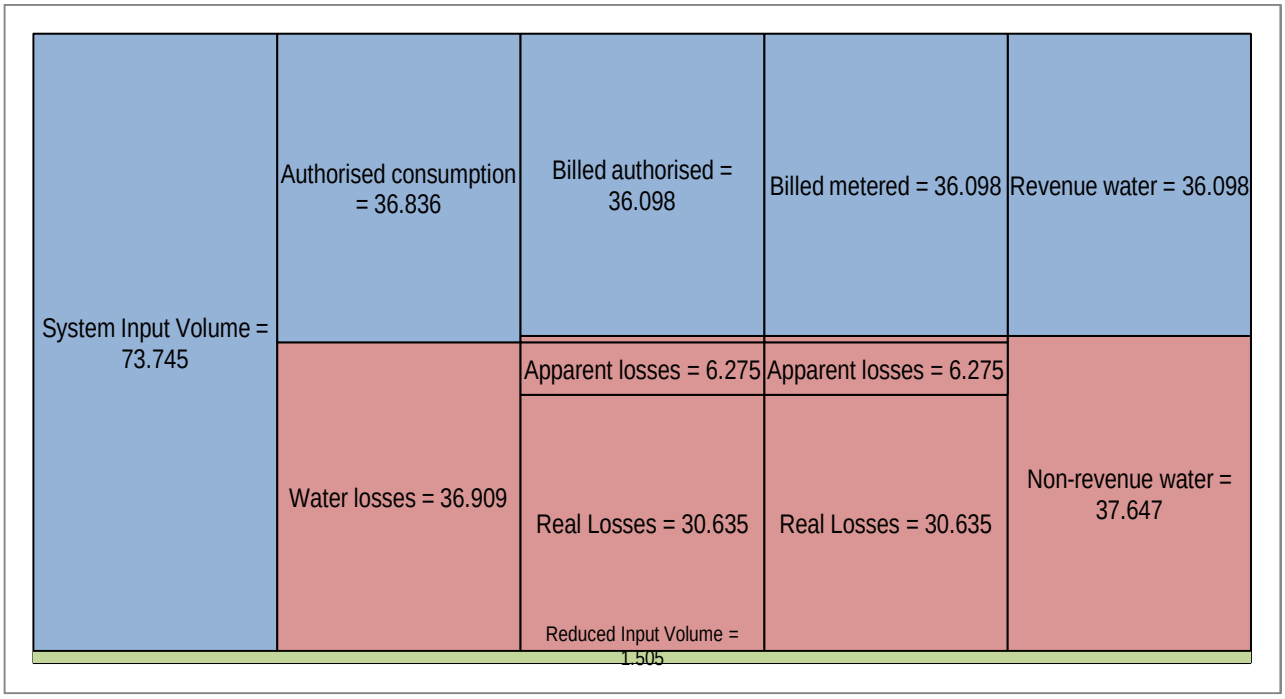

Figure 5.2: Vhembe DM Target Water Balance Diagram (million m^3/a)

5.2 WATER SUPPLY AND DEMAND BALANCE DIAGRAM FOR MOPANI DM

The potential impact of WCWDM on the future water requirements of Mopani DM and its target water balance are shown in **Figure 5.3** and **Figure 5.4.**

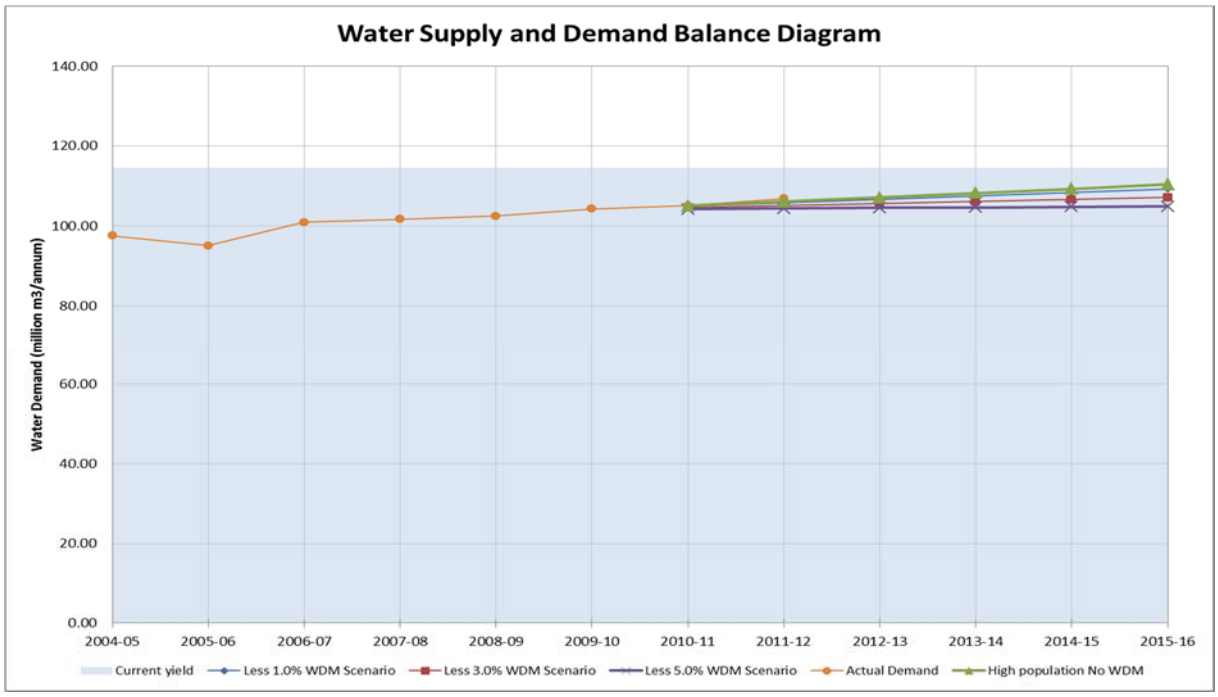

Figure 5.3: Mopani DM Projections

From the graph it can therefore be seen that Mopani DM will most experience water deficits in the near future and WC/WDM must be implemented.

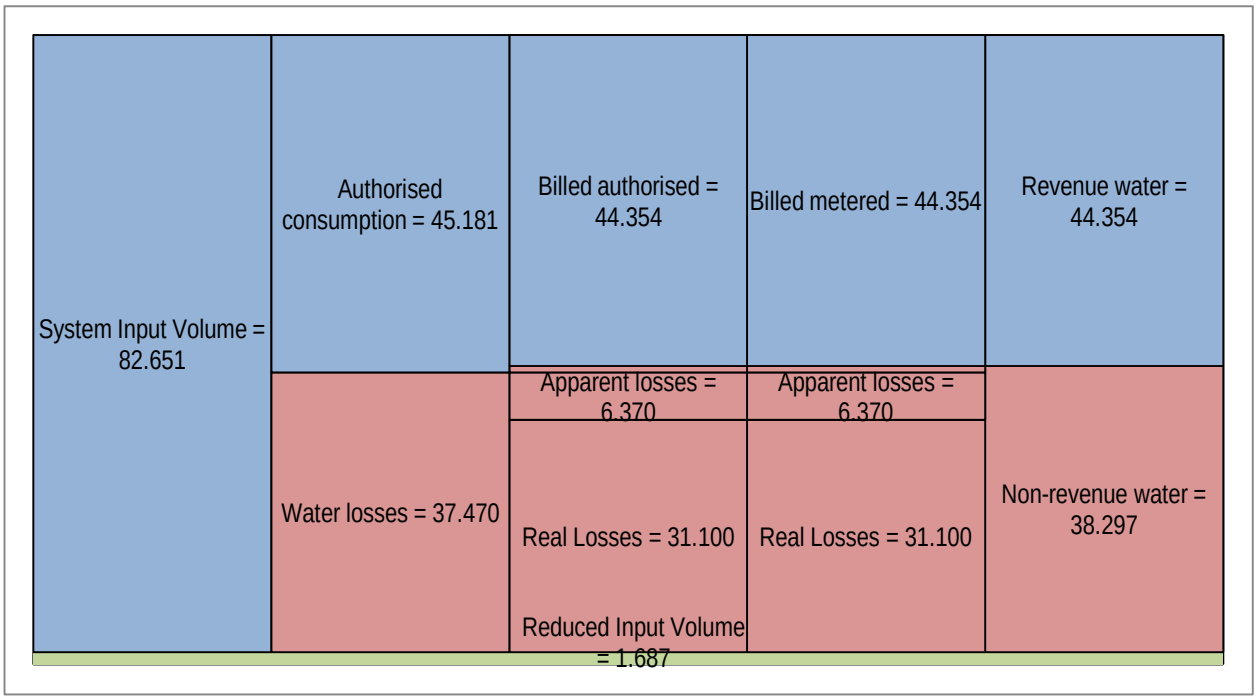

Figure 5.4: Mopani DM target water balance diagram (million m^3/a)

6 BUDGETS REQUIREMENTS

The budget requirements for the next five years are summarised in Table 6.1, Table 6.2and Table 6.3 The budget estimates address social, institutional, legal, financial and technical aspects of a WCWDM strategy. It also allows for capital, operation and maintenance budgets as most WC/WDM interventions fail after a few years when they are not maintained.

Table 6.1 Mopani Summary of Budget

	Type	Year 1	Year 2	Year 3	Year 4	Year 5	Total
TOTAL COSTS							
Institutional	CAPEX	R 1 000 000	R 500 000	R 500 000	R 0	R 0	R 2 000 000
	OPEX	R 575 000	R 575 000	R 575 000	R 575 000	R 575 000	R 2 875 000
	TOTAL	R 1 575 000	R 1 075 000	R 1 075 000	R 575 000	R 575 000	R 4 875 000
Financial	CAPEX	R 200 000	R 100 000	R 100 000	R 0	R 0	R 400 000
	OPEX	R 43 780 000	R 43 780 000	R 43 780 000	R 43 780 000	R 43 780 000	R 218 900 000
	TOTAL	R 43 980 000	R 43 880 000	R 43 880 000	R 43 780 000	R 43 780 000	R 219 300 000
Social	CAPEX	R 7 864 000	R 7 864 000	R 7 364 000	R 7 364 000	R 7 364 000	R 37 820 000
	OPEX	R 13 734 000	R 13 734 000	R 13 734 000	R 13 734 000	R 13 734 000	R 68 670 000
	TOTAL	R 21 598 000	R 21 598 000	R 21 098 000	R 21 098 000	R 21 098 000	R 106 490 000
Technical	CAPEX	R 53 333 700	R 52 748 700	R 47 486 200	R 46 971 200	R 46 971 200	R 247 511 000
	OPEX	R 30 512 600	R 30 512 600	R 30 512 600	R 30 512 600	R 30 512 600	R 152 563 000
	TOTAL	R 83 846 300	R 83 261 300	R 77 998 800	R 77 483 800	R 77 483 800	R 400 074 000
Total	CAPEX	R 62 397 700	R 61 212 700	R 55 450 200	R 54 335 200	R 54 335 200	R 287 731 000
	OPEX	R 88 601 600	R 88 601 600	R 88 601 600	R 88 601 600	R 88 601 600	R 443 008 000
	TOTAL	R 150 999 300	R 149 814 300	R 144 051 800	R 142 936 800	R 142 936 800	R 730 739 000
		R 150 999 300	R 149 814 300	R 144 051 800	R 142 936 800	R 142 936 800	
BENEFITS							
	Unit	Year 1	Year 2	Year 3	Year 4	Year 5	Total
CHANGE IN CONSUMPTION							
Reduced input volume		20%	40%	60%	80%	100%	300%
Volume	m^3/annum	436 400	872 800	1 309 200	1 745 600	2 182 000	6 546 000
Amount	R / annum	R 1 309 200	R 2 618 400	R 3 927 600	R 5 236 800	R 6 546 000	R 19 638 000
Increased revenue water		20%	40%	60%	80%	100%	300%
Volume	m^3/annum	1 774 200	3 548 400	5 322 600	7 096 800	8 871 000	26 613 000
Amount	R / annum	R 7 096 800	R 14 193 600	R 21 290 400	R 28 387 200	R 35 484 000	R 106 452 000
Total	R / annum	R 8 406 000	R 16 812 000	R 25 218 000	R 33 624 000	R 42 030 000	R 126 090 000
						Payback period - years	5.8

The payback periods for the projects are rather long but in the long term it is expected to reduce water losses and make the municipalities more sustainable.

Table 6.2 Vhembe Summary of Budget Requirements

	Type	Year 1	Year 2	Year 3	Year 4	Year 5	Total
TOTAL COSTS							
Institutional	CAPEX	R 400 000	R 600 000	R 0	R 0	R 0	R 1 000 000
	OPEX	R 600 000	R 600 000	R 600 000	R 600 000	R 600 000	R 3 000 000
	TOTAL	R 1 000 000	R 1 200 000	R 600 000	R 600 000	R 600 000	R 4 000 000
Financial	CAPEX	R 800 000	R 800 000	R 0	R 0	R 0	R 1 600 000
	OPEX	R 38 195 080	R 38 195 080	R 38 195 080	R 38 195 080	R 38 195 080	R 190 975 400
	TOTAL	R 38 995 080	R 38 995 080	R 38 195 080	R 38 195 080	R 38 195 080	R 192 575 400
Social	CAPEX	R 14 236 736	R 14 236 736	R 4 166 736	R 4 166 736	R 4 166 736	R 40 973 680
	OPEX	R 12 750 840	R 12 750 840	R 12 750 840	R 12 750 840	R 12 750 840	R 63 754 200
	TOTAL	R 26 987 576	R 26 987 576	R 16 917 576	R 16 917 576	R 16 917 576	R 104 727 880
Technical	CAPEX	R 41 913 680	R 48 183 600	R 27 403 600	R 26 778 600	R 26 778 600	R 171 058 080
	OPEX	R 21 874 390	R 21 874 390	R 21 874 390	R 21 874 390	R 21 874 390	R 109 371 950
	TOTAL	R 63 788 070	R 70 057 990	R 49 277 990	R 48 652 990	R 48 652 990	R 280 430 030
Total	CAPEX	R 57 350 416	R 63 820 336	R 31 570 336	R 30 945 336	R 30 945 336	R 214 631 760
	OPEX	R 73 420 310	R 73 420 310	R 73 420 310	R 73 420 310	R 73 420 310	R 367 101 550
	TOTAL	R 130 770 726	R 137 240 646	R 104 990 646	R 104 365 646	R 104 365 646	R 581 733 310
		R 130 770 726	R 137 240 646	R 104 990 646	R 104 365 646	R 104 365 646	
BENEFITS							
	Unit	Year 1	Year 2	Year 3	Year 4	Year 5	Total
CHANGE IN CONSUMPTION							
Reduced input volume		20%	40%	60%	80%	100%	300%
Volume	m^3/annum	245 600	491 200	736 800	982 400	1 228 000	3 684 000
Amount	R / annum	R 491 200	R 982 400	R 1 473 600	R 1 964 800	R 2 456 000	R 7 368 000
Increased revenue water		20%	40%	60%	80%	100%	300%
Volume	m^3/annum	1 110 800	2 221 600	3 332 400	4 443 200	5 554 000	16 662 000
Amount	R / annum	R 4 443 200	R 8 886 400	R 13 329 600	R 17 772 800	R 22 216 000	R 66 648 000
Total	R / annum	R 4 934 400	R 9 868 800	R 14 803 200	R 19 737 600	R 24 672 000	R 74 016 000
						Payback period - years	7.9

Table 6.3 Polokwane Summary of Budget Requirements

	Type	Year 1	Year 2	Year 3	Year 4	Year 5	Total
TOTAL COSTS							
Institutional	CAPEX	R 100 000	R 300 000	R 0	R 0	R 0	R 400 000
	OPEX	R 600 000	R 600 000	R 600 000	R 600 000	R 600 000	R 3 000 000
	TOTAL	R 700 000	R 900 000	R 600 000	R 600 000	R 600 000	R 3 400 000
Financial	CAPEX	R 100 000	R 300 000	R 0	R 0	R 0	R 400 000
	OPEX	R 9 000 000	R 9 000 000	R 9 000 000	R 9 000 000	R 9 000 000	R 45 000 000
	TOTAL	R 9 100 000	R 9 300 000	R 9 000 000	R 9 000 000	R 9 000 000	R 45 400 000
Social	CAPEX	R 750 000	R 750 000	R 250 000	R 250 000	R 250 000	R 2 250 000
	OPEX	R 1 440 000	R 1 440 000	R 1 440 000	R 1 440 000	R 1 440 000	R 7 200 000
	TOTAL	R 2 190 000	R 2 190 000	R 1 690 000	R 1 690 000	R 1 690 000	R 9 450 000
Technical	CAPEX	R 10 861 000	R 13 736 000	R 6 539 000	R 6 314 000	R 6 314 000	R 43 764 000
	OPEX	R 4 952 800	R 4 952 800	R 4 952 800	R 4 952 800	R 4 952 800	R 24 764 000
	TOTAL	R 15 813 800	R 18 688 800	R 11 491 800	R 11 266 800	R 11 266 800	R 68 528 000
Total	CAPEX	R 11 811 000	R 15 086 000	R 6 789 000	R 6 564 000	R 6 564 000	R 46 814 000
	OPEX	R 15 992 800	R 15 992 800	R 15 992 800	R 15 992 800	R 15 992 800	R 79 964 000
	TOTAL	R 27 803 800	R 31 078 800	R 22 781 800	R 22 556 800	R 22 556 800	R 126 778 000
		R 27 803 800	R 31 078 800	R 22 781 800	R 22 556 800	R 22 556 800	
BENEFITS							
	Unit	Year 1	Year 2	Year 3	Year 4	Year 5	Total
CHANGE IN CONSUMPTION							
Reduced input volume		20%	40%	60%	80%	100%	300%
Volume	m^3/annum	711 800	1 423 600	2 135 400	2 847 200	3 559 000	10 677 000
Amount	R / annum	R 3 658 652	R 7 317 304	R 10 975 956	R 14 634 608	R 18 293 260	R 54 879 780
Increased revenue water		20%	40%	60%	80%	100%	300%
Volume	m^3/annum	769 000	1 538 000	2 307 000	3 076 000	3 845 000	11 535 000
Amount	R / annum	R 7 690 000	R 15 380 000	R 23 070 000	R 30 760 000	R 38 450 000	R 115 350 000
Total	R / annum	R 11 348 652	R 22 697 304	R 34 045 956	R 45 394 608	R 56 743 260	R 170 229 780
						Payback period - years	0.7

7 CONCLUSIONS

Results from the study are summarised as follows:

- There is a large part of the study area which has formal infrastructure which enables effective metering and billing;
- The average consumption in the urban areas is very high and there is scope for reduction, which is expected to reduce the total demand and non-revenue water;
- The rural areas are characterised by intermittent supply with limited cost recovery and consumers revert to illegal connections to obtain water;
- The average consumption in the rural areas is within the acceptable range but there is huge inequality of supply. Any reduction will be redistributed with limited or no reduction in the total demand;
- The water tariffs in certain areas are not cost reflective and do not promote water conservation and water demand management;
- The municipalities lack funding to implement WC/WDM;
- The municipalities require additional staff to address and implement WC/WDM;
- Asset management lacks in some of the areas, which impacts on the assurance of supply; and
- Municipalities are grant dependant and have very high debtors.

Based on the above the following key strategic focus areas are recommended :

- Raise WC/WDM awareness within the organisation by setting-up a WC/WDM task team, chaired by senior officials or MMC to meet on monthly basis to address WC/WDM issues;
- Fill vacant positions and provide training and capacity building;
- Improve metering, reading, billing and cost recovery;
- Review the water tariff structure to be most cost reflective and promote WC/WDM;
- Improved tariff structures and cost recovery will increase revenue for the municipality which can be used to address the backlog in maintenance and improve service delivery;
- Implementing metering and cost recovery in the rural areas present several challenges and fixing internal plumbing leakage using local plumbers is recommended until the systems have stabilised and service delivery has improved;
- Implement awareness campaigns across all consumers to use water efficiently; and
- Improve management information through proper monthly reporting and records keeping. These reports should be discussed at the monthly EXCO meetings.

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Appendix A : Vhembe DM Strategies and Business Plans

water affairs

Department:
Water Affairs
REPUBLIC OF SOUTH AFRICA

Department of Water Affairs

Water Demand Management Strategy and Business Plan

for Makhado Local Municipality

May 2013

WCWDM STRATEGY AND BUSINESS PLAN: Signature Page

Title :	**Development of a Water Conservation and Water Demand Management Strategy and Business Plan for Makhado Local Municipality**			
Authors :	**WA Wegelin, Z Siqalaba, N Zondo**			
Study Name:	**Development of a First Order Water Conservation and Water Demand Management Strategy and Business Plan for Various Municipalities under the DWA Levuvhu Letaba Programme : Limpopo Province**			
Status of Report :				
Consultants :	**WRP Consulting Engineers (Pty) Ltd**			
Approved for Consultants :	Study leader	WA Wegelin, PrEng		
	Position	**Name**	**Signature**	**Date**
Municipality	**Makhado**			
Approved for municipality :	Municipal Manager			
	Position	**Name**	**Signature**	**Date**
Department of Water Affairs	**Limpopo Region**			
Approved for Regional Office :				
	Position	**Name**	**Signature**	**Date**
Department of Water Affairs	**Head Office**			
Approved for Head Office				
	Position	**Name**	**Signature**	**Date**

WCWDM STRATEGY AND BUSINESS PLAN: Contact details

Province	**Limpopo**		**No**
Municipal Code	**LIM344**		**B4**
District Municipality	**Vhembe**		
Municipality	**Makhado**		
Settlements	**Bandelierkop, Elim, Ha-Mogoro, Levubu, Makhado (Louis Trichardt), Mara, Oorwinning, Ratombo,**		

Information provided by			
Date	08/03/2012		
Contact person	Thivhonali Rarulimi		
Position	Manager (Water Services)		
Telephone	082 901 2873		
E-mail	thivhonalir@makhado.gov.za		
Study team contact			
Company	WRP Consulting Engineers		
Address	PO Box 1522, Brooklyn Square, 0075		
Contact person	Mr Willem Wegelin		
Telephone number	012 346 3496	**Cell number**	083 4477 999
E-mail	willemw@wrp.co.za		

Water Affairs contact			
Directorate	Water Use Efficiency		
Address	Private Bag X313, Pretoria, 0001		
Contact person	Koena Given Moabelo		
Telephone number	012 336 8174	**Cell number**	082 653 9216
E-mail	MoabeloK@dwa.gov.za		

Water Balance Data Confidence Level (see legend below)	
Input volume	Estimated values
Authorised consumption (Engineering functions)	Estimated values
Meter reading and billing (Finance functions)	Estimated values
Legend	
High level of accuracy	Calibrated bulk meters, >98% of consumers are metered < 10 years old, <2% billing complaints
Medium level of accuracy	Functional bulk meters, >90% of consumers are metered, <10% billing complaints
Low level of accuracy	Some functional bulk meters, >50% consumer meters, any age, meter reading & billing dysfunctional
Estimated values	No bulk or consumer meter readings, best estimate of water consumption
No data	No data and no idea of water consumption

WCWDM STRATEGY AND BUSINESS PLAN: Executive Summary

Province	Limpopo	**WSA**	No
Municipal Code	LIM344	**Category**	B3
District Municipality	Vhembe		
Municipality	Makhado		
Settlements	Bandelierkop, Elim, Ha-Mogoro, Levubu, Makhado (Louis Trichardt), Mara, Oorwinning, Ratombo, Sending,		

Executive summary

Status quo

Very limited WC/WDM activities are undertaken in the LM and there is little management information available to perform a proper assessment of the water losses and potential savings. This assessment is in line with the RPMS, Blue Drop assessments, IDP and WSDP. Most of the towns are informal with formal infrastructure in a relatively smaller area within the LM which enables limited metering, billing and cost recovery in the LM. The current metering, billing and cost recovery systems are inadequate. The engineering department in the Local Municipality is characterised by high vacancies at the operational level however the skills base is adequate.
The current estimated unit consumption of 129l/c/d is low and no significant reduction is anticipated but a more detailed analysis is required to verify this number. It seems there has been a drastic decrease in the average unit consumption in the area. The relationship with the community is generally contentious and the communities themselves are characterised by a relatively low indigent population. The consumers are not cognisant of water conservation practices.

Strategy

The municipality should focus on proper record keeping, analysis and development of detailed management information. All vacancies must be filled as a matter of priority together with skills transfer and capacity building. The engineering and finance department must work closer together at the LM and DM level to improve metering, billing and cost recovery and start with a meter audit to further improve cost recovery. A steering committee should be setup to report on a monthly basis to council on water loss figures, leaks repaired, targets, progress, consumer metering, billing and cost recovery.
Proper metering, billing and cost recovery should be supported by community awareness that promotes reporting of leaks, fixing of private leaks and efficient use. Based on the available information, a target reduction in NRW of 96.6% down to 63.7% and target input volume reduction of 32.9% have been set. Review the water tariff structure to ensure it reflects true cost, promote WCWDM and work towards compliance with RPMS and improve IDP.

Business Plan

The budget requirements for the next five years are summarised in the table below:

Intervention	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Institutional	350 000	150 000	350 000	150 000	150 000	1 150 000
Financial	28 726 300	28 626 300	28 626 300	28 526 300	28 526 300	143 031 500
Social	12 745 860	12 545 860	12 545 860	12 545 860	12 545 860	62 929 300
Technical	43 539 160	43 339 160	42 926 660	42 926 660	42 916 660	215 648 300
Total	**85 361 320**	**84 661 320**	**84 448 820**	**84 148 820**	**84 138 820**	**422 759 100**

Compliance

Results from the Regulatory Performance Measurement System (RPMS)

Key Performance Indicators	Achieved KPI Score	Required score	Performance assessment
KPI 1: Access to water supply [Overall KPI compliance score]	1.87	3.00	Concern
KPI 2: Access to sanitation [Overall KPI compliance score]	3.11	3.00	Adequate
KPI 3: Access to Free Basic Water [Overall KPI compliance score]	5.00	3.00	Excellent
KPI 4: Access to Free Basic Sanitation [Overall KPI compliance score]	0.00	3.00	Crisis
KPI 5: Drinking Water Quality management [Overall KPI compliance score]	1.00	3.00	Crisis
KPI 6: Wastewater quality management [Overall KPI compliance score]	0.00	3.00	Crisis
KPI 7: Customer service quality [Overall KPI compliance score]	3.50	3.00	Good
KPI 8: Institutional effectiveness [Overall KPI compliance score]	3.28	3.50	Concern
KPI 9: Financial performance [Overall KPI compliance score]	0.57	4.00	Crisis
KPI 10: Strategic asset management [Overall KPI compliance score]	3.38	3.00	Good
KPI 11: Water use efficiency [Overall KPI compliance score]	0.00	3.00	Crisis

Results from Blue and Green Drop Assessments

Assessment	Year	Microbiological	Chemical	Physical & Organoleptic	Operational	Total
Blue drop	2010	0.00%	0.00%	0.00%	0.00%	0.00%
Green drop	2010	0.00%	0.00%	0.00%	0.00%	0.00%

WCWDM STRATEGY AND BUSINESS PLAN: Municipal Water Conservation and Water Demand Management Implementation Process Map

Strategy and Planning Phase

Performed by WCWDM Strategy Steering Committee (MEC, Municipal Manager, Technical and Financial Directors)
Reviewed by SSC and DWA

Implementation

Performed by Department
Reviewed by SSC and DWA

Monitoring and Review

Performed by Department
Reviewed by SSC and DWA

Vision

Water Services Act, 108 of 1997

Provide water services in an efficient, affordable, equitable, economical and sustainable manner to all consumers or potential consumers in its area of jurisdiction.

BIG HAIRY AND AUDACIOUS VISION
If it doesn't scare you, its not big enough

Mission

Presidential Target
(State of the Nation address 2010)

Reduce water Losses by half by 2014

Status Quo

Technical

Information on demographics, demands, water loss, level of service

Key water loss contributing factors

Key performance indicators and targets

Asset value and condition

Departmental organogram

Economic

Tariffs

Metering, billing and revenue collection status

Existing sources of funding

Social

Customer profile

Communication dynamics between WSA and consumers

Existing support structures for consumers

Level of stakeholder involvement

Institutional

Existence of approved policies

Existence of approved bylaws

Regulatory compliance

Legislative compliance

Strategy

Technical

SWOT Analysis : Strengths, **W**eaknesses, **Opportunities** & **T**hreats of technical department (human resources, processes,
Goals and objectives: Achieving water loss reduction target in terms of available resources and non-revenue water. If no target exists, then goal is to develop a target.
How : Identify key principles to achieve target (user pay, water restrictions, consumer education, etc.)
Actions : Responsible person, measurement and timelines to address SWOT analysis

Economic

SWOT Analysis : Strengths, **W**eaknesses, **Opportunities** and **T**hreats of funding sources
Goals and objectives: Allocate sufficient funding to address WCWDM
How : Identify key principles to obtain funding (improved metering and billing, cost recovery, external funding, etc.)
Actions : Responsible person, measurement and timelines to address SWOT analysis

Social

SWOT Analysis : Strengths, **W**eaknesses, **Opportunities** and **T**hreats of consumers and institution
Goals and objectives: Informed and supportive consumer and institution
How : Identify key principles to develop turn consumers into customers (political, schools, specific consumer groups, water wise, etc.)
Actions : Responsible person, measurements and timelines to address SWOT analysis

Institutional

SWOT Analysis : Strengths, **W**eaknesses, **Opportunities** and **T**hreats of policies, bylaws, political support , enforcement, Regulatory compliance
Goals and objectives: Reform organisation to support WCWDM
How : Identify key principles to obtain improve (improved political support, policies, enforcement, etc.)
Actions : Responsible person, measurement and

Business Plan

Technical

Bulk metering
Leakage control and repair
Sectorisation and zone metering
Logging and water loss monitoring
Non domestic and domestic metering and audits
Resolve intermittent supply
Pressure management
Clean out and recommission existing infrastructure
Training and capacity building

Economic

Review tariff structure
Ensure effective metering and billing system
Review CAPEX budget in terms of WDM goals
Review OPEX budget in terms of WDM goals
Develop business plan for external funding
Training and capacity building

Social

Raise awareness at political levels
Raise awareness at institutional levels
Identify and engage relevant stakeholders
Establish customer care centre
Training and capacity building
Conduct WC/WDM education and awareness
Conduct schools awareness campaigns

Institutional

Establish policies in terms of payment for services, arrears,
Establish bylaws that addresses water loss reduction and efficiency
Succession planning - ensure initiatives continue

Implementation

All Projects

Council approval of Strategy and Business Plan

Identify key stakeholders - setup working committees

Appoint PSP

Appoint contractor

Assess / determine baseline

Implement interventions

Project Quality Control

Project Financial Management

Establish record keeping and reporting processes

Assess benefits from implementation

Establish take-over procedure

Training and capacity building

Deliverables

Technical

Record keeping and reporting process
Monthly IWA Water Balance calculation for system and DMA
No visible leakage
Asset management
Comply with Regulations R509 of 2001
Responsible WCWDM individual/unit

Measurement against goals

Economic

Sufficient budget allocation
Realistic tariff setting
Efficient meter reading, billing and cost recovery process

Measurement against goals

Social

Political support
Institutional support
Informed, involved and supportive consumer

Measurement against goals

Institutional

Approved policies
Approved bylaws
Policy and bylaws enforcement
Regulatory compliance
Succession plan

Measurement aga als

Deliverables

Review and update strategy and business plan . Implement and regulate.

Detailed management information

DWA Planning and target setting, Review strategies and Business Plans and align with targets, Possible funding, Technical and Institutional Support, Develop generic Policies and bylaws, Develop Regulations and Regulate, Report to Presidency

WCWDM STRATEGY : Definitions

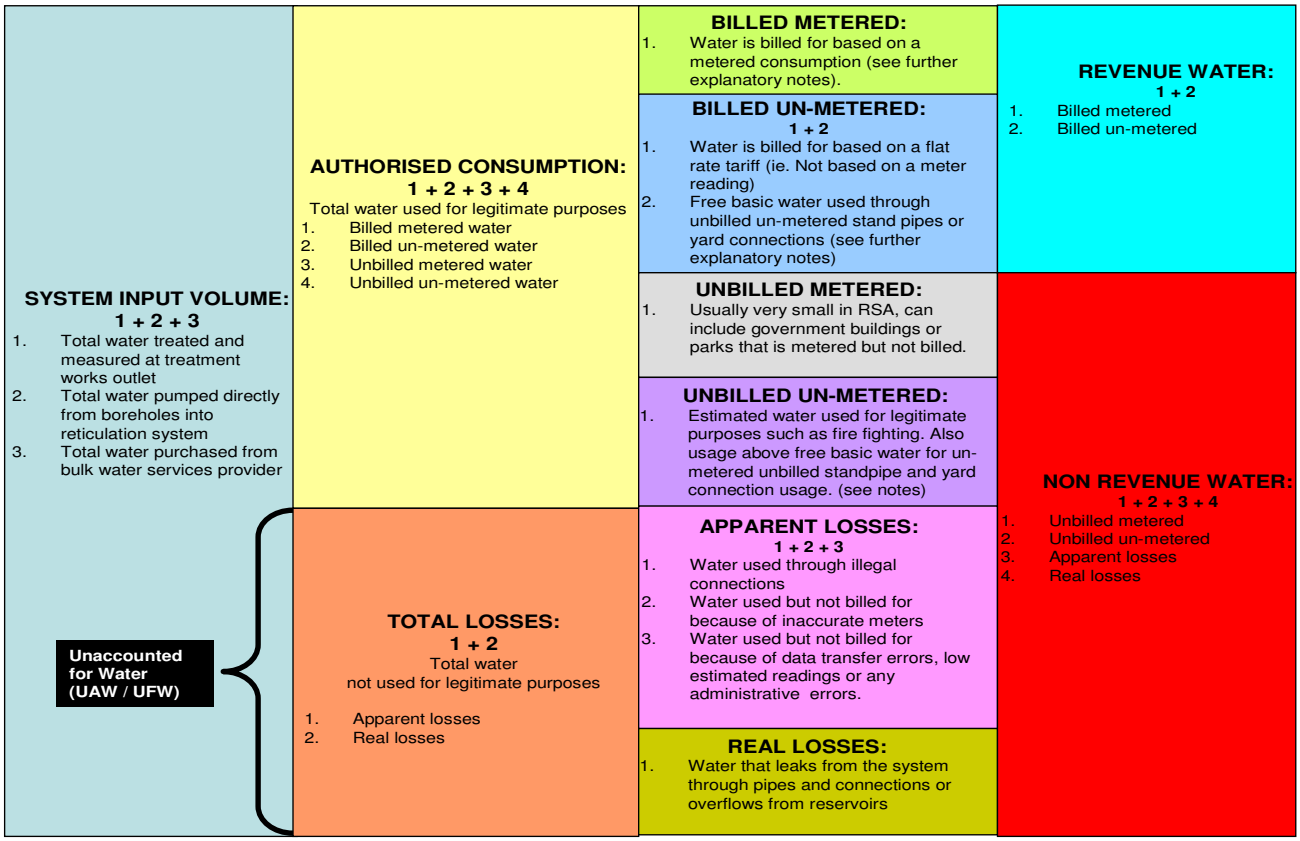
Terminology

Acronym	Description	Link
DWA	Department of Water Affairs	http://www.dwa.gov.za
WS RPMS	Water Services : Regulatory Performance Measurement System	http://www.dwa.gov.za/dir_ws/rpm/
WS NIS	Water Services : National Information System	http://www.dwa.gov.za/dir_ws/wsnis/
FBS	Water Services : Free Basic Water Project	http://www.dwaf.gov.za/dir_ws/fbw/
NRW	Non-revenue water. Volume of water for which no revenue is received (preferred term)	
UAW or UFW	Unaccounted-for water. Volume of water lost due to physical and apparent losses (not preferred term)	
StatsSA NFC	Statistics South Africa : Non-Financial Census of Municipalities P9115	http://www.statssa.gov.za/

Information sources

Item	Source	Calculation
Population	DWA WS NIS or municipality	
Households	DWA WS NIS or municipality	
Connections - metered	Extrapolated 2007 DWA - WS FBW serviced above RDP or municipality	
Connections - Unmetered	Extrapolated 2007 DWA - WS FBW serviced at RDP or municipality	
Length of mains (km)	Actual value or calculated at average of 50 connections / km of mains	# connections ÷ 50
(A) System input volume	Total volume of potable water supplied by the municipality in kl/annum	
(B) Billed metered consumption	Total volume of water metered and billed by the municipality in kl/annum	
(C) Billed unmetered consumption	Total volume of water unmetered and billed by the municipality in kl/annum	
Underlined values	Calculated values using trends or averages	

Standard IWA Water Balance



Apparent Losses

Illegal connections	%	Water Quality	Meter age and accuracy	%	Data transfer	%
Very high	10%	Very poor	> 10 years	10%	Very poor	9%
High	8%	Poor		8%	Poor	7%
Average	6%	Average	5- 10 years	6%	Average	5%
Low	4%	Good		4%	Good	3%
Very low	2%	Very good	< 5 years	2%	Very good	1%

WCWDM STRATEGY : Base Information

Municipality name	Makhado		Date of current data	2012
		Current	Target	Change
Input Data	**Demographics** IDP Ref			
	Population Par 2.4	**No**	**416 054**	**416 054**	**0**
	Urban	No	27 044	27 044	
	Rural	No	389 010	389 010	
	Households Par 2.4	**No**	**94 635**	**94 635**	**0**
	Urban	No			
	Rural	No	94 635	94 635	
	Household density	**Pop / HH**	**4.70**	**4.40**	
	Growth rate: 5 years Par 4.1.3	**%**	**4.0%**	**4.0%**	**0**
	Consumer units Par 3.3	**No**	**305**	**305**	**0**
	Residential	No		0	
	Police stations	No		0	
	Magistrates Offices	No		0	
	Business	No		0	
	Dry industries	No		0	
	Office buildings	No		0	
	Prisons	No		0	
	Schools	No	259	259	
	Health facilities	No	46	46	
	Wet industries	No		0	
	Mining	No		0	
	Resorts and tourism	No		0	
	Infrastructure				
	Water Level of Service Par 3.1	**no**	**129 665**	**129 665**	**0**
	Stand pipes	HH	60 375	60 375	0
	Yard connections	HH	69 290	69 290	
	House connections	HH			
	Length of mains (km) Par 5.1.2	**km**	**1 888.0**	**1 888.0**	**0**
	Connections / km of mains	**No / km**	**68.7**	**68.7**	
	Average system pressure	**m**			**0**
	Time pressurised	**%**		**100%**	**1**
	Sanitation Level of Service Par 3.2		**90 430**	**90 430**	**0**
	None water borne	No	90 430	90 430	
	Water borne low flush	No			
	Septic tanks / conservancy	No			
	Water borne - WTW	No			
	Apparent losses	**%**	**17%**	**17%**	**0%**
	Consumer meter age	**%**	**6%**	**6%**	**0%**
	Illegal connections	**%**	**6%**	**6%**	**0%**
	Data transfer	**%**	**5%**	**5%**	**0%**
	Water balance data				
	System input volume	**kℓ/annum**	**19 600 000**	**18 620 000**	**-980 000**
	Own sources	**kℓ/annum**	**19 600 000**	**18 620 000**	**-980 000**
	Other sources	**kℓ/annum**			**0**
	Billed metered consumption	**kℓ/annum**	**676 138**	**6 761 376**	**6 085 238**
	Billed unmetered consumption	**kℓ/annum**			**0**
	Unbilled metered consumption	**kℓ/annum**			**0**
	Unbilled unmetered consumption	**kℓ/annum**			**0**

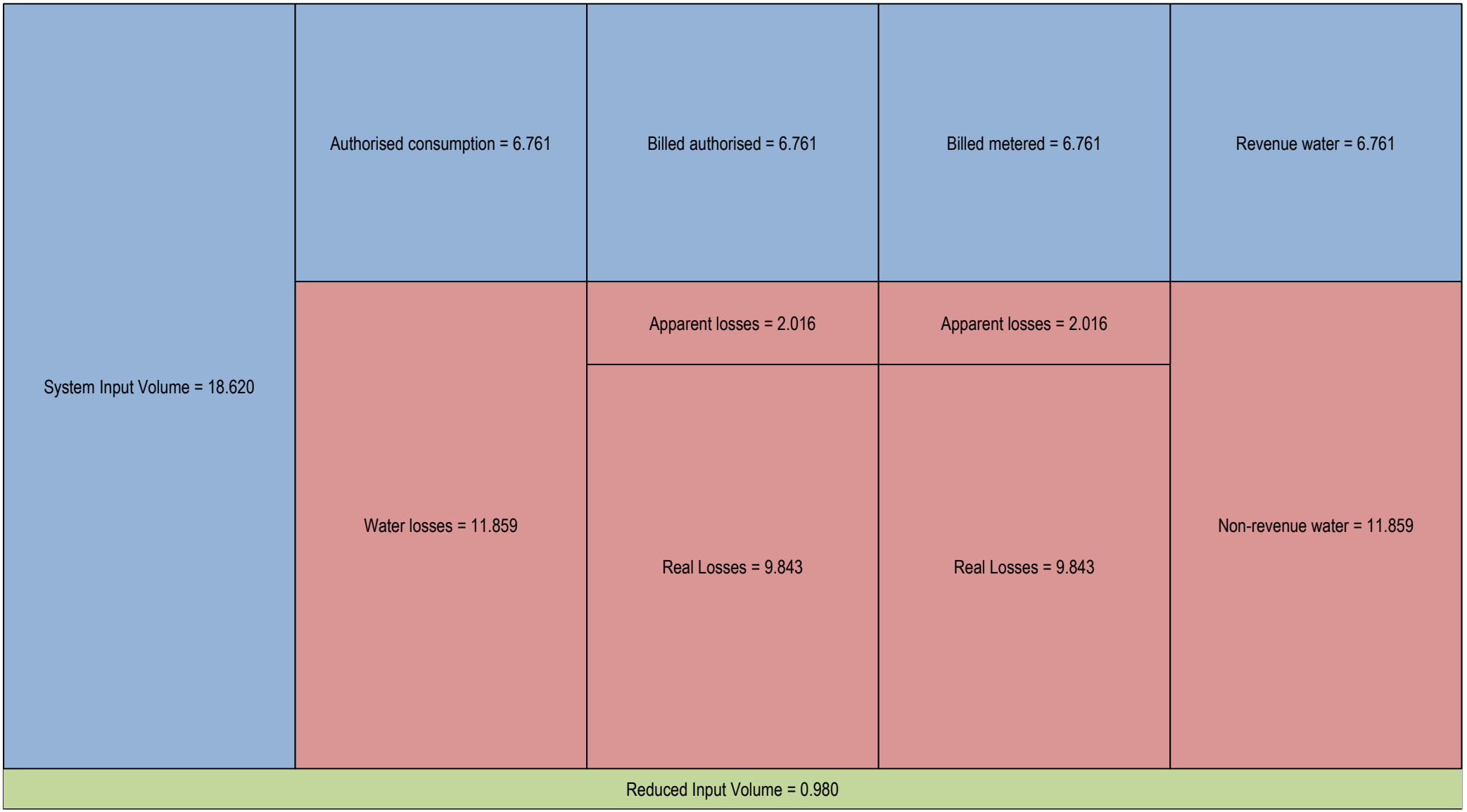
	Water Tariffs						
	Purchase of bulk water		Par 10.2	R/annum			R 0.00
	Total operating cost			R/annum			R 0.00
	Rate - Purchase of bulk water			R/kℓ	#DIV/0!	#DIV/0!	
	Rate - Total operating			R/kℓ	R 0.00	R 0.00	
	Domestic Water Tariffs		Par 10.3				
	0	to	6	kℓ/month	R 0.00	R 0.00	R 0.00
	6	to	25	kℓ/month	R 5.50	R 5.50	R 0.00
		to		kℓ/month		R 0.00	R 0.00
		to		kℓ/month		R 0.00	R 0.00
		to		kℓ/month		R 0.00	R 0.00
	>	to	25	kℓ/month	R 5.90	R 5.90	R 0.00
Water Balance Calculations	System input volume			kℓ/annum	19 600 000	18 620 000	-980 000
	Authorised Consumption			kℓ/annum	676 138	6 761 376	6 085 238
	Billed authorised			kℓ/annum	676 138	6 761 376	6 085 238
	Billed metered			kℓ/annum	676 138	6 761 376	6 085 238
	Billed unmetered			kℓ/annum	0	0	0
	Unbilled authorised			kℓ/annum	0	0	0
	Unbilled metered			kℓ/annum	0	0	0
	Unbilled unmetered			kℓ/annum	0	0	0
	Water losses			kℓ/annum	18 923 862	11 858 624	-7 065 238
	Apparent losses			kℓ/annum	3 217 057	2 015 966	0
	Real losses			kℓ/annum	15 706 806	9 842 658	-7 065 238
	UARL			kℓ/annum	0	0	0
	Potential real loss saving			kℓ/annum	15 706 806	9 842 658	-7 065 238
	Revenue water			kℓ/annum	676 138	6 761 376	6 085 238
	Non-Revenue water			kℓ/annum	18 923 862	11 858 624	-7 065 238
Key Performance Indicators	System input volume unit consumption						
	litres / capita / day			ℓ / c / d	129	123	-6
	m³ / household / month			m³ / hh / month	17	16	-1
	m³ / connection / month			m³ / conn / month	13	12	-1
	Authorised unit consumption						
	litres / capita / day			ℓ / c / d	4	45	41
	m³ / household / month			m³ / hh / month	1	6	5
	m³ / connection / month			m³ / conn / month	0	4	4
	Water loss indicators						
	UARL : Losses / connection / day			ℓ / conn / day	0	0	0
	CARL : Losses / connection / day			ℓ / conn / day	332	208	-124
	Infrastructure Leakage Index (ILI)			-	#DIV/0!	#DIV/0!	#DIV/0!
	Losses / km mains / day			m³ / km / day	22.8	14.3	-9
	Non-revenue water			%	96.6%	63.7%	-32.9%
	Unbilled Consumption			%	0.0%	0.0%	0.0%
	Water Losses			%	96.6%	63.7%	-32.9%
	Apparent losses			%	16.4%	10.8%	-5.6%
	Real losses			%	80.1%	52.9%	-27.3%
	Water balance reduction targets						
	System input volume			%		-5.0%	
	Authorised Consumption			%		900.0%	
	Billed authorised			%		900.0%	
	Billed metered			%		900.0%	
	Billed unmetered			%		0.0%	
	Unbilled authorised			%		0.0%	
	Unbilled metered			%		0.0%	
	Unbilled unmetered			%		0.0%	
Cost Analysis	Average monthly water bill / connection			R / conn / month	R 0	R 0	R 0
	Estimated annual income			R / annum	R 0	R 0	R 0
	Total water supply cost			R / annum	R 0	R 0	R 0
	Net profit / loss			R / annum	R 0	R 0	R 0
	Town and description			Source	Ml/day	m^3/annum	million m^3/annum

Water Source and Treatment Capacity	Thulamela LM WTWs	Blue Drop 2011	115.46	42 142 900	42.143
	Makado LM WTWs	Blue Drop 2011	28.25	10 310 155	10.310
	Musina LM	NRW data	12.00	4 380 000	4.380
	Mutale LM	Blue Drop 2011	16.08	5 869 200	5.869
	Total		171.79	62 702 255	62.702

Current IWA Water Balance Diagram (million m^3/annum)

<table>
<tr><td rowspan="3">System Input Volume = 19.600</td><td>Authorised consumption = 0.676</td><td>Billed authorised = 0.676</td><td>Billed metered = 0.676</td><td>Revenue water = 0.676</td></tr>
<tr><td rowspan="2">Water losses = 18.924</td><td>Apparent losses = 3.217</td><td>Apparent losses = 3.217</td><td rowspan="2">Non-revenue water = 18.924</td></tr>
<tr><td>Real Losses = 15.707</td><td>Real Losses = 15.707</td></tr>
</table>

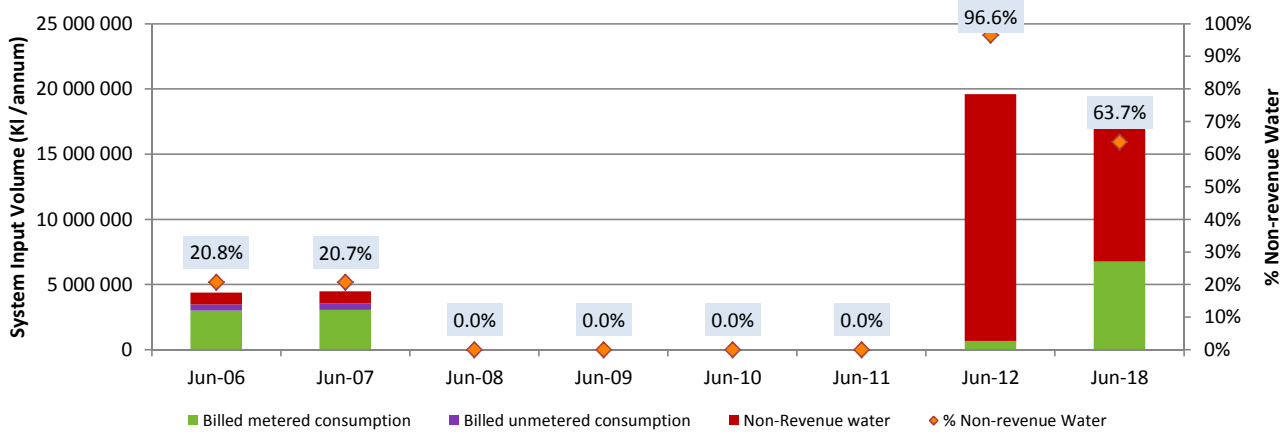
Target IWA Water Balance Diagram (million m^3/annum)



WCWDM STRATEGY : Water Balance History

Municipality Name	Makhado

			Year ending	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	Jun-11	Jun-12	Jun-18
Input Data	Population			526 127	529 281	533 242	536 438	494 267	494 268	416 054	526 441
	Households			121 456	122 181	123 099	123 836	114 092	114 093	94 635	119 743
	Connections - metered			61 101	61 467	61 927	62 298	57 401	59 697	62 085	78 557
	Connections - Unmetered			31 484	31 672	31 910	32 101	29 575	30 758	31 989	40 476
	Length of mains (km)			1 852	1 863	1 877	1 888	1 740	1 809	1 881	2 381
	System input volume	kl/annum		4 372 026	4 469 761					19 600 000	18 620 000
	Billed metered consumption	kl/annum		2 996 400	3 056 328					676 138	6 761 376
	Billed unmetered consumption	kl/annum		468 000	487 656						
	Unbilled metered consumption	kl/annum									
	Unbilled unmetered consumption	kl/annum									
Water Balance Calculations	Revenue water	kl/annum		3 464 400	3 543 984	0	0	0	0	676 138	6 761 376
	Non-Revenue water	kl/annum		907 626	925 777	0	0	0	0	18 923 862	11 858 624
	Water Losses	kl/annum		907 626	925 777	0	0	0	0	18 923 862	11 858 624
	% Non-revenue water			20.8%	20.7%	No data	No data	No data	No data	96.6%	63.7%
	% Water Losses			20.8%	20.7%	No data	No data	No data	No data	96.6%	63.7%
Key performance indicators	Input : Litres / capita / day			23	23	No data	No data	No data	No data	129	97
	Input: m³ / household / month			3	3	No data	No data	No data	No data	17	13
	Billed : Litres / capita / day			18	18	No data	No data	No data	No data	4	35
	Billed : m³ / household / month			2	2	No data	No data	No data	No data	1	5
	% Population growth			0.86%	0.60%	0.75%	0.60%	-7.86%	0.00%	-15.82%	6.51%
	% Water demand growth			16.29%	2.24%					#DIV/0!	#DIV/0!
Source of information											



Comments

WCWDM STRATEGY : Qualitative Scorecard

Municipality Name	Makhado

Introduction

The purpose of this section is to perform a qualitative evaluation of the municipality's water business. The objectives are as follows :

SWOT Analysis	External - Opportunities Positive external conditions which you don't control which you could take advantage of	External - Threats Negative conditions you don't control but could minimise their effects
Internal - Strengths Positive aspects under your control and on which you may wish to capitalise	Strengths and Opportunities (SO) – Strategies that use strengths to maximize opportunities.	Strengths and Threats (ST) – Strategies that use strengths to minimize threats.
Internal - Weaknesses Negative aspects under your control (to a large extent) which you could plan to improve	Weaknesses and Opportunities (WO) – Strategies that minimize weaknesses by taking advantage of opportunities.	Weaknesses and Threats (WT) – Strategies that minimize weaknesses and avoid threats.

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY (1) High
1	**INSTITUTIONAL REVIEW**				
1.1	**Water and Sanitation department structure**				
1.1.1	Is there an approved organogram for the Water and Sanitation Department?	Yes. The water function has however been removed because it is now a district function.	O	Review the existing organogram and ensure that it incorporates WC/WDM personnel in consultation with the District.	1
1.1.2	What is the vacancy rate in the department and is it a problem?	There is 20% vacancy rate. The Water and Sanitation manager post is vacant. No provisions could be made for additional operations staff due to the uncertainty regarding the functions of the District and Local Municipality.	T	Engage with the District and advertise and fill the identified critical vacant posts. Engage with the Department of finance at the District Level to identify and explore possible funding options and budget requirements for the critical posts.	1
1.1.3	Does the department have the correct technical skills for the correct posts.	The department is fully and correctly skilled at the managerial level but operational staff is sorely needed.	T	Increase management, and O&M capacity through new human resources and support it with WC/WDM training.	1
1.1.4	Is training and capacity building being done?	There is some training taking place related to financial management and safety.	O	Institute a mandatory WC/WDM training programme for technical staff. Invest in team building and workshop sessions incorporating the councillors and municipal management to boost staff morale.	2
1.1.5	Are there sufficient support structures ito vehicles, equipment, materials etc.?	There is not enough vehicles and equipment due to funding limitations.	T	Engage with the Department of Finance at the District level and allocate an adequate budget for the critical spares. Allocate a specific person who will be responsible for expediting equipment orders and managing quality control in terms of the procurement processes.	1

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY (1) High
1.1.6	Does the municipality own any water loss control equipment such as loggers, listening sticks, etc.?	There is no water loss equipment.	O	It is recommended that loggers and simple leak detection equipment be purchased to improve water loss monitoring and management in the system.	3
1.2	**Municipal support**				
1.2.1	Describe the working relationship with other departments such finance, planning, housing etc.?	There is a reasonable working relationship with department of finance but exception reports are not received by the technical department.	O	Establish a NRW steering committee comprising representatives from the technical, communications and finance departments to improve communication and access to information.	1
1.2.2	Are the politicians supporting the department?	The politicians especially the portfolio head is very supportive but training is required.	O	Undertake a councillor WC/WDM induction programme to capitalise on the existing relationship and build a communication bridge between the municipality and the customers.	2
1.3	**Public Private Partnerships**				
1.3.1	Is there any major industrial or institutional role player in the area and is there co-operation?	There are a few possible mines which may come into the area but there is no existing potential currently.			
1.3.2	If yes, what does the co-operation involve and can it be expanded?				
1.4	**Legislation and bylaws**				
1.4.1	Does the municipality have a customer service charter?	No.	O	Develop a customer service charter to ensure the customers are aware of the municipality's commitment and their responsibilities as consumers.	3
1.4.2	What is the status and age of the existing bylaws and do they address water loss management?	There are bylaws are in place for Makahdo. The bylaws are currently under review.	O	Utilise the bylaw review process to ensure that WC/WDM issues are captured and addressed by the new by laws being developed.	2
1.4.3	Are bylaws enforced and if not, why not?	The bylaws are enforced particularly in town.	S	Continue to enforce the bylaws particularly for the large commercial consumers to ensure effective cost recovery.	1
1.4.4	What is the status and age of Water Services Development Plan?				
2	**FINANCIAL REVIEW**				
2.1	**Financial Department**				
2.1.1	What is your opinion of the Finance Department's ability to perform metering and billing	A service provider was appointed to perform this duty for the past 3 years but a new one will be appointed in the near future.	O	Improve communication and access to information between the technical and finance department through scheduled monthly team meetings in order to fully utilise this resource. Include the service provider in these meetings and stipulate that they present management reports on a monthly basis.	1
2.1.2	Is training and capacity building being done?				
2.1.3	What is the state of the municipal metering and billing system?				

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY (1) High
2.1.4	What is your primary source of funding?	The equitable share and internal revenue, rates and taxes.	O	Focus on improving cost recovery to continuously reduce dependency on grant funding.	2
2.2	**Tariffs**				
2.2.1	Who prepares the water tariffs and what is it based on?	Department of Finance prepares the tariffs. The technical department does not make inputs but the National Treasury guidelines are applied.	T	Ensure that the technical department makes inputs into the tariff setting process to ensure that the tariffs are feasible for the municipality and the consumers. Institute a rising block tariff sufficiently differentiated in cost at each level to promote WC/WDM with the highest tariff at least double the lowest tariff.	1
2.2.2	What is the tariff structure and does it promote WCWDM?				
2.2.3	Is the water supplied considered affordable by the customers?	The consumers feel the water is affordable.	S	Continue ensuring that the tariffs remain affordable particularly for the efficient and low income water users.	1
2.3	**Meter Reading and Billing**				
2.3.1	Who performs the water meter readings, frequency and accuracy?	There is an external service provider who does this on a monthly basis. The accuracy of the meter readings is questionable (frequent complaints from consumers).	T	Continue to monitor the frequency of meter reading and customer complaints of inaccurate billing to determine the effectiveness of the existing meter reading contractor. Stipulate the provision of proper training for the meter readers to improve the accuracy or alternatively replace the meter reading contractor.	1
2.3.2	Are the meter readers trained and can they report leakage when encountered on site?				
2.3.3	Is the water bill understandable and informative?	The bill is comprehensible but it can still be improved.	O	Consider including water conservation tips and information in the water bill. It is also recommended to display 6 months graphical consumption data on the bill to aid consumers in effectively monitoring water use.	3
2.4	**Credit control**				
2.4.1	Is credit control being implemented and by whom?				
2.4.2	What is the current level of non-payment?	Non payment levels are high. Availability of the data to the municipalities is lacking, people are unwilling to pay for water and are saying that the level of service is unacceptable. The consumers are on intermittent supply. The Eastern part of Makhado is restricted to getting water at certain times.	O	Focus on promoting payment for services in the township areas through the councillors and education and awareness. Improve the quality of service through obtaining proper management information and monitoring the zones on a monthly basis.	1
3	**SOCIAL REVIEW**				
3.1	**Customer profile**				

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY (1) High
3.1.1	Describe the general consumer profile i.e. Income levels, indigence, unemployment, literacy	Indigence levels are not necessarily high in the municipality. The challenge is the availability of billing information which was not captured when the old Venda government ceased to exist.	O	Focus on educating the indigent population on efficient water use and the importance of the free basic allocation as well as its limitations.	1
3.1.2	Describe the relationship between customers and the municipality and reasons?	The relationship between the municipality and the community varies between areas. Significant tension does exist in certain areas due to unhappiness with service.	T	Engage with the consumers through the councillors and gain their support and cooperation whilst the municipality resolves the water services challenges. Build on the relationship with all the consumers and strengthen it through community awareness campaigns.	1
3.2	**Customer awareness**				
3.2.1	Are consumers informed regarding the value of water?	The consumers are not very well informed regarding the value of water.	T	Budget and undertake a continuous annual education and awareness campaign focusing on promoting water use efficiency.	2
3.2.2	What is the level of leakage reporting by the community and what method do they use?	The levels of leakage reporting are high in the town area.	O	Ensure that the customer care line is continuously publicised to further encourage reporting of leakage.	3
3.2.3	What are the most prominent consumer behavioural challenges encountered by the municipality?	The rate of vandalism particularly at the pump stations and boreholes is high.	T	The community awareness campaign should be tailored to address these problems. The councillors should be encouraged to make these issues an agenda at all public metering held in the different wards.	2
3.2.4	Is xeriscaped gardening and rain water harvesting encouraged?	Rain water harvesting is currently not publicly promoted however it is taking place in the rural areas.	O	As part of a community awareness campaign, encourage consumers to harvest rain water and utilise it for garden irrigation and cleaning to reduce the demand for potable water.	2
3.2.5	Are radio campaigns, bill board, pamphlets, informative billing used to inform and educate customers?	Local news paper publications are produced on average twice a year specifically addressing water restrictions.	O	Develop simple visual material in the form of pamphlets which can be used to educate consumers on efficient water use. Build on the media campaign undertaken and periodically publicise water tips on local radio stations and newspapers.	2
3.3	**Schools awareness**				
3.3.1	Number of primary and secondary schools?				
3.3.2	Frequency and scope of schools awareness campaigns?	The Community Services Department does this on a quarterly basis.	O	Huge benefit can be derived from the expansion of the schools programme. The section 21 schools in particular should be visited, monitored and encouraged to fix leakage as the O&M budgets are operated by the school management for this category of schools.	3
3.3.3	Are goals and objectives monitored and controlled?	No. Most of the schools in the rural areas were encouraged to have water tankers and the water is billed.	O	Establish a relationship with schools. Monitor their consumption and undertake education and awareness.	3

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY (1) High
3.4	**Customer Care Centre**				
3.4.1	Does the municipality have a CCC and who operates it?	There is a customer care line in place for reporting purposes.	**O**	Publicise the call centre and encourage the consumers to become the eyes and ears of the municipality and to report water and sanitation related problems.	**2**
3.4.2	How and to whom are billing queries referred?	Finance is called for billing queries.	**O**	Obtain an electronic system to capture and monitor the queries referred and to track the resolution of the queries.	**2**
3.4.3	To whom are the leak reports referred and do consumers have confidence in the reporting system?	There is a 24 hr. number for leakage reporting in town and satellite offices in the township for reporting during office hrs.	**S**	The customer care personnel should receive training on WC/WDM to ensure that they are knowledgeable and equipped to assist the consumers. This will help to improve the communication between the municipality and the community.	**2**

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY (1) High
4	**TECHNICAL REVIEW**				
4.1	**Measurement and control**				
4.1.1	Is the system input volume measured, monitored and controlled?	The transfer of data between the District and the Local authorities has been a huge problem. The are currently no bulk meters in place. Moorkop has a 12 ML reservoirs, and the new reservoir is 10 ML.	**W**	Install bulk meters as a matter of priority. Read bulk meters on a monthly basis and monitor input volumes.	**1**
4.1.2	Is the water supply system sectorised into zones and districts?	No sectorisation.	**W**	The water supply system must be sectorised into manageable sized areas to allow for improved monitoring.	**2**
4.1.3	Are the supply to the zones and districts metered?	No sectorisation has taken place.	**W**	Zone meters must be installed and read on a monthly basis. The readings must be captured on a spread sheet.	**2**
4.1.4	Is the system monitored through a telemetry system?	There used to be a telemetry in place but it does not exist anymore.	**O**	Obtain an appropriate real time telemetry system to improve the monitoring of the network.	**2**
4.1.5	What is the Frequency and detail of your water balance calculation?	Water balance calculations are currently not being undertaken.	**W**	Develop an NRW water balance which must be updated on a monthly basis to monitor water losses.	**1**
4.1.6	Are minimum night flows, consumption trends and logging used to monitor the system?	No.	**O**	Obtain and install logging equipment periodically on the zone meters once they have been installed and conduct MNF analysis to determine leakage levels and areas experiencing high or low pressures.	**3**
4.1.7	Are monthly management reports prepared and key performance indicators measured?	No.	**O**	Consolidate the available data from the bulk meters and department of finance and compile a monthly NRW report with the relevant KPI's.	**1**
4.2	**Physical leakage**				
4.2.1	What is the average age of the network, pipe material, replacement programme?	There is no maintenance and no asset management programme in place. The pipes are very old and they are mainly lines asbestos cement.	**T**	Set aside 5% of the CAPEX budget for the replacement of the network.	**1**
4.2.2	Number of burst pipes reported and repaired per week / month and the average response time?	2-3 times a month.	**O**	Ensure that pipe bursts are repaired within a 48 hour period.	**2**
4.2.3	What is the primary cause of burst pipes?	The network is old.	**T**	Allocate a proper budget for replacement and refurbishment. Budget a minimum of 5% of the infrastructure value for this purpose to reduce the risk of system failure. Also consider implementing pressure management in areas with high burst frequencies.	**1**
4.2.4	Are active leak detection programmes conducted?	There is no active leak detection taking place.	**O**	Undertake active leak detection on the network on an annual basis. Select appropriate areas for the leak detection exercise based on the district meter readings and monitoring process once sectorisation has taken place. As a first phase, focus on visual leak detection.	**3**

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY (1) High
4.2.5	How often and for how long do reservoirs overflow?	The reservoirs don't overflow, there isn't enough water.	O	Continue to monitor the reservoirs on a monthly basis. Undertake an annual audit on the condition of the reservoirs.	3
4.2.6	Are water losses from treatment processes (backwash, etc.) monitored and minimised?				
4.2.7	Is leakage on private properties a problem and if so, why?	Internal plumbing leakage is a significant problem in the Municipality.	T	Undertake an internal leak audit in critical areas to accurately determine the extent of water losses and do a cost benefit analysis to assess the merit of periodically performing leak repairs for indigent consumers.	1
4.2.8	Are leaks on indigent private properties repaired and removal of wasteful devices encouraged?	The Municipality currently does not repair internal plumbing leakage.	T	Review existing indigent policy and consider undertaking an internal leak audit and repair exercise for indigent and non paying consumers to drastically reduce the NRW.	1
4.3	**Pressure management and control valves**				
4.3.1	What is the average and maximum system pressure?	Uncertain.			
4.3.2	Is basic or advanced pressure management being implemented?	No pressure management is currently taking place. The main line to Albason has high operating pressures.	O	Consider undertaking logging in areas experiencing high burst frequencies and monitor on a monthly basis. If the pressures are high for the area or exceed the regulations stipulated 9 bar, install pressure reducing valves to regulate the pressures more effectively.	2
4.3.3	Are control valves pro-actively being maintained to prevent overflowing reservoirs?	No.	W	Existing control valves must be maintained or recommissioned to assist in the monitoring of reservoirs and the network.	1
4.4	**Consumer metering**				
4.4.1	Are domestic and non-domestic consumers metered and which type of meter is used?	Vhuwani, WaterVaal , Tsanani and Vleifontein are metered. Less than 10% of the domestic consumers are billed.	O	Meter and bill 100% of non domestic connections as a priority and increasingly meter and bill the domestic consumers where practicable to increase revenue water.	1
4.4.2	What is the condition, age and accuracy of water meters?	The meters are generally older than 10 years. They are replaced reactively as and when required.	O	Budget and implement a meter replacement programme particularly for bulk and non domestic consumers to improve cost recovery.	1
4.4.3	Are the top consumers pro-actively monitored on a monthly basis?	No.	O	Undertake a non domestic consumer audit and monitor billing information for non domestic consumers on a monthly basis.	2
4.4.4	Describe the water quality and its impact on consumer water meters?				
4.4.5	What is the prevalence and control of illegal connections?	Illegal connections are a big concern particularly in the domestic consumer sector.	T	Actively monitor illegal connections and periodically undertake an audit on the meters. This can be conducted by the meter readers.	1
4.5	**Management information**				

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY (1) High
4.5.1	Does the Municipality have an asset register and asset management programme?	There is an asset register which sits with the District.	S	Review the asset register system in place. Maintain and update the asset register on an annual basis. Ensure that the asset register provides critical technical information such as the age, value and replacement date of the assets.	2
4.5.2	What is the status and age of as-built drawings?	Very few as built drawings available. Water affairs kept the drawings for the rural schemes and its uncertain whether they were transferred.	T	Develop electronic as built drawings for the whole network.	2

Summary

SWOT Analysis	Helpful	Harmful
Internal factors (Staff, infrastructure, tools, equipment)	Bylaw enforcement Effective customer complaints system Well skilled technical department Asset register in place	High vacancy rate particularly in operations and maintenance Limited materials to undertake operations and maintenance No bulk meters Old dilapidated network No sectorisation Limited as built drawings No management reports are generated Old meters No proactive monitoring of top consumers Intermittent supply in parts of the network
Internal factors (Politics, finance, consumers, economics)	Effective billing system Affordable tariffs for consumers Good political support Undertake education and awareness Undertake councillor training Repair Internal plumbing leakage Undertake a domestic audit to detect illegal connections	Illegal connections are a significant problem High levels of household plumbing leakage Low levels of water conservation awareness in the community

WCWDM STRATEGY : Quantitative Scorecard

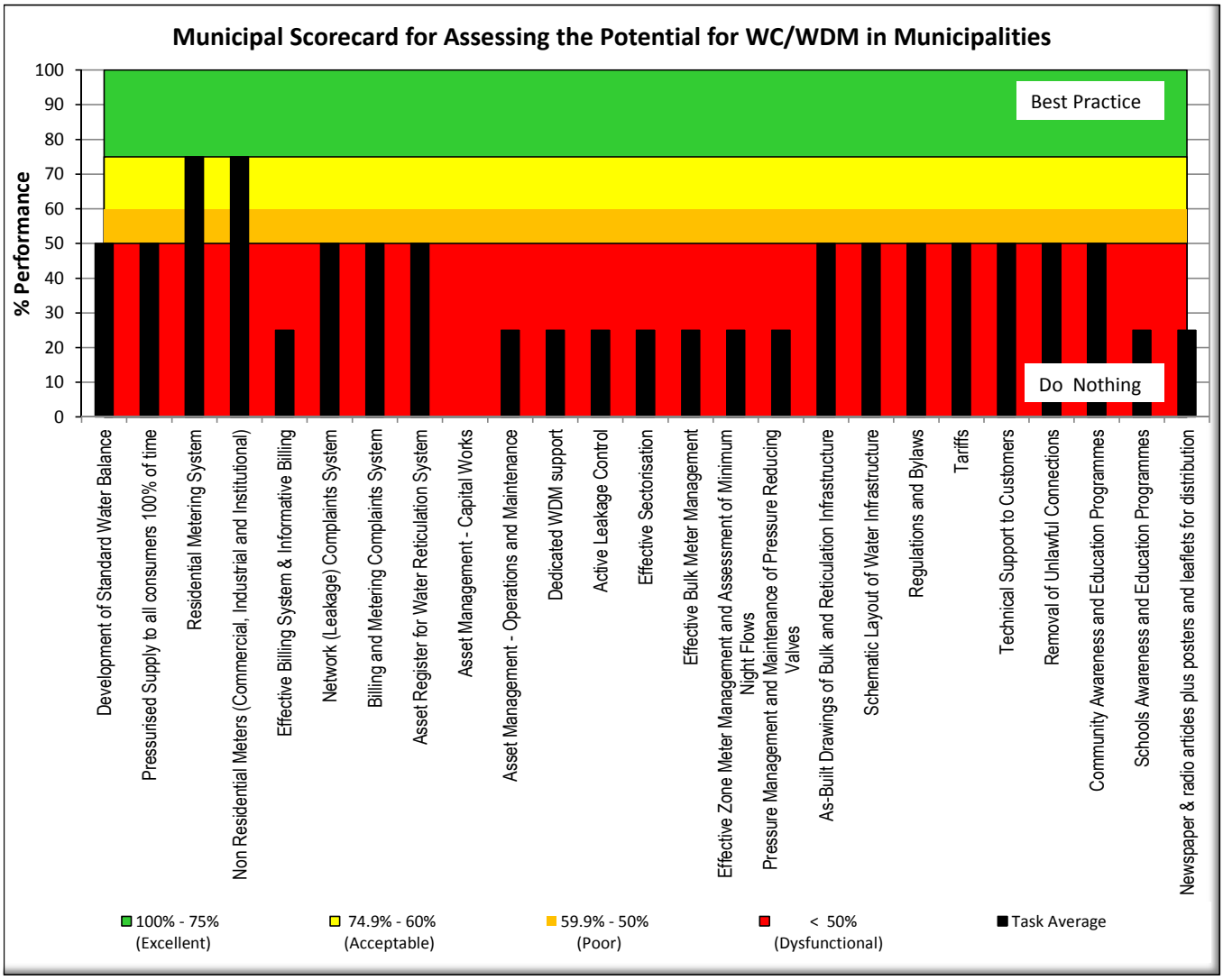
Municipality Name	Makhado

Introduction

The purpose of the Water Conservation / Water Demand Management (WC/WDM) Scorecard is to ascertain the status quo of WC/WDM and evaluate the potential for WC/WDM measures to be implemented in these systems. The scorecard is also designed to enable the Regulator (Department of Water Affairs) to assess the current situation regarding losses and levels of wastage in all water supply systems countrywide. The scorecard consists of 25 multiple choice questions with each question getting scored from 0 to 4. The Regulator and WSA can track progress with each year the scorecard gets completed. Each question ends with an audit requirement which indicates what will be required by the Regulator should the questionnaire be audited. It also provides an indication on what is required in terms of each of the measures.

Completed by					
Date	Mar-12				Average
1. Development of Standard Water Balance	2				2
2. Pressurised supply to all consumers 100% of time	2				2
3. Residential Metering System	3				3
4. Non Residential Meters (Commercial, Industrial and Institutional)	3				3
5. Effective Billing System & Informative Billing	1				1
6. Network (Leakage) Complaints System	2				2
7. Billing and Metering Complaints System	2				2
8. Asset Register for Water Reticulation System	2				2
9. Asset Management - Capital Works	0				0
10. Asset Management - Operations and Maintenance	1				1
11. Dedicated WDM support	1				1
12. Active Leakage Control	1				1
13. Effective Sectorisation	1				1
14. Effective Bulk Meter Management	1				1
15. Effective Zone Meter Management and Night Flow Analysis	1				1
16. Pressure Management and Maintenance of Pressure Reducing Valves	1				1
17. As-Built Drawings of Bulk and Reticulation Infrastructure	2				2
18. Schematic Layout of Water Infrastructure	2				2

Date	Mar-12				Average
19. Regulations and Bylaws	2				2
20. Tariffs	2				2
21. Technical Support to Customers	2				2
22. Removal of Unlawful Connections	2				2
23. Community Awareness and Education Programmes	2				2
24. Schools Awareness and Education Programmes	1				1
25. Newspaper & radio articles plus posters and leaflets for distribution	1				1
Total score (maximum 100)			0	0	40



WCWDM STRATEGY AND BUSINESS PLAN : BUDGET AND CASH FLOW

Municipality name	Makhado

COSTS

Item		Unit	Quantity / year	Rate	Year 1	Year 2	Year 3	Year 4	Year 5	Total
INSTITUTIONAL / LEGISLATIVE INTERVENTIONS										
Institutional review:					100%					100%
CAPEX	Review organogram and fill vacancies	Sum	1	R 200 000	R 200 000	R 0	R 0	R 0	R 0	R 200 000
OPEX		Sum			R 0	R 0	R 0	R 0	R 0	R 0
Training and education :					50%	50%				100%
CAPEX	Not applicable	No		R 0	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Assume one training course / employee / annum	No	10	R 5 000	R 50 000	R 50 000	R 50 000	R 50 000	R 50 000	R 250 000
Customer charter, policy, bylaws :							100%			100%
CAPEX	Review bylaws on 5 year cycles	Sum	1	R 200 000	R 0	R 0	R 200 000	R 0	R 0	R 200 000
OPEX	Enforce bylaws	Sum	1	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 500 000
FINANCIAL INTERVENTIONS										
Effective metering and billing :					50%	50%				100%
CAPEX	Perform meter audit	No		R 0	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Ensure proper metering and billing of all consumers	No	129 665	R 100	R 12 966 500	R 12 966 500	R 12 966 500	R 12 966 500	R 12 966 500	R 64 832 500
Water tariffs :					50%		50%			100%
CAPEX	Review water tariffs	Sum	1	R 200 000	R 100 000	R 0	R 100 000	R 0	R 0	R 200 000
OPEX	Not applicable	Sum		R 0	R 0	R 0	R 0	R 0	R 0	R 0
Informative billing :					50%	50%				100%
CAPEX	Improve invoice to show monthly consumption	Sum	1	R 200 000	R 100 000	R 100 000	R 0	R 0	R 0	R 200 000
OPEX	Distribute information with bill	Sum	129 665	R 120	R 15 559 800	R 15 559 800	R 15 559 800	R 15 559 800	R 15 559 800	R 77 799 000
SOCIAL INTERVENTIONS										
Consumer Awareness Campaign :					20%	20%	20%	20%	20%	100%
CAPEX	Install bill boards, design pamphlets, radio campaigns	Sum	129 665	R 120	R 3 111 960	R 3 111 960	R 3 111 960	R 3 111 960	R 3 111 960	R 15 559 800
OPEX	Target households on monthly basis with awareness cam	No	129 665	R 60	R 7 779 900	R 7 779 900	R 7 779 900	R 7 779 900	R 7 779 900	R 38 899 500
Consumer Help and Support Desk :					100%					100%
CAPEX	Improve existing help-desk to provide one-stop service	Sum	1	R 200 000	R 200 000	R 0	R 0	R 0	R 0	R 200 000
OPEX	Maintain help-desk	Sum	1	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 500 000
Schools awareness :					20%	20%	20%	20%	20%	100%
CAPEX	Prepare schools competition, awareness, retrofit	No	259	R 20 000	R 1 036 000	R 1 036 000	R 1 036 000	R 1 036 000	R 1 036 000	R 5 180 000
OPEX	Monthly schools awareness campaign	No	259	R 2 000	R 518 000	R 518 000	R 518 000	R 518 000	R 518 000	R 2 590 000

TECHNICAL INTERVENTIONS										
Bulk metering :					50%	50%				100%
CAPEX	New meter installations required	No		R 50 000	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Maintenance of existing bulk meters	No		R 1 000	R 0	R 0	R 0	R 0	R 0	R 0
Sectorisation :					50%	50%				100%
CAPEX	Setup of new DMA / PMAs	No	4	R 50 000	R 100 000	R 100 000	R 0	R 0	R 0	R 200 000
OPEX	Maintenance of DMA / PMAs including step testing	No	4	R 25 000	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 500 000
Active Leakage Control :					50%	50%				100%
CAPEX	Not applicable	No		R 0	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Fix all visible and reported leaks	No	1 888	R 1 000	R 1 888 000	R 1 888 000	R 1 888 000	R 1 888 000	R 1 888 000	R 9 440 000
Valve audits					20%	20%	20%	20%	20%	100%
CAPEX	Locate, clean, repair, document network valves	No	7 552	R 4 000	R 6 041 600	R 6 041 600	R 6 041 600	R 6 041 600	R 6 041 600	R 30 208 000
OPEX	Maintain network valves	No	1 510	R 1 000	R 1 510 400	R 1 510 400	R 1 510 400	R 1 510 400	R 1 510 400	R 7 552 000
Leak and logging equipment :					25%	25%	25%	25%		100%
CAPEX	Procure basic WDM equipment	Sum	2	R 20 000	R 10 000	R 10 000	R 10 000	R 10 000	R 0	R 40 000
OPEX	Not applicable	Sum			R 0	R 0	R 0	R 0	R 0	R 0
Telemetry :						50%	50%			100%
CAPEX	Install telemetry sites	No		R 15 000	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Maintain telemetry sites	No		R 1 500	R 0	R 0	R 0	R 0	R 0	R 0
Retrofitting and removal of wasteful devices :					20%	20%	20%	20%	20%	100%
CAPEX	Retrofit government buildings, schools, etc.	No	25 933	R 1 000	R 5 186 600	R 5 186 600	R 5 186 600	R 5 186 600	R 5 186 600	R 25 933 000
OPEX	Not applicable	No		R 0	R 0	R 0	R 0	R 0	R 0	R 0
Mains replacement :					20%	20%	20%	20%	20%	100%
CAPEX	Replace critical leaking mains	km	37.8	R 100 000	R 755 200	R 755 200	R 755 200	R 755 200	R 755 200	R 3 776 000
OPEX	Not applicable	km		R 0	R 0	R 0	R 0	R 0	R 0	R 0
Pressure management :					50%	50%				100%
CAPEX	New pressure management installations	No	3	R 75 000	R 112 500	R 112 500	R 0	R 0	R 0	R 225 000
OPEX	Maintain pressure management installations	No	3	R 5 000	R 15 000	R 15 000	R 15 000	R 15 000	R 15 000	R 75 000
Control valve management :					50%	50%				100%
CAPEX	New control valve installations	No		R 0	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Maintain all control valve installations	No		R 5 000	R 0	R 0	R 0	R 0	R 0	R 0
Consumer metering :					20%	20%	20%	20%	20%	100%
CAPEX	Replacement of old water meters	No	12 967	R 1 200	R 3 111 960	R 3 111 960	R 3 111 960	R 3 111 960	R 3 111 960	R 15 559 800
OPEX	Replacement of broken and cycled water meters	No	6 483	R 1 200	R 7 779 900	R 7 779 900	R 7 779 900	R 7 779 900	R 7 779 900	R 38 899 500
Top consumer audit :					20%	20%	20%	20%	20%	100%
CAPEX	Audit and retrofit non domestic consumers	No	6 483	R 10 000	R 12 966 500	R 12 966 500	R 12 966 500	R 12 966 500	R 12 966 500	R 64 832 500
OPEX	Maintain non domestic consumers installations	No	6 483	R 500	R 3 241 500	R 3 241 500	R 3 241 500	R 3 241 500	R 3 241 500	R 16 207 500
GIS / CAD system :					50%	50%				100%
CAPEX	Setup CAD/ GIS system	Sum	1	R 200 000	R 100 000	R 100 000	R 0	R 0	R 0	R 200 000
OPEX	Maintain CAD / GIS system	Sum	1	R 200 000	R 200 000	R 200 000	R 200 000	R 200 000	R 200 000	R 1 000 000
Management Information System :					50%	50%				100%

CAPEX	Setup basic MIS system to support WDM	Sum	1	R 200 000	R 100 000	R 100 000	R 0	R 0	R 0	R 200 000
OPEX	Maintain MIS system	Sum	1	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 500 000
Water loss monitoring and audits:					100%					100%
CAPEX	Perform proper analysis of distribution network	Sum	1	R 200 000	R 200 000	R 0	R 0	R 0	R 0	R 200 000
OPEX	Perform ad hoc analysis to monitor interventions	Sum	1	R 20 000	R 20 000	R 20 000	R 20 000	R 20 000	R 20 000	R 100 000

Item	Type			Year 1	Year 2	Year 3	Year 4	Year 5	Total
TOTAL COSTS									
Institutional	CAPEX			R 200 000	R 0	R 200 000	R 0	R 0	R 400 000
	OPEX			R 150 000	R 150 000	R 150 000	R 150 000	R 150 000	R 750 000
	TOTAL			**R 350 000**	**R 150 000**	**R 350 000**	**R 150 000**	**R 150 000**	**R 1 150 000**
Financial	CAPEX			R 200 000	R 100 000	R 100 000	R 0	R 0	R 400 000
	OPEX			R 28 526 300	R 28 526 300	R 28 526 300	R 28 526 300	R 28 526 300	R 142 631 500
	TOTAL			**R 28 726 300**	**R 28 626 300**	**R 28 626 300**	**R 28 526 300**	**R 28 526 300**	**R 143 031 500**
Social	CAPEX			R 4 347 960	R 4 147 960	R 4 147 960	R 4 147 960	R 4 147 960	R 20 939 800
	OPEX			R 8 397 900	R 8 397 900	R 8 397 900	R 8 397 900	R 8 397 900	R 41 989 500
	TOTAL			**R 12 745 860**	**R 12 545 860**	**R 12 545 860**	**R 12 545 860**	**R 12 545 860**	**R 62 929 300**
Technical	CAPEX			R 28 684 360	R 28 484 360	R 28 071 860	R 28 071 860	R 28 061 860	R 141 374 300
	OPEX			R 14 854 800	R 14 854 800	R 14 854 800	R 14 854 800	R 14 854 800	R 74 274 000
	TOTAL			**R 43 539 160**	**R 43 339 160**	**R 42 926 660**	**R 42 926 660**	**R 42 916 660**	**R 215 648 300**
Total	CAPEX			R 33 432 320	R 32 732 320	R 32 519 820	R 32 219 820	R 32 209 820	R 163 114 100
	OPEX			R 51 929 000	R 51 929 000	R 51 929 000	R 51 929 000	R 51 929 000	R 259 645 000
	TOTAL			**R 85 361 320**	**R 84 661 320**	**R 84 448 820**	**R 84 148 820**	**R 84 138 820**	**R 422 759 100**
				R 85 361 320	R 84 661 320	R 84 448 820	R 84 148 820	R 84 138 820	

BENEFITS

Item	Unit			Year 1	Year 2	Year 3	Year 4	Year 5	Total
CHANGE IN CONSUMPTION									
Reduced input volume				20%	40%	60%	80%	100%	300%
Volume	m^3/annum	980 000	R 0.00	196 000	392 000	588 000	784 000	980 000	2 940 000
Amount	R / annum	980 000	R 3.50	R 686 000	R 1 372 000	R 2 058 000	R 2 744 000	R 3 430 000	R 10 290 000
Increased revenue water				20%	40%	60%	80%	100%	300%
Volume	m^3/annum	6 085 238		1 217 048	2 434 095	3 651 143	4 868 191	6 085 238	18 255 715
Amount	R / annum	6 085 238	R 7.00	R 8 519 334	R 17 038 668	R 25 558 001	R 34 077 335	R 42 596 669	R 127 790 006
Total	**R / annum**			**R 9 205 334**	**R 18 410 668**	**R 27 616 001**	**R 36 821 335**	**R 46 026 669**	**R 138 080 006**

Payback period - years **3.1**

WC/WDM Projection summary and targets

Municipality name	Makhado

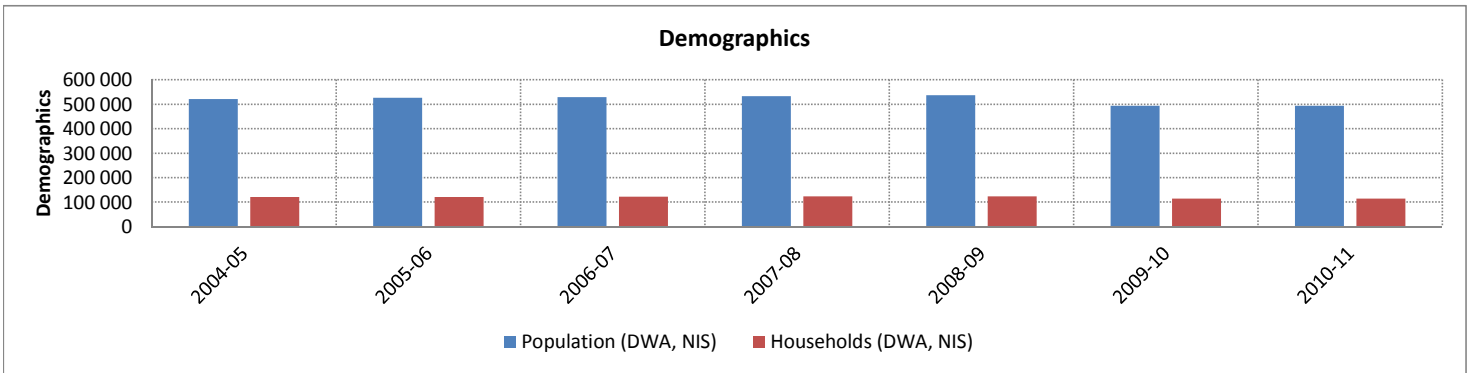
Water Demand projection	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Less 1.0% WDM Scenario							19.57	19.73	19.89	20.06	20.23	20.39
Less 3.0% WDM Scenario							19.50	19.60	19.69	19.79	19.89	19.98
Less 5.0% WDM Scenario							19.44	19.47	19.49	19.52	19.55	19.57
Actual Demand	3.76	4.37	4.47	0.00	0.00	0.00	0.00	19.60				
High population No WDM							19.60	19.80	19.99	20.19	20.40	20.60
Current yield	19.60	19.60	19.60	19.60	19.60	19.60	19.60	19.60	19.60	19.60	19.60	19.60

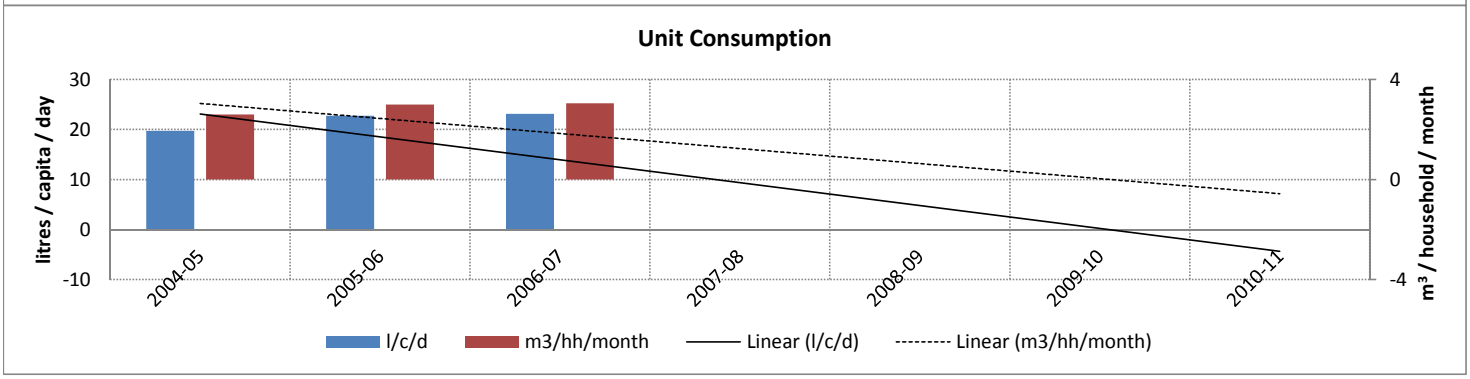
Savings	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Less 1.0% WDM Scenario							0.03	0.07	0.10	0.13	0.17	0.21
Less 3.0% WDM Scenario							0.10	0.20	0.30	0.40	0.51	0.62
Less 5.0% WDM Scenario							0.16	0.33	0.50	0.67	0.85	1.03
Actual savings							19.60					

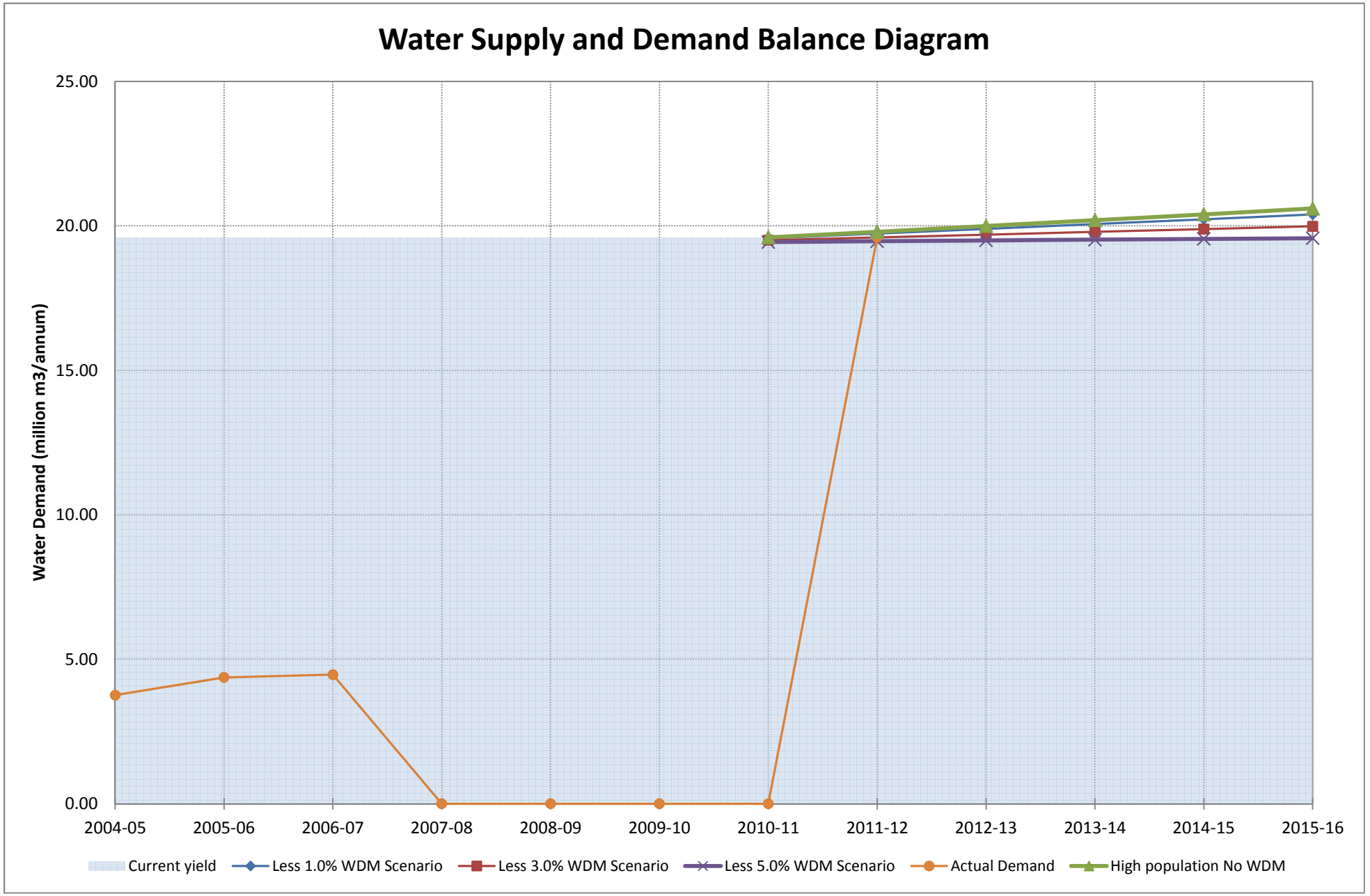
% Reduction	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Less 1.0% WDM Scenario							0.17%	0.33%	0.50%	0.67%	0.83%	1.00%
Less 3.0% WDM Scenario							0.50%	1.00%	1.50%	2.00%	2.50%	3.00%
Less 5.0% WDM Scenario							0.83%	1.67%	2.50%	3.33%	4.17%	5.00%

Year / Year % Growth	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Less 1.0% WDM Scenario								0.8%	0.8%	0.8%	1.7%	1.7%
Less 3.0% WDM Scenario								0.5%	0.5%	0.5%	1.0%	1.0%
Less 5.0% WDM Scenario								0.2%	0.1%	0.1%	0.3%	0.3%
Actual Demand		16.3%	2.2%	-100.0%	#DIV/0!	#DIV/0!	#DIV/0!					
High population No WDM								1.0%	1.0%	1.0%	1.0%	1.0%

Key Performance Indicators	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Population (DWA, NIS)	521 641	526 127	529 281	533 242	536 438	494 267	494 268					
Households (DWA, NIS)	120 409	121 456	122 181	123 099	123 836	114 092	114 093					
l/c/d	20	23	23	0	0	0	0					
m3/hh/month	3	3	3	0	0	0	0					
Demand Ml/day	10	12	12	0	0	0	0					






Water Supply and Demand Balance Diagram
Water Demand (million m3/annum)
25.00
20.00
15.00
10.00
5.00
0.00
2004-05
2005-06
2006-07
2007-08
2008-09
2009-10
2010-11
2011-12
2012-13
2013-14
2014-15
2015-16
Current yield
Less 1.0% WDM Scenario
Less 3.0% WDM Scenario
Less 5.0% WDM Scenario
Actual Demand
High population No WDM

WCWDM STRATEGY : RPMS Compliance

Municipality name	Makhado

Key questions from the Regulatory Performance Measurement System (RPMS) related to WC/WDM

KPI		ID	WSA Value
KPI 1 – Access to Water			
KPI 2 – Access to Sanitation			
KPI 3 – Access to Free Basic Water			
	Total poor households receiving Free Basic Water for last financial year	ID:012	
	Total poor households	ID:013	
KPI 4 – Access to Free Basic Sanitation			
	Total poor households receiving Free Basic Sanitation for last financial year	ID:014	
	Total poor households	ID:013	
KPI 5 – Drinking Water Quality			
KPI 6 –Wastewater Quality			
KPI 7 - Customer Services Standards			
Component 1 – Service Interruptions			
	Total number of Service interruptions in the last financial year	ID:034	
	Number of interruptions in continuous service to consumers, where interruption for a single incident was greater than 24h	ID:033	
Component 2 – CRM Systems			
	Does the WSA have a customer Charter	ID:036	
	Does the WSA have a customer service centre	ID:035	
	Is there a system to manage customer queries and log faults	ID:038	
	Does the incident tracking system escalate complaints if not responded to within a prescribed time?	ID:037	
KPI 8 - Institutional Effectiveness			
Component 1 - Institutional Effectiveness			
	Completed WSDP is approved by Council for the last financial year?	ID:039	
	Required policies are in place and approved by Council?	ID:040	
	Required bylaws are in place and approved by Council?	ID:041	
	Contracts and Service level agreements in place with all appropriate service delivery role-players (WSPs, internal etc.)	ID:042	
	The WSA monitors the KPIs defined by the contract or SLA?	ID:043	
Component 2 - Water Services Staff Effectiveness			
	Total Water Services staff costs for the last financial year	ID:045	
	Total cost of water and sanitation provision for the last financial year including interest and depreciation (expenditure)	ID:046	
	Total budgeted for water services staff according to the approved organogram for the last financial year	ID:078	
Component 3 - Grant Funding Effectiveness			
	Total grant funding allocation received for the last financial year	ID:048	
	Total grant funding allocation spent for the last financial year	ID:047	
Component 4 - WSA Annual Report			
	WSA annual report submitted to Minister	ID:077	
Component 5 - % Filled Posts on Organogram			
	Total number of posts on Council-approved organogram for the last financial year for water services staff	ID:080	
	Total number of posts filled on the approved water services organogram in the last financial year	ID:079	

KPI 9 - Financial Performance			
Component 1 – Financial Integrity			
	Is WSA ring-fenced? (Separate legal entity=3, Separate accounting entity=2, Partially ring-fenced=1, Not ring-fenced at all=0)	ID:049	
	Audit report evaluation. (Unqualified=4, Qualified=3, Adverse=2, Disclaimer=1, No report=0)	ID:050	
Component 2 – Average Debtor Days			
	Water Services sales income for the last financial year (water/sanitation)	ID:052	
	Total outstanding customer/consumer debt for water and sanitation for the last financial year	ID:051	
Component 3 – Revenue Collection Effectiveness			
	Water Services sales income for the last financial year (water/sanitation)	ID:052	
	Water Services billed income actually received from consumers for last financial year	ID:053	
Component 4 – Average Creditor Days			
	Total bulk water purchases for the last financial year	ID:055	
	Total bulk water accounts outstanding for the last financial year	ID:054	
Component 5 – Financial Sustainability			
	Total water and sanitation income for the last financial year	ID:056	
	Total cost of water and sanitation provision for the last financial year including interest and depreciation (expenditure)	ID:046	
Component 6 – Financial Effectiveness			
	Total outstanding customer/consumer debt (after provisions) for water and sanitation for the last financial year	ID:051	
	Total provision for doubtful debt for water and sanitation for the last financial year	ID:082	
KPI 10 Strategic Asset Management			
Component 1 - Capital Spent on Rehabilitation and Replacement			
	Total capital budget (Water and Sanitation) in the last financial year	ID:063	
	Total capital spent on refurbishment and replacement in the last financial year	ID:062	
Component 2 –Asset Management Effectiveness			
	Asset management plan status	ID:057	
	Asset register status	ID:058	
	Asset management system is electronic	ID:059	
Component 3 – O&M Expenditure			
	Total spent on O&M/Annual maintenance cost (Water and Sanitation) in the last financial year	ID:060	
	Replacement value of assets (water services infrastructure)	ID:061	
Component 4 – Replacement Saving			
	Depreciation value for the last financial year (Water and Sanitation infrastructure)	ID:065	
	Contribution to asset replacement fund for the last financial year. (Water and Sanitation)	ID:064	
Component 5 – Asset Register Monitoring			
	Asset register field monitored: Date acquired	ID:066	
	Asset register field monitored: Estimated remaining life of asset	ID:068	
	Asset register field monitored: Replacement value of asset	ID:070	
	Asset register field monitored: Purchase cost of asset	ID:069	
	Asset register field monitored: Description of asset (Yes/No)	ID:067	
KPI 11 Water Demand Management			
	System input volume (external sources) for the last financial year	ID:121	
	System input volume (own sources) for the last financial year	ID:122	
	Total billed metered water consumption (volume) for the last financial year	ID:071	
	Total billed unmetered water consumption (volume) for the last financial year	ID:074	
	Total unbilled metered water consumption (volume) for the last financial year	ID: 073	
	Total unbilled unmetered water consumption (volume) for the last financial year	ID: 123	
ADDITIONAL QUESTIONS FOR WATER USE EFFICIENCY			

	Water Conservation and Water Demand Management plan		
	Installation of water efficient devices		
	Repair of leaks		
	Measurement or control of water supplied		
	Pressure management		
Additional KPI : Tariff Data			
	Which of the listed elements are taken into account when you determine your tariff? Indicate from the list provided	ID: 201	
	Total amount of subsidies allocated to water for the next financial year	ID: 202	
	Total projected cost of water provision for the next financial year	ID: 203	
	Does your tariff recognise the difference between levels of service (according to Regulation 4 under s10 of the Water Services Act)?	ID: 204	
	Does your tariff recognise the difference between socio-economic status of customers (according to s10 of the Water Services Act)?	ID: 205	
	Do you charge a rising block tariff?	ID: 206	
	How many blocks are in your tariff structure?	ID: 207	
	What is your approved standard tariff? (Basic levy)	ID: 208	
	What are the actual 2010/2011 tariffs for the following consumer categories?	ID: 209	
	Do you reflect your tariff structure on your bill?	ID: 210	
	What are the quantities of water supplied to the following consumer categories (annually)?	ID: 211	
	What is the unit number of consumers served with water in each consumer category?	ID: 212	
	Do you have a seasonal tariff in your WSA?	ID: 213	
	Does your tariff include a fixed charge?	ID: 214	
	If a fixed charge is levied, do you subsidise the FBW?	ID: 215	
	What other sources of water services revenue (other than tariffs) does your WSA have? Indicate sources on the list provided	ID: 216	
	Total annual water services surplus / deficit	ID: 217	

water affairs

Department:
Water Affairs
REPUBLIC OF SOUTH AFRICA

Department of Water Affairs

Water Demand Management Strategy and Business Plan

for Musina Local Municipality

May 2013

WCWDM STRATEGY AND BUSINESS PLAN: Signature Page

Title :	**Development of a Water Conservation and Water Demand Management Strategy and Business Plan for Musina Local Municipality**			
Authors :	**WA Wegelin, Z Siqalaba, N Zondo**			
Study Name:	**Development of a First Order Water Conservation and Water Demand Management Strategy and Business Plan for Various Municipalities under the DWA Levuvhu Letaba Programme : Limpopo Province**			
Status of Report :				
Consultants :	**WRP Consulting Engineers (Pty) Ltd**			
Approved for Consultants :	Study leader	WA Wegelin, PrEng		
	Position	**Name**	**Signature**	**Date**
Municipality	**Musina**			
Approved for municipality :	Municipal Manager			
	Position	**Name**	**Signature**	**Date**
Department of Water Affairs	**Limpopo Region**			
Approved for Regional Office :				
	Position	**Name**	**Signature**	**Date**
Department of Water Affairs	**Head Office**			
Approved for Head Office				
	Position	**Name**	**Signature**	**Date**

WCWDM STRATEGY AND BUSINESS PLAN: Contact details

Province	**Limpopo**		**No**
Municipal Code	**LIM341**		**B3**
District Municipality	**Vhembe**		
Municipality	**Musina**		
Settlements	**Beitbridge, Bridgewater, Brombeek, Evangalina, Huntleigh, Mopane, Musina, Tshipise**		

Information provided by			
Date			
Contact person	Moufhe Matshili		
Position	Manager (Water Services)		
Telephone	015 534 6100	079 693 3328	
E-mail	msnawater@limpopo.co.za		
Study team contact			
Company	WRP Consulting Engineers		
Address	PO Box 1522, Brooklyn Square, 0075		
Contact person	Mr Willem Wegelin		
Telephone number	012 346 3496	**Cell number**	083 4477 999
E-mail	willemw@wrp.co.za		

Water Affairs contact			
Directorate	Water Use Efficiency		
Address	Private Bag X313, Pretoria, 0001		
Contact person	Koena Given Moabelo		
Telephone number	012 336 8174	**Cell number**	082 653 9216
E-mail	MoabeloK@dwa.gov.za		

Water Balance Data Confidence Level (see legend below)	
Input volume	Estimated values
Authorised consumption (Engineering functions)	Estimated values
Meter reading and billing (Finance functions)	Estimated values
Legend	
High level of accuracy	Calibrated bulk meters, >98% of consumers are metered < 10 years old, <2% billing complaints
Medium level of accuracy	Functional bulk meters, >90% of consumers are metered, <10% billing complaints
Low level of accuracy	Some functional bulk meters, >50% consumer meters, any age, meter reading & billing dysfunctional
Estimated values	No bulk or consumer meter readings, best estimate of water consumption
No data	No data and no idea of water consumption

WCWDM STRATEGY AND BUSINESS PLAN: Executive Summary

Province	Limpopo	**WSA**	No
Municipal Code	LIM341	**Category**	B3
District Municipality	Vhembe		
Municipality	Musina		
Settlements	Beitbridge, Bridgewater, Brombeek, Evangalina, Huntleigh, Mopane, Musina, Tshipise		

Executive summary

Status quo

Very limited WCWDM activities are undertaken in the WSA and there is little management information available to perform a proper assessment of the water losses and potential savings. This assessment is inline with the RPMS, Blue Drop assessments, IDP and WSDP.
Most of the towns are informal with formal infrastructure in a relatively smaller area within the LM which enables limited metering, billing and cost recovery in the WSA. The current metering, billing and cost recovery systems are adequate however improvements can be made in the capturing and tracking of monthly management information.
The engineering department in the Local Municipality is characterised by high vacancies and low capacity and skills.
The current estimated unit consumption of 262 l/c/d is high and provides good scope for significant reduction but a more detailed analysis is required to verify this number. It seems there has been a drastic decrease in the average unit consumption in the area. The relationship with the community is generally positive and the communities themselves are characterised by high unemployment and a large indigent population. The water tariffs are not promoting WCWDM, are not cost reflective and consumers do not value water supply.

Strategy

The municipality should focus on proper record keeping, analysis and development of detailed management information. All vacancies must be filled as a matter of priority together with skills transfer and capacity building. The engineering and finance department must work closer together at the LM and DM level to improve metering, billing and cost recovery and start with a meter audit to further improve cost recovery.
A steering committee should be setup to report on a monthly basis to council on water loss figures, leaks repaired, targets, progress, consumer metering, billing and cost recovery.
Proper metering, billing and cost recovery should be supported by community awareness that promotes reporting of leaks, fixing of private leaks and efficient use. Based on the available information, a target reduction in NRW of 22.8% down to 14.2% and target input volume reduction of 8.6% have been set. Review the water tariff structure to ensure it reflects true cost, promote WCWDM and work towards compliance with RPMS and improve IDP.

Business Plan

The budget requirements for the next five years are summarised in the table below:

Intervention	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Institutional	375 000	175 000	375 000	175 000	175 000	1 275 000
Financial	3 324 660	3 224 660	3 224 660	3 124 660	3 124 660	16 023 300
Social	1 553 052	1 353 052	1 353 052	1 353 052	1 353 052	6 965 260
Technical	6 113 272	5 913 272	5 438 272	5 438 272	5 428 272	28 331 360
Total	**11 365 984**	**10 665 984**	**10 390 984**	**10 090 984**	**10 080 984**	**52 594 920**

Compliance

Results from the Regulatory Performance Measurement System (RPMS)

Key Performance Indicators	Achieved KPI Score	Required score	Performance assessment
KPI 1: Access to water supply [Overall KPI compliance score]	1.87	3.00	Concern
KPI 2: Access to sanitation [Overall KPI compliance score]	3.11	3.00	Adequate
KPI 3: Access to Free Basic Water [Overall KPI compliance score]	5.00	3.00	Excellent
KPI 4: Access to Free Basic Sanitation [Overall KPI compliance score]	0.00	3.00	Crisis
KPI 5: Drinking Water Quality management [Overall KPI compliance score]	1.00	3.00	Crisis
KPI 6: Wastewater quality management [Overall KPI compliance score]	0.00	3.00	Crisis
KPI 7: Customer service quality [Overall KPI compliance score]	3.50	3.00	Good
KPI 8: Institutional effectiveness [Overall KPI compliance score]	3.28	3.50	Concern
KPI 9: Financial performance [Overall KPI compliance score]	0.57	4.00	Crisis
KPI 10: Strategic asset management [Overall KPI compliance score]	3.38	3.00	Good
KPI 11: Water use efficiency [Overall KPI compliance score]	0.00	3.00	Crisis

Results from Blue and Green Drop Assessments

Assessment	Year	Microbiological	Chemical	Physical & Organoleptic	Operational	Total
Blue drop	2012	96.96%	99.90%	0.00%	0.00%	76.95%
Green drop	2010	0.00%	0.00%	0.00%	0.00%	0.00%

WCWDM STRATEGY AND BUSINESS PLAN: Municipal Water Conservation and Water Demand Management Implementation Process Map

Strategy and Planning Phase

Performed by WCWDM Strategy Steering Committee (MEC, Municipal Manager, Technical and Financial Directors)
Reviewed by SSC and DWA

Implementation

Performed by Department
Reviewed by SSC and DWA

Monitoring and Review

Performed by Department
Reviewed by SSC and DWA

Vision

Water Services Act, 108 of 1997

Provide water services in an efficient, affordable, equitable, economical and sustainable manner to all consumers or potential consumers in its area of jurisdiction.

BIG HAIRY AND AUDACIOUS VISION
If it doesn't scare you, its not big enough

Mission

Presidential Target
(State of the Nation address 2010)

Reduce water Losses by half by 2014

Status Quo

Technical

Information on demographics, demands, water loss, level of service

Key water loss contributing factors

Key performance indicators and targets

Asset value and condition

Departmental organogram

Economic

Tariffs

Metering, billing and revenue collection status

Existing sources of funding

Social

Customer profile

Communication dynamics between WSA and consumers

Existing support structures for consumers

Level of stakeholder involvement

Institutional

Existence of approved policies

Existence of approved bylaws

Regulatory compliance

Legislative compliance

Strategy

Technical

SWOT Analysis : Strengths, **W**eaknesses, **Opportunities** & **T**hreats of technical department (human resources, processes,
Goals and objectives: Achieving water loss reduction target in terms of available resources and non-revenue water. If no target exists, then goal is to develop a target.
How : Identify key principles to achieve target (user pay, water restrictions, consumer education, etc.)
Actions : Responsible person, measurement and timelines to address SWOT analysis

Economic

SWOT Analysis : Strengths, **W**eaknesses, **Opportunities** and **T**hreats of funding sources
Goals and objectives: Allocate sufficient funding to address WCWDM
How : Identify key principles to obtain funding (improved metering and billing, cost recovery, external funding, etc.)
Actions : Responsible person, measurement and timelines to address SWOT analysis

Social

SWOT Analysis : Strengths, **W**eaknesses, **Opportunities** and **T**hreats of consumers and institution
Goals and objectives: Informed and supportive consumer and institution
How : Identify key principles to develop turn consumers into customers (political, schools, specific consumer groups, water wise, etc.)
Actions : Responsible person, measurements and timelines to address SWOT analysis

Institutional

SWOT Analysis : Strengths, **W**eaknesses, **Opportunities** and **T**hreats of policies, bylaws, political support , enforcement, Regulatory compliance
Goals and objectives: Reform organisation to support WCWDM
How : Identify key principles to obtain improve (improved political support, policies, enforcement, etc.)
Actions : Responsible person, measurement and

Business Plan

Technical

Bulk metering
Leakage control and repair
Sectorisation and zone metering
Logging and water loss monitoring
Non domestic and domestic metering and audits
Resolve intermittent supply
Pressure management
Clean out and recommission existing infrastructure
Training and capacity building

Economic

Review tariff structure
Ensure effective metering and billing system
Review CAPEX budget in terms of WDM goals
Review OPEX budget in terms of WDM goals
Develop business plan for external funding
Training and capacity building

Social

Raise awareness at political levels
Raise awareness at institutional levels
Identify and engage relevant stakeholders
Establish customer care centre
Training and capacity building
Conduct WC/WDM education and awareness
Conduct schools awareness campaigns

Institutional

Establish policies in terms of payment for services, arrears,
Establish bylaws that addresses water loss reduction and efficiency
Succession planning - ensure initiatives continue

Implementation

All Projects

Council approval of Strategy and Business Plan

Identify key stakeholders - setup working committees

Appoint PSP

Appoint contractor

Assess / determine baseline

Implement interventions

Project Quality Control

Project Financial Management

Establish record keeping and reporting processes

Assess benefits from implementation

Establish take-over procedure

Training and capacity building

Deliverables

Technical

Record keeping and reporting process
Monthly IWA Water Balance calculation for system and DMA
No visible leakage
Asset management
Comply with Regulations R509 of 2001
Responsible WCWDM individual/unit

Measurement against goals

Economic

Sufficient budget allocation
Realistic tariff setting
Efficient meter reading, billing and cost recovery process

Measurement against goals

Social

Political support
Institutional support
Informed, involved and supportive consumer

Measurement against goals

Institutional

Approved policies
Approved bylaws
Policy and bylaws enforcement
Regulatory compliance
Succession plan

Measurement aga[illegible]als

Deliverables

Review and update strategy and business plan . Implement and regulate.

Detailed management information

DWA Planning and target setting, Review strategies and Business Plans and align with targets, Possible funding, Technical and Institutional Support, Develop generic Policies and bylaws, Develop Regulations and Regulate, Report to Precedency

WCWDM STRATEGY : Definitions

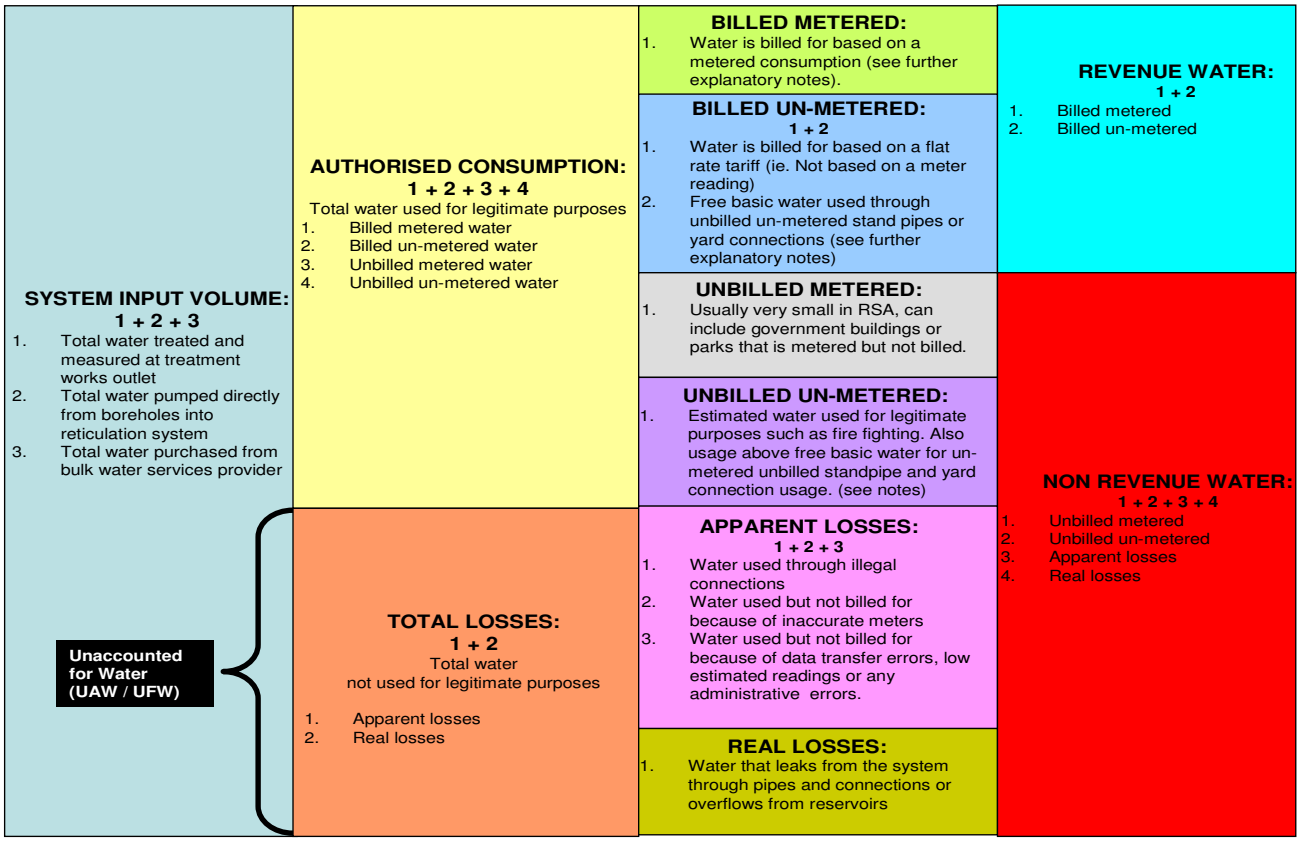
Terminology

Acronym	Description	Link
DWA	Department of Water Affairs	http://www.dwa.gov.za
WS RPMS	Water Services : Regulatory Performance Measurement System	http://www.dwa.gov.za/dir_ws/rpm/
WS NIS	Water Services : National Information System	http://www.dwa.gov.za/dir_ws/wsnis/
FBS	Water Services : Free Basic Water Project	http://www.dwaf.gov.za/dir_ws/fbw/
NRW	Non-revenue water. Volume of water for which no revenue is received (preferred term)	
UAW or UFW	Unaccounted-for water. Volume of water lost due to physical and apparent losses (not preferred term)	
StatsSA NFC	Statistics South Africa : Non-Financial Census of Municipalities P9115	http://www.statssa.gov.za/

Information sources

Item	Source	Calculation
Population	DWA WS NIS or municipality	
Households	DWA WS NIS or municipality	
Connections - metered	Extrapolated 2007 DWA - WS FBW serviced above RDP or municipality	
Connections - Unmetered	Extrapolated 2007 DWA - WS FBW serviced at RDP or municipality	
Length of mains (km)	Actual value or calculated at average of 50 connections / km of mains	# connections ÷ 50
(A) System input volume	Total volume of potable water supplied by the municipality in kl/annum	
(B) Billed metered consumption	Total volume of water metered and billed by the municipality in kl/annum	
(C) Billed unmetered consumption	Total volume of water unmetered and billed by the municipality in kl/annum	
Underlined values	Calculated values using trends or averages	

Standard IWA Water Balance



Apparent Losses

Illegal connections	%	Water Quality	Meter age and accuracy	%	Data transfer	%
Very high	10%	Very poor	> 10 years	10%	Very poor	9%
High	8%	Poor		8%	Poor	7%
Average	6%	Average	5- 10 years	6%	Average	5%
Low	4%	Good		4%	Good	3%
Very low	2%	Very good	< 5 years	2%	Very good	1%

WCWDM STRATEGY : Base Information

Municipality name	Musina			Date of current data	2012
			Current	Target	Change
Input Data	Demographics	IDP Ref			
	Population	**Par 2.4**	**No**	**51 892**	**51 892**	**0**
	Urban		No			
	Rural		No	51 892	51 892	
	Households	**Par 2.4**	**No**	**12 525**	**12 525**	**0**
	Urban		No			
	Rural		No	12 525	12 525	
	Household density		**Pop / HH**	**4.70**	**4.14**	
	Growth rate: 5 years	**Par 4.1.3**	**%**	**4.0%**	**4.0%**	**0**
	Consumer units	**Par 3.3**	**No**	**49**	**49**	**0**
	Residential		No		0	
	Police stations		No	3	3	
	Magistrates Offices		No	1	1	
	Business		No		0	
	Dry industries		No		0	
	Office buildings		No		0	
	Prisons		No		0	
	Schools		No	38	38	
	Health facilities		No	7	7	
	Wet industries		No		0	
	Mining		No		0	
	Resorts and tourism		No		0	
	Infrastructure					
	Water Level of Service	**Par 3.1**	**no**	**9 651**	**9 651**	**0**
	Stand pipes		HH	1 837	1 837	0
	Yard connections		HH	7 814	7 814	
	House connections		HH	0	0	
	Length of mains (km)	**Par 5.1.2**	**km**	**267.0**	**267.0**	**0**
	Connections / km of mains		**No / km**	**36.1**	**36.1**	
	Average system pressure		**m**	**40**	**30**	**-10**
	Time pressurised		**%**	**90%**	**100%**	**0**
	Sanitation Level of Service	**Par 3.2**		**9 535**	**9 535**	**0**
	None water borne		No	1 721	1 721	
	Water borne low flush		No	0	0	
	Septic tanks / conservancy		No	0	0	
	Water borne - WTW		No	7 814	7 814	
	Apparent losses		**%**	**17%**	**17%**	**0%**
	Consumer meter age		**%**	**6%**	**6%**	**0%**
	Illegal connections		**%**	**6%**	**6%**	**0%**
	Data transfer		**%**	**5%**	**5%**	**0%**
	Water balance data					
	System input volume		**kℓ/annum**	**4 958 299**	**4 462 469**	**-495 830**
	Own sources		**kℓ/annum**	**4 958 299**	**4 462 469**	**-495 830**
	Other sources		**kℓ/annum**			**0**
	Billed metered consumption		**kℓ/annum**	**3 709 640**	**3 709 640**	**0**
	Billed unmetered consumption		**kℓ/annum**	**120 058**	**120 058**	**0**
	Unbilled metered consumption		**kℓ/annum**			**0**
	Unbilled unmetered consumption		**kℓ/annum**			**0**
	Water Tariffs					
	Purchase of bulk water	**Par 10.2**	**R/annum**			**R 0.00**
	Total operating cost		**R/annum**			**R 0.00**
	Rate - Purchase of bulk water		**R/kℓ**	**#DIV/0!**	**#DIV/0!**	
	Rate - Total operating		**R/kℓ**	**R 0.00**	**R 0.00**	
	Domestic Water Tariffs	**Par 10.3**				
	0 to	**75**	**kℓ/month**	**R 5.04**	**R 5.04**	**R 0.00**
	to		**kℓ/month**		**R 0.00**	**R 0.00**
	to		**kℓ/month**		**R 0.00**	**R 0.00**
	to		**kℓ/month**		**R 0.00**	**R 0.00**

		to		kℓ/month		R 0.00	R 0.00
	>	to	75	kℓ/month	R 5.23	R 5.23	R 0.00

Water Balance Calculations	System input volume	kℓ/annum	4 958 299	4 462 469	-495 830
	Authorised Consumption	kℓ/annum	3 829 698	3 829 698	0
	Billed authorised	kℓ/annum	3 829 698	3 829 698	0
	Billed metered	kℓ/annum	3 709 640	3 709 640	0
	Billed unmetered	kℓ/annum	120 058	120 058	0
	Unbilled authorised	kℓ/annum	0	0	0
	Unbilled metered	kℓ/annum	0	0	0
	Unbilled unmetered	kℓ/annum	0	0	0
	Water losses	kℓ/annum	1 128 601	632 771	-495 830
	Apparent losses	kℓ/annum	191 862	107 571	0
	Real losses	kℓ/annum	936 739	525 200	-495 830
	UARL	kℓ/annum	164 602	137 168	0
	Potential real loss saving	kℓ/annum	772 137	388 032	-495 830
	Revenue water	kℓ/annum	3 829 698	3 829 698	0
	Non-Revenue water	kℓ/annum	1 128 601	632 771	-495 830

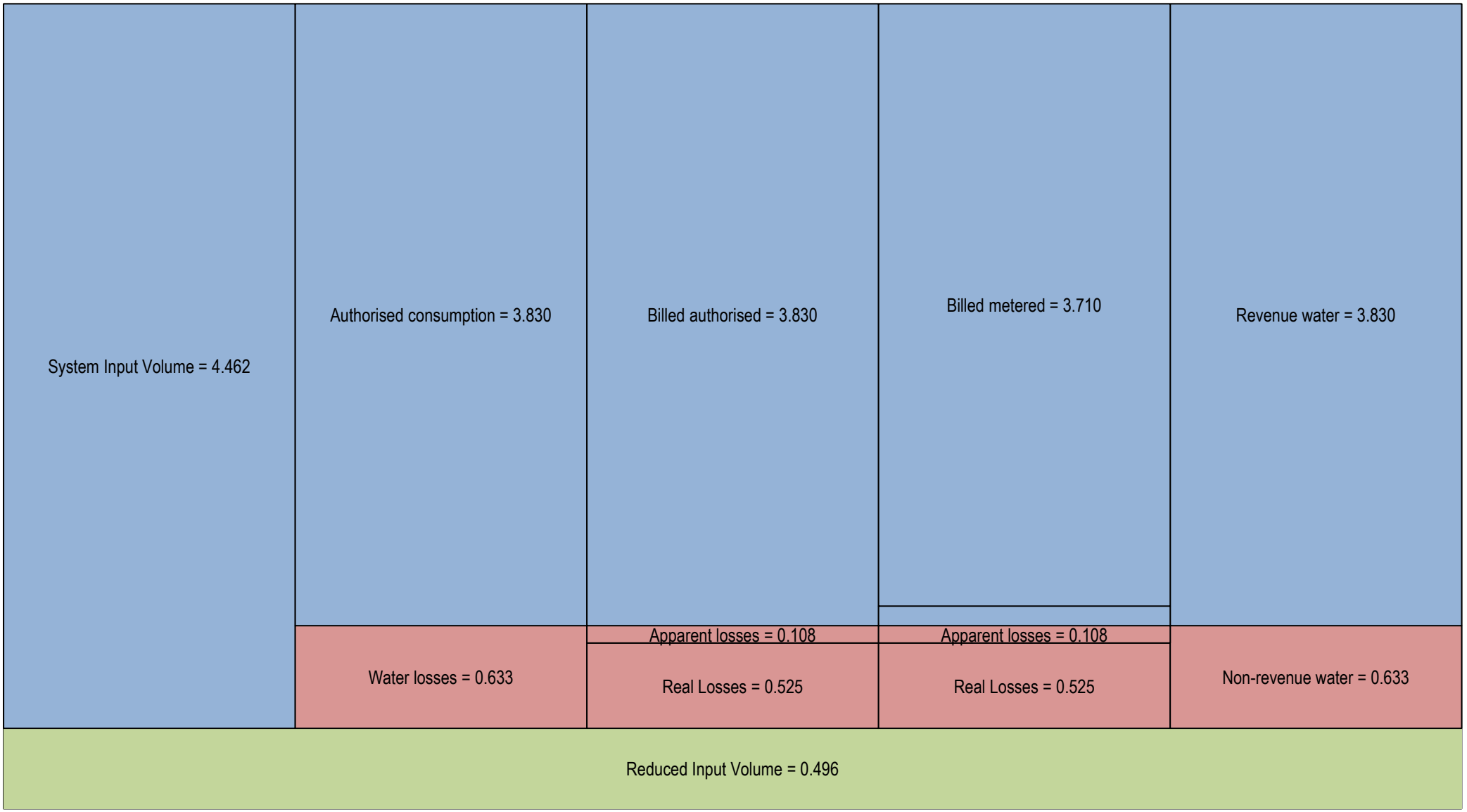
Key Performance Indicators	System input volume unit consumption				
	litres / capita / day	ℓ / c / d	262	236	-26
	m³ / household / month	m³ / hh / month	33	30	-3
	m³ / connection / month	m³ / conn / month	43	39	-4
	Authorised unit consumption				
	litres / capita / day	ℓ / c / d	202	202	0
	m³ / household / month	m³ / hh / month	25	25	0
	m³ / connection / month	m³ / conn / month	33	33	0
	Water loss indicators				
	UARL : Losses / connection / day	ℓ / conn / day	47	39	-8
	CARL : Losses / connection / day	ℓ / conn / day	266	149	-117
	Infrastructure Leakage Index (ILI)	-	5.69	3.83	-2
	Losses / km mains / day	m³ / km / day	9.6	5.4	-4
	Non-revenue water	%	22.8%	14.2%	-8.6%
	Unbilled Consumption	%	0.0%	0.0%	0.0%
	Water Losses	%	22.8%	14.2%	-8.6%
	Apparent losses	%	3.9%	2.4%	-1.5%
	Real losses	%	18.9%	11.8%	-7.1%
	Water balance reduction targets				
	System input volume	%		-10.0%	
	Authorised Consumption	%		0.0%	
	Billed authorised	%		0.0%	
	Billed metered	%		0.0%	
	Billed unmetered	%		0.0%	
	Unbilled authorised	%		0.0%	
	Unbilled metered	%		0.0%	
	Unbilled unmetered	%		0.0%	

Cost Analysis	Average monthly water bill / connection	R / conn / month	R 166	R 166	R 0
	Estimated annual income	R / annum	R 19 261 852	R 19 261 852	R 0
	Total water supply cost	R / annum	R 0	R 0	R 0
	Net profit / loss	R / annum	R 19 261 852	R 19 261 852	R 0

Water Source and Treatment Capacity	Town and description	Source	Ml/day	m³/annum	million m³/annum
	Musina LM	NRW data	12.00	4 380 000	4.380
				0	0.000
				0	0.000
				0	0.000
	Total		12.00	4 380 000	4.380

Current IWA Water Balance Diagram (million m^3/annum)

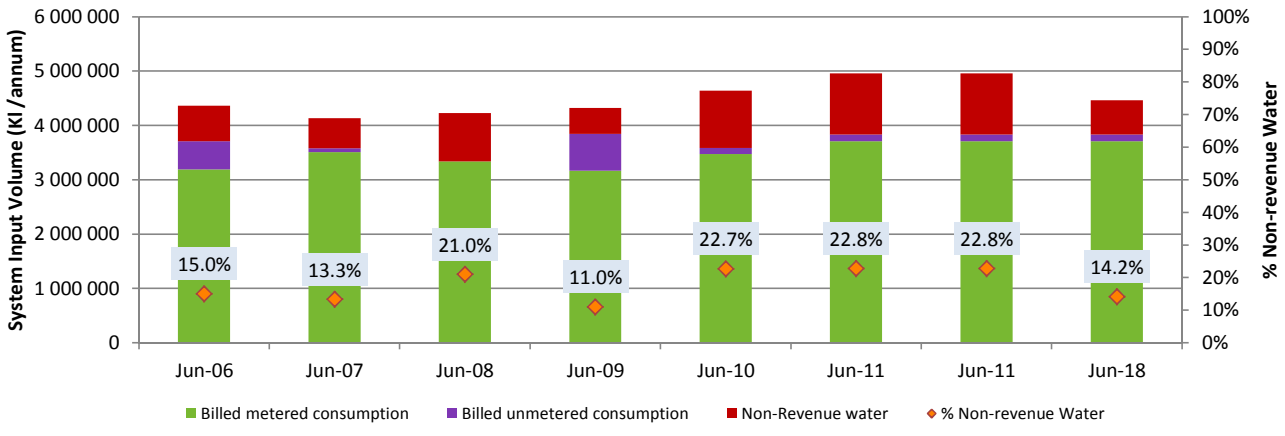
Target IWA Water Balance Diagram (million m^3/annum)



WCWDM STRATEGY : Water Balance History

Municipality Name	Musina

	Year ending		Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	Jun-11	Jun-11	Jun-18
Input Data	Population		41 745	41 997	42 314	42 568	43 003	45 583	51 892	73 610
	Households		12 901	12 977	13 076	13 153	13 287	14 084	12 525	17 767
	Connections - metered		10 662	10 726	10 807	10 872	10 983	11 642	12 340	17 505
	Connections - Unmetered		2 316	2 329	2 347	2 361	2 385	2 528	2 680	3 801
	Length of mains (km)		236	238	240	241	244	258	274	388
	System input volume	kl/annum	4 361 429	4 131 216	4 225 538	4 319 860	4 639 080	4 958 299	4 958 299	4 462 469
	Billed metered consumption	kl/annum	3 187 681	3 508 846	3 338 764	3 168 682	3 472 764	3 709 640	3 709 640	3 709 640
	Billed unmetered consumption	kl/annum	518 976	71 539		675 231	111 907	120 058	120 058	120 058
	Unbilled metered consumption	kl/annum								
	Unbilled unmetered consumption	kl/annum								
Water Balance Calculations	Revenue water	kl/annum	3 706 657	3 580 385	3 338 764	3 843 913	3 584 671	3 829 698	3 829 698	3 829 698
	Non-Revenue water	kl/annum	654 772	550 831	886 774	475 947	1 054 409	1 128 601	1 128 601	632 771
	Water Losses	kl/annum	654 772	550 831	886 774	475 947	1 054 409	1 128 601	1 128 601	632 771
	% Non-revenue water		15.0%	13.3%	21.0%	11.0%	22.7%	22.8%	22.8%	14.2%
	% Water Losses		15.0%	13.3%	21.0%	11.0%	22.7%	22.8%	22.8%	14.2%
Key performance indicators	Input : Litres / capita / day		286	270	274	278	296	298	262	166
	Input: m³ / household / month		28	27	27	27	29	29	33	21
	Billed : Litres / capita / day		243	234	216	247	228	230	202	143
	Billed : m³ / household / month		24	23	21	24	22	23	25	18
	% Population growth		0.86%	0.60%	0.75%	0.60%	1.02%	6.00%	13.84%	61.48%
	% Water demand growth		23.20%	-5.28%	2.28%	2.23%	7.39%	6.88%	0.00%	-10.00%
Source of information										



Comments

WCWDM STRATEGY : Qualitative Scorecard

Municipality Name	Musina

Introduction

The purpose of this section is to perform a qualitative evaluation of the municipality's water business. The objectives are as follows :

SWOT Analysis	External - Opportunities Positive external conditions which you don't control which you could take advantage of	External - Threats Negative conditions you don't control but could minimise their effects
Internal - Strengths Positive aspects under your control and on which you may wish to capitalise	Strengths and Opportunities (SO) – Strategies that use strengths to maximize opportunities.	Strengths and Threats (ST) – Strategies that use strengths to minimize threats.
Internal - Weaknesses Negative aspects under your control (to a large extent) which you could plan to improve	Weaknesses and Opportunities (WO) – Strategies that minimize weaknesses by taking advantage of opportunities.	Weaknesses and Threats (WT) – Strategies that minimize weaknesses and avoid threats.

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
1	**INSTITUTIONAL REVIEW**				
1.1	**Water and Sanitation department structure**				
1.1.1	Is there an approved organogram for the Water and Sanitation Department?	Yes.	O	Review the existing organogram and ensure that it incorporates WC/WDM personnel.	1
1.1.2	What is the vacancy rate in the department and is it a problem?	Approximately 20% mainly operational staff.	T	Advertise and fill the identified critical vacant posts. Engage with the Department of finance at the District Level to identify and explore possible funding options and budget requirements for the critical posts.	1
1.1.3	Does the department have the correct technical skills for the correct posts.	The water department is not correctly skilled. Most of the staff is old and difficult to train. The levels of literacy are low. The superintendents are not fully skilled and an operations manager is required. Prioritisation of operational staff is lacking. Many managerial positions are under acting status. People are afraid to make decisions.	T	Increase management, and O&M capacity through new human resources and support it with WC/WDM training.	1
1.1.4	Is training and capacity building being done?	No training and capacity building is taking place.	O	Institute a mandatory WC/WDM training programme for technical staff. Invest in team building and workshop sessions incorporating the councillors and municipal management to boost staff morale.	2

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
1.1.5	Are there sufficient support structures ito vehicles, equipment, materials etc.?	There is not enough material and vehicles.	T	Engage with the Department of Finance at the District level and allocate an adequate budget for the critical spares. Allocate a specific person who will be responsible for expediting equipment orders and managing quality control in terms of the procurement processes.	1
1.1.6	Does the municipality own any water loss control equipment such as loggers, listening sticks, etc.?	No water loss equipment.	O	It is recommended that loggers and simple leak detection equipment be purchased to improve water loss monitoring and management in the system.	3
1.2	**Municipal support**				
1.2.1	Describe the working relationship with other departments such finance, planning, housing etc.?	There are long periods in which the departments don't meet. The working relationship is fair but the frequency of meeting is not good enough.	T	Establish a NRW steering committee comprising representatives from the technical, communications and finance departments to improve communication and access to information.	1
1.2.2	Are the politicians supporting the department?	The politicians are very supportive. Some training is required on the water business.	O	Undertake a councillor WC/WDM induction programme to capitalise on the existing relationship and build a communication bridge between the municipality and the customers.	2
1.3	**Public Private Partnerships**				
1.3.1	Is there any major industrial or institutional role player in the area and is there co-operation?	Venesia mine and coal of Africa mine are potential partners.	O	Identify any other additional role players through the top consumer monitoring and conduct courtesy visits as a first phase of the programme. Establish a stakeholder forum if practicable and encourage the participation of the big industries in the forum.	2
1.3.2	If yes, what does the co-operation involve and can it be expanded?				
1.4	**Legislation and bylaws**				
1.4.1	Does the municipality have a customer service charter?	No.	O	Develop a customer service charter to ensure the customers are aware of the municipality's commitment and their responsibilities as consumers.	3
1.4.2	What is the status and age of the existing bylaws and do they address water loss management?	The municipality uses the District bylaws but the district bylaws are under review. The municipality should ideally have its own bylaws.	O	Develop appropriate bylaws specific to Musina Municipality and ensure that they address WC/WDM issues.	3
1.4.3	Are bylaws enforced and if not, why not?				
1.4.4	What is the status and age of Water Services Development Plan?				
2	**FINANCIAL REVIEW**				
2.1	**Financial Department**				

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
2.1.1	What is your opinion of the Finance Department's ability to perform metering and billing	The finance department competently carries out its mandate.	O	Improve communication and access to information between the technical and finance department through scheduled monthly team meetings in order to fully utilise this resource.	1
2.1.2	Is training and capacity building being done?				
2.1.3	What is the state of the municipal metering and billing system?	The billing system is effective and the billing is frequent and continuous.	S	Obtain billed metered consumption from the finance department on a monthly basis and monitor water sales.	1
2.1.4	What is your primary source of funding?	MIG funding and the district allocation.	T	Focus on improving cost recovery to reduce dependency on MIG funding.	2
2.2	**Tariffs**				
2.2.1	Who prepares the water tariffs and what is it based on?	Finance develops the tariffs with no input from technical.	T	Ensure that the technical department makes inputs into the tariff setting process to ensure that the tariffs are feasible for the municipality and the consumers.	1
2.2.2	What is the tariff structure and does it promote WCWDM?	The municipality currently uses a flat tariff structure.	T	Review the current tariff structure. Institute a rising block tariff sufficiently differentiated in cost at each level to promote WC/WDM with the highest tariff at least double the lowest tariff.	2
2.2.3	Is the water supplied considered affordable by the customers?	The customers complain that the tariff is too high which is currently in the region of R5/Kl.	T	Review the tariffs and ensure that they become affordable particularly for the efficient and low income water users.	1
2.3	**Meter Reading and Billing**				
2.3.1	Who performs the water meter readings, frequency and accuracy?	The municipality.	O	Monitor the frequency of meter reading and customer complaints of inaccurate billing to determine the effectiveness of the existing meter reading contractor.	2
2.3.2	Are the meter readers trained and can they report leakage when encountered on site?	The meter readers do report leakage.	O	Providing training for the meter readers on an annual basis particularly on site training based on feedback from the consumers.	2
2.3.3	Is the water bill understandable and informative?	The bill is informative shows the previous months consumption. Some of the consumers don't understand the bill.	O	Consider including water conservation tips and information in the water bill. It is also recommended to display 6 months graphical consumption data on the bill to aid consumers in effectively monitoring water use.	3
2.4	**Credit control**				
2.4.1	Is credit control being implemented and by whom?	The Department of Finance is implementing credit control. They are very effective.	O	Capitalise on the relationship with the councillors and the community and ensure that the areas that re not yet metered are metered and billed to increase revenue water.	3
2.4.2	What is the current level of non-payment?	Levels of non payment are generally low.	O	Continue to promote payment for services in the metered areas through the councillors and education and awareness.	2
3	**SOCIAL REVIEW**				

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
3.1	**Customer profile**				
3.1.1	Describe the general consumer profile i.e. Income levels, indigence, unemployment, literacy	There are approximately 2409 indigent households in the municipality	O	Focus on educating the indigent population on efficient water use and the importance of the free basic allocation as well as its limitations.	1
3.1.2	Describe the relationship between customers and the municipality and reasons?	The consumers are generally satisfied with the water services so the relationship between the community and the municipality is largely positive in this regard.	O	The existing relationship should be improved on and utilised to increasingly promote water conservation and to support the cost recovery initiatives.	1
3.2	**Customer awareness**				
3.2.1	Are consumers informed regarding the value of water?	There has been community awareness done with the politicians on an adhoc basis. The consumers are generally not wasteful.	O	Continue to promote water efficiency. Utilise this positive community attribute and encourage the installation of water efficient devices and leak repair to further decrease water losses.	2
3.2.2	What is the level of leakage reporting by the community and what method do they use?	The levels of reporting are high and generally reporting is done in person.	O	Publicise the municipal leakage reporting number through the councillors, pamphlets attached to water bills and local media to promote reporting of leakage.	2
3.2.3	What are the most prominent consumer behavioural challenges encountered by the municipality?	The car washes are problematic as well as cable theft at the pump stations. Only one pump is operational at the moment out of the 2 existing pumps.	T	The community awareness campaign should be tailored to address these problems. The councillors should be encouraged to make these issues an agenda at all public meetings held in the different wards.	2
3.2.4	Is xeriscaped gardening and rain water harvesting encouraged?	No.	O	As part of a community awareness campaign, encourage consumers to harvest rain water and utilise it for garden irrigation and cleaning to reduce the demand for potable water.	2
3.2.5	Are radio campaigns, bill board, pamphlets, informative billing used to inform and educate customers?	Some education and awareness is conducted through the Musina radio station twice a month.	O	Develop simple visual material in the form of pamphlets which can be used to educate consumers on efficient water use. Build on the media campaign undertaken and periodically publicise water tips on local radio stations and newspapers.	2
3.3	**Schools awareness**				
3.3.1	Number of primary and secondary schools?	9 schools in town.	O	Establish a relationship with schools. Monitor their consumption on a monthly basis and undertake education and awareness. Huge benefit can be derived from this. The section 21 schools in particular should be visited, monitored and encouraged to fix leakage as the O&M budgets are operated by the school management for this category of schools.	2
3.3.2	Frequency and scope of schools awareness campaigns?	No schools awareness.	O	Establish a relationship with schools. Monitor their consumption and undertake education and awareness.	3

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
3.3.3	Are goals and objectives monitored and controlled?	No.			
3.4	**Customer Care Centre**				
3.4.1	Does the municipality have a CCC and who operates it?	No customer care section.	**O**	Obtained a trained individuals to receive and refer customer complaints and establish a customer care land line. Publicise the call centre and encourage the consumers to become the eyes and ears of the municipality and to report water and sanitation related problems.	**2**
3.4.2	How and to whom are billing queries referred?				
3.4.3	To whom are the leak reports referred and do consumers have confidence in the reporting system?	The billing and leakage reports go through switch board and are referred to the technical and billing department accordingly. The complaints are captured electronically by the service provider and submitted to Vhembe but the municipality does not have such a system.	**O**	Obtain an electronic system to capture and monitor the queries referred and to track the resolution of the queries.	**2**

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
4	**TECHNICAL REVIEW**				
4.1	**Measurement and control**				
4.1.1	Is the system input volume measured, monitored and controlled?	Weekly bulk meter readings are taken.	**S**	Continue to read the bulk meters to monitor input volumes. Record the readings on a spreadsheet for water balance purposes.	**1**
4.1.2	Is the water supply system sectorised into zones and districts?	Sectorisation has been done.	**S**	Monitor zone discreteness on an annual basis.	**1**
4.1.3	Are the supply to the zones and districts metered?	The zones are metered but the meters are not being read.	**S**	The zone meters must be read on a monthly basis and captured on a spread sheet. Ensure that operation of the boundary valves is well understood by all O&M personnel to ensure the zones are kept discrete and functioning properly.	**1**
4.1.4	Is the system monitored through a telemetry system?	There is an operational telemetry system which monitors the reservoirs.			
4.1.5	What is the Frequency and detail of your water balance calculation?				
4.1.6	Are minimum night flows, consumption trends and logging used to monitor the system?	No.	**O**	Obtain and install logging equipment periodically on the bulk meters once they have been installed and conduct MNF analysis to determine leakage levels and areas experiencing high or low pressures.	**3**
4.1.7	Are monthly management reports prepared and key performance indicators measured?	This is performed on a monthly basis. The report goes to the CFO, the Technical director and the technical director in VDM.	**O**	Continue to keep a monthly record of the water balance figures. Include all relevant key performance indicators and submit the records to DWA on a an annual basis.	**1**
4.2	**Physical leakage**				
4.2.1	What is the average age of the network, pipe material, replacement programme?	The network is not very old. Some of the areas are only 5-6 years old. The network in the town is old and mostly galvanised iron.	**T**	Set aside 5% of the CAPEX budget for the replacement of the network.	**1**
4.2.2	Number of burst pipes reported and repaired per week / month and the average response time?	Very few pipe bursts.	**S**	Continue to monitor the frequency of pipe bursts through the leak detection. Ensure that all pipe bursts are fixed within 48hrs.	**1**
4.2.3	What is the primary cause of burst pipes?	This happens on rare occasions and is usually accidental.			
4.2.4	Are active leak detection programmes conducted?	Yes it is taking place through the service provider. This is done on a continuous basis.	**O**	Undertake active leak detection on the network on an annual basis. Select appropriate areas for the leak detection exercise based on the district meter readings. This can be done through the meter readers.	**3**
4.2.5	How often and for how long do reservoirs overflow?	No overflows take place.	**S**	Continue to monitor the reservoirs on a monthly basis. Undertake an annual audit on the condition of the reservoirs.	**3**
4.2.6	Are water losses from treatment processes (backwash, etc.) monitored and minimised?	No.			

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
4.2.7	Is leakage on private properties a problem and if so, why?	Leaking internal fittings are a big problem and its mostly toilets.	T	Undertake an internal leak audit in critical areas to accurately determine the extent of water losses and do a cost benefit analysis to assess the merit of periodically performing leak repairs for indigent consumers.	1
4.2.8	Are leaks on indigent private properties repaired and removal of wasteful devices encouraged?	No. Internal leaks are fixed on a discretionary basis.	T	Review existing indigent policy and consider undertaking an internal leak audit and repair exercise for indigent and non paying consumers to drastically reduce the NRW.	1
4.3	**Pressure management and control valves**				
4.3.1	What is the average and maximum system pressure?	Uncertain.			
4.3.2	Is basic or advanced pressure management being implemented?	No pressure management is conducted.	O	Consider undertaking logging in areas experiencing high burst frequencies and monitor on a monthly basis. If the pressures are high for the area or exceed the regulations stipulated 9 bar, install pressure reducing valves to regulate the pressures more effectively.	2
4.3.3	Are control valves pro-actively being maintained to prevent overflowing reservoirs?	The control valves are proactively maintained and checked every day.	S	Undertake an annual control valve audit to assess the condition of the control valves and ensure that they are in proper working order.	2
4.4	**Consumer metering**				
4.4.1	Are domestic and non-domestic consumers metered and which type of meter is used?	There are 6789 metered connections in total.	O	Meter and bill 100% of non domestic connections as a priority and increasingly meter and bill the domestic consumers where practicable to increase revenue water.	1
4.4.2	What is the condition, age and accuracy of water meters?	The accuracy of the meter readings is very good. There are very few billing complaints and the verifications generally come back correct. The majority of the meters are less than 10 years. Most of the old meters are in town. Most of the meters are conventional meters. There are approximately 740 prepaid meters in the system.	O	Continue to budget and implement meter replacement programmes particularly for bulk and non domestic consumers.	1
4.4.3	Are the top consumers pro-actively monitored on a monthly basis?				
4.4.4	Describe the water quality and its impact on consumer water meters?	Thanda village has very bad water quality. The rest of the villages have class 2 water quality and the town has class 1 water quality.	W	Consider installing a water treatment package plant in selected areas with bad water quality to improve the services to those areas. Metering and billing can then be effected to recover the costs.	2
4.4.5	What is the prevalence and control of illegal connections?	Illegal connections are a big problem in the municipality especially in the farming community along the distribution main. There is one that is 75MM diameter connected onto the distribution main.	O	Actively monitor illegal connections and periodically undertake an audit on the meters. This can be conducted by the meter readers.	1
4.5	**Management information**				

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
4.5.1	Does the Municipality have an asset register and asset management programme?	There is a comprehensive asset register that sits with the VDM.	O	Review the asset register system in place. Maintain and update the asset register on an annual basis. Ensure that the asset register provides critical technical information such as the age, value and replacement date of the assets.	2
4.5.2	What is the status and age of as-built drawings?	The status of the as built drawings is uncertain however there are as built drawings for the water treatment works.	T	Develop electronic as built drawings for the whole network.	2

Summary

SWOT Analysis	Helpful	Harmful
Internal factors (Staff, infrastructure, tools, equipment)	Proactive maintenance of control valves The network is sectorised Weekly bulk meter readings are taken Zone metering has taken place Limited pipe bursts Comprehensive asset register Reservoirs monitored through a telemetry system Management reports are generated on a monthly basis	High vacancy rate particularly in operations and maintenance Limited materials to undertake operations and maintenance No training and capacity building Old dilapidated network Limited as built drawings
Internal factors (Politics, finance, consumers, economics)	Effective billing system Good credit control Positive relationship with the consumers Good political support Low levels of non payment	Illegal connections are a significant problem High levels of internal plumbing leakage No customer care section High dependence on MIG funding

WCWDM STRATEGY : Quantitative Scorecard

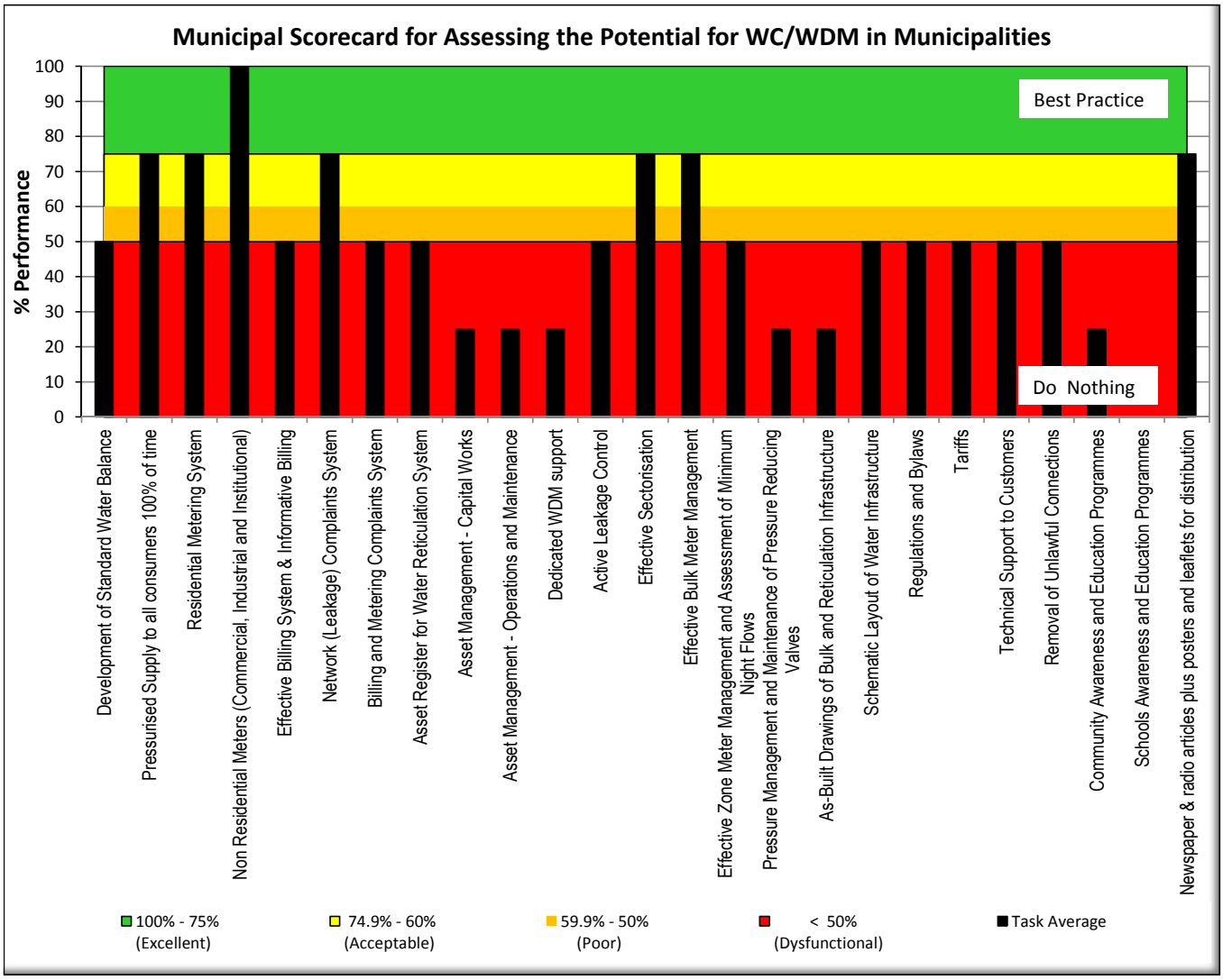
Municipality Name	Musina

Introduction

The purpose of the Water Conservation / Water Demand Management (WC/WDM) Scorecard is to ascertain the status quo of WC/WDM and evaluate the potential for WC/WDM measures to be implemented in these systems. The scorecard is aslo designed to enable the Regulator (Department of Water Affairs) to assess the current situation regarding losses and levels of wastage in all water supply systems countrywide. The scorecard consists of 25 multiple choice questions with each question getting scored from 0 to 4. The Regulator and WSA can track progress with each year the scorecard gets completed. Each question ends with an audit requirement which indicates what will be required by the Regulator should the questionnaire be audited. It also provides an indication on what is required in terms of each of the measures.

Completed by	PSP				
Date	Mar-12				Average
1. Development of Standard Water Balance	2				2
2. Pressurised supply to all consumers 100% of time	3				3
3. Residential Metering System	3				3
4. Non Residential Meters (Commercial, Industrial and Institutional)	4				4
5. Effective Billing System & Informative Billing	2				2
6. Network (Leakage) Complaints System	3				3
7. Billing and Metering Complaints System	2				2
8. Asset Register for Water Reticulation System	2				2
9. Asset Management - Capital Works	1				1
10. Asset Management - Operations and Maintenance	1				1
11. Dedicated WDM support	1				1
12. Active Leakage Control	2				2
13. Effective Sectorisation	3				3
14. Effective Bulk Meter Management	3				3
15. Effective Zone Meter Management and Night Flow Analysis	2				2
16. Pressure Management and Maintenance of Pressure Reducing Valves	1				1
17. As-Built Drawings of Bulk and Reticulation Infrastructure	1				1
18. Schematic Layout of Water Infrastructure	2				2

Date	Mar-12				Average
19. Regulations and Bylaws	2				2
20. Tariffs	2				2
21. Technical Support to Customers	2				2
22. Removal of Unlawful Connections	2				2
23. Community Awareness and Education Programmes	1				1
24. Schools Awareness and Education Programmes	0				0
25. Newspaper & radio articles plus posters and leaflets for distribution	3				3
Total score (maximum 100)			0	0	50



WCWDM STRATEGY AND BUSINESS PLAN : BUDGET AND CASHFLOW

Municipality name	Musina

COSTS

Item		Unit	Quantity / year	Rate	Year 1	Year 2	Year 3	Year 4	Year 5	Total
INSTITUTIONAL / LEGISLATIVE INTERVENTIONS										
Institutional review:					100%					100%
CAPEX	Review organogram and fill vacancies	Sum	1	R 200 000	R 200 000	R 0	R 0	R 0	R 0	R 200 000
OPEX		Sum			R 0	R 0	R 0	R 0	R 0	R 0
Training and education :					50%	50%				100%
CAPEX	Not applicable	No		R 0	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Assume one training course / employee / annum	No	15	R 5 000	R 75 000	R 75 000	R 75 000	R 75 000	R 75 000	R 375 000
Customer charter, policy, bylaws :							100%			100%
CAPEX	Review bylaws on 5 year cycles	Sum	1	R 200 000	R 0	R 0	R 200 000	R 0	R 0	R 200 000
OPEX	Enforce bylaws	Sum	1	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 500 000
FINANCIAL INTERVENTIONS										
Effective metering and billing :					50%	50%				100%
CAPEX	Perform meter audit	No		R 0	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Ensure proper metering and billing of all consumers	No	14 203	R 100	R 1 420 300	R 1 420 300	R 1 420 300	R 1 420 300	R 1 420 300	R 7 101 500
Water tariffs :					50%		50%			100%
CAPEX	Review water tariffs	Sum	1	R 200 000	R 100 000	R 0	R 100 000	R 0	R 0	R 200 000
OPEX	Not applicable	Sum		R 0	R 0	R 0	R 0	R 0	R 0	R 0
Informative billing :					50%	50%				100%
CAPEX	Improve invoice to show monthly consumption	Sum	1	R 200 000	R 100 000	R 100 000	R 0	R 0	R 0	R 200 000
OPEX	Distribute information with bill	Sum	14 203	R 120	R 1 704 360	R 1 704 360	R 1 704 360	R 1 704 360	R 1 704 360	R 8 521 800
SOCIAL INTERVENTIONS										
Consumer Awareness Campaign :					20%	20%	20%	20%	20%	100%
CAPEX	Install bill boards, design pamphlets, radio campaigns	Sum	14 203	R 120	R 340 872	R 340 872	R 340 872	R 340 872	R 340 872	R 1 704 360
OPEX	Target households on monthly basis with awareness cam	No	14 203	R 60	R 852 180	R 852 180	R 852 180	R 852 180	R 852 180	R 4 260 900
Consumer Help and Support Desk :					100%					100%
CAPEX	Improve existing help-desk to provide one-stop service	Sum	1	R 200 000	R 200 000	R 0	R 0	R 0	R 0	R 200 000
OPEX	Maintain help-desk	Sum	1	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 500 000
Schools awareness :					20%	20%	20%	20%	20%	100%
CAPEX	Prepare schools competition, awareness, retrofit	No	10	R 20 000	R 40 000	R 40 000	R 40 000	R 40 000	R 40 000	R 200 000
OPEX	Monthly schools awareness campaign	No	10	R 2 000	R 20 000	R 20 000	R 20 000	R 20 000	R 20 000	R 100 000

TECHNICAL INTERVENTIONS										
Bulk metering :					50%	50%				100%
CAPEX	New meter installations required	No	5	R 50 000	R 125 000	R 125 000	R 0	R 0	R 0	R 250 000
OPEX	Maintenance of existing bulk meters	No	10	R 1 000	R 10 000	R 10 000	R 10 000	R 10 000	R 10 000	R 50 000
Sectorisation :					50%	50%				100%
CAPEX	Setup of new DMA / PMAs	No		R 50 000	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Maintenance of DMA / PMAs including step testing	No	4	R 25 000	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 500 000
Active Leakage Control :					50%	50%				100%
CAPEX	Not applicable	No		R 0	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Fix all visible and reported leaks	No	267	R 1 000	R 267 000	R 267 000	R 267 000	R 267 000	R 267 000	R 1 335 000
Valve audits					20%	20%	20%	20%	20%	100%
CAPEX	Locate, clean, repair, document network valves	No	1 068	R 4 000	R 854 400	R 854 400	R 854 400	R 854 400	R 854 400	R 4 272 000
OPEX	Maintain network valves	No	214	R 1 000	R 213 600	R 213 600	R 213 600	R 213 600	R 213 600	R 1 068 000
Leak and logging equipment :					25%	25%	25%	25%		100%
CAPEX	Procure basic WDM equipment	Sum	2	R 20 000	R 10 000	R 10 000	R 10 000	R 10 000	R 0	R 40 000
OPEX	Not applicable	Sum			R 0	R 0	R 0	R 0	R 0	R 0
Telemetry :						50%	50%			100%
CAPEX	Install telemetry sites	No		R 15 000	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Maintain telemetry sites	No		R 1 500	R 0	R 0	R 0	R 0	R 0	R 0
Retrofitting and removal of wasteful devices :					20%	20%	20%	20%	20%	100%
CAPEX	Retrofit government buildings, schools, etc.	No	2 841	R 1 000	R 568 120	R 568 120	R 568 120	R 568 120	R 568 120	R 2 840 600
OPEX	Not applicable	No		R 0	R 0	R 0	R 0	R 0	R 0	R 0
Mains replacement :					20%	20%	20%	20%	20%	100%
CAPEX	Replace critical leaking mains	km	5.3	R 100 000	R 106 800	R 106 800	R 106 800	R 106 800	R 106 800	R 534 000
OPEX	Not applicable	km		R 0	R 0	R 0	R 0	R 0	R 0	R 0
Pressure management :					50%	50%				100%
CAPEX	New pressure management installations	No	4	R 75 000	R 150 000	R 150 000	R 0	R 0	R 0	R 300 000
OPEX	Maintain pressure management installations	No	4	R 5 000	R 20 000	R 20 000	R 20 000	R 20 000	R 20 000	R 100 000
Control valve management :					50%	50%				100%
CAPEX	New control valve installations	No		R 0	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Maintain all control valve installations	No		R 5 000	R 0	R 0	R 0	R 0	R 0	R 0
Consumer metering :					20%	20%	20%	20%	20%	100%
CAPEX	Replacement of old water meters	No	1 420	R 1 200	R 340 872	R 340 872	R 340 872	R 340 872	R 340 872	R 1 704 360
OPEX	Replacement of broken and cycled water meters	No	710	R 1 200	R 852 180	R 852 180	R 852 180	R 852 180	R 852 180	R 4 260 900
Top consumer audit :					20%	20%	20%	20%	20%	100%
CAPEX	Audit and retrofit non domestic consumers	No	710	R 10 000	R 1 420 300	R 1 420 300	R 1 420 300	R 1 420 300	R 1 420 300	R 7 101 500
OPEX	Maintain non domestic consumers installations	No	710	R 500	R 355 000	R 355 000	R 355 000	R 355 000	R 355 000	R 1 775 000
GIS / CAD system :					50%	50%				100%
CAPEX	Setup CAD/ GIS system	Sum	1	R 200 000	R 100 000	R 100 000	R 0	R 0	R 0	R 200 000
OPEX	Maintain CAD / GIS system	Sum	1	R 200 000	R 200 000	R 200 000	R 200 000	R 200 000	R 200 000	R 1 000 000
Management Information System :					50%	50%				100%

CAPEX	Setup basic MIS system to support WDM	Sum	1	R 200 000	R 100 000	R 100 000	R 0	R 0	R 0	R 200 000
OPEX	Maintain MIS system	Sum	1	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 500 000
Water loss monitoring and audits:					100%					100%
CAPEX	Perform proper analysis of distribution network	Sum	1	R 200 000	R 200 000	R 0	R 0	R 0	R 0	R 200 000
OPEX	Perform ad hoc analysis to monitor interventions	Sum	1	R 20 000	R 20 000	R 20 000	R 20 000	R 20 000	R 20 000	R 100 000

Item	Type			Year 1	Year 2	Year 3	Year 4	Year 5	Total
TOTAL COSTS									
Institutional	CAPEX			R 200 000	R 0	R 200 000	R 0	R 0	R 400 000
	OPEX			R 175 000	R 175 000	R 175 000	R 175 000	R 175 000	R 875 000
	TOTAL			**R 375 000**	**R 175 000**	**R 375 000**	**R 175 000**	**R 175 000**	**R 1 275 000**
Financial	CAPEX			R 200 000	R 100 000	R 100 000	R 0	R 0	R 400 000
	OPEX			R 3 124 660	R 3 124 660	R 3 124 660	R 3 124 660	R 3 124 660	R 15 623 300
	TOTAL			**R 3 324 660**	**R 3 224 660**	**R 3 224 660**	**R 3 124 660**	**R 3 124 660**	**R 16 023 300**
Social	CAPEX			R 580 872	R 380 872	R 380 872	R 380 872	R 380 872	R 2 104 360
	OPEX			R 972 180	R 972 180	R 972 180	R 972 180	R 972 180	R 4 860 900
	TOTAL			**R 1 553 052**	**R 1 353 052**	**R 1 353 052**	**R 1 353 052**	**R 1 353 052**	**R 6 965 260**
Technical	CAPEX			R 3 975 492	R 3 775 492	R 3 300 492	R 3 300 492	R 3 290 492	R 17 642 460
	OPEX			R 2 137 780	R 2 137 780	R 2 137 780	R 2 137 780	R 2 137 780	R 10 688 900
	TOTAL			**R 6 113 272**	**R 5 913 272**	**R 5 438 272**	**R 5 438 272**	**R 5 428 272**	**R 28 331 360**
Total	CAPEX			R 4 956 364	R 4 256 364	R 3 981 364	R 3 681 364	R 3 671 364	R 20 546 820
	OPEX			R 6 409 620	R 6 409 620	R 6 409 620	R 6 409 620	R 6 409 620	R 32 048 100
	TOTAL			**R 11 365 984**	**R 10 665 984**	**R 10 390 984**	**R 10 090 984**	**R 10 080 984**	**R 52 594 920**
				R 11 365 984	R 10 665 984	R 10 390 984	R 10 090 984	R 10 080 984	

BENEFITS

Item	Unit			Year 1	Year 2	Year 3	Year 4	Year 5	Total
CHANGE IN CONSUMPTION									
Reduced input volume				20%	40%	60%	80%	100%	300%
Volume	m^3/annum	495 830		99 166	198 332	297 498	396 664	495 830	1 487 490
Amount	R / annum	495 830	R 5.00	R 495 830	R 991 660	R 1 487 490	R 1 983 320	R 2 479 150	R 7 437 448
Increased revenue water				20%	40%	60%	80%	100%	300%
Volume	m^3/annum	522 000		104 400	208 800	313 200	417 600	522 000	1 566 000
Amount	R / annum	522 000	R 5.00	R 522 000	R 1 044 000	R 1 566 000	R 2 088 000	R 2 610 000	R 7 830 000
Total	**R / annum**			**R 1 017 830**	**R 2 035 660**	**R 3 053 490**	**R 4 071 320**	**R 5 089 150**	**R 15 267 449**

Payback period - years **3.4**

WC/WDM Projection summary and targets

Municipality name	Musina

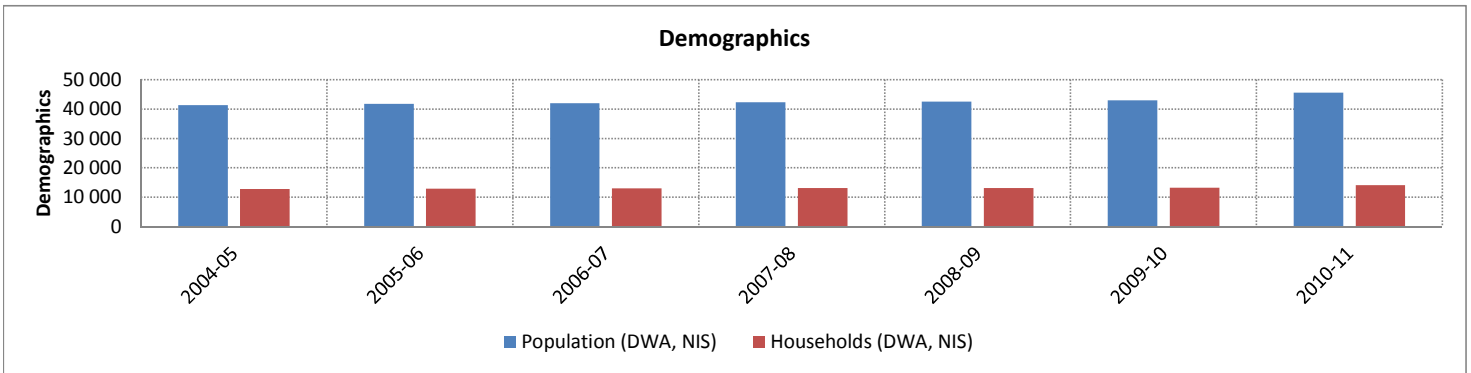
Water Demand projection	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Less 5.0% WDM Scenario							4.92	4.93	4.93	4.94	4.95	4.95
Less 7.5% WDM Scenario							4.90	4.88	4.87	4.85	4.84	4.82
Less 10.0% WDM Scenario							4.88	4.84	4.81	4.77	4.73	4.69
Actual Demand	3.54	4.36	4.13	4.23	4.32	4.64	4.96					
High population No WDM							4.96	5.01	5.06	5.11	5.16	5.21
Current yield	5.11	5.11	5.11	5.11	5.11	5.11	5.11	5.11	5.11	5.11	5.11	5.11

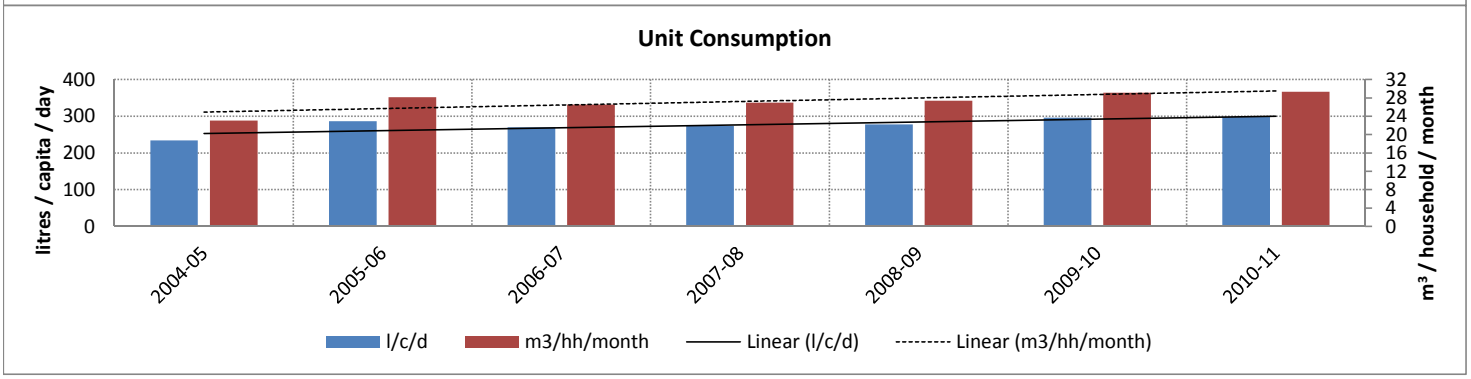
Savings	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Less 5.0% WDM Scenario							0.04	0.08	0.13	0.17	0.22	0.26
Less 7.5% WDM Scenario							0.06	0.13	0.19	0.26	0.32	0.39
Less 10.0% WDM Scenario							0.08	0.17	0.25	0.34	0.43	0.52
Actual savings							0.00					

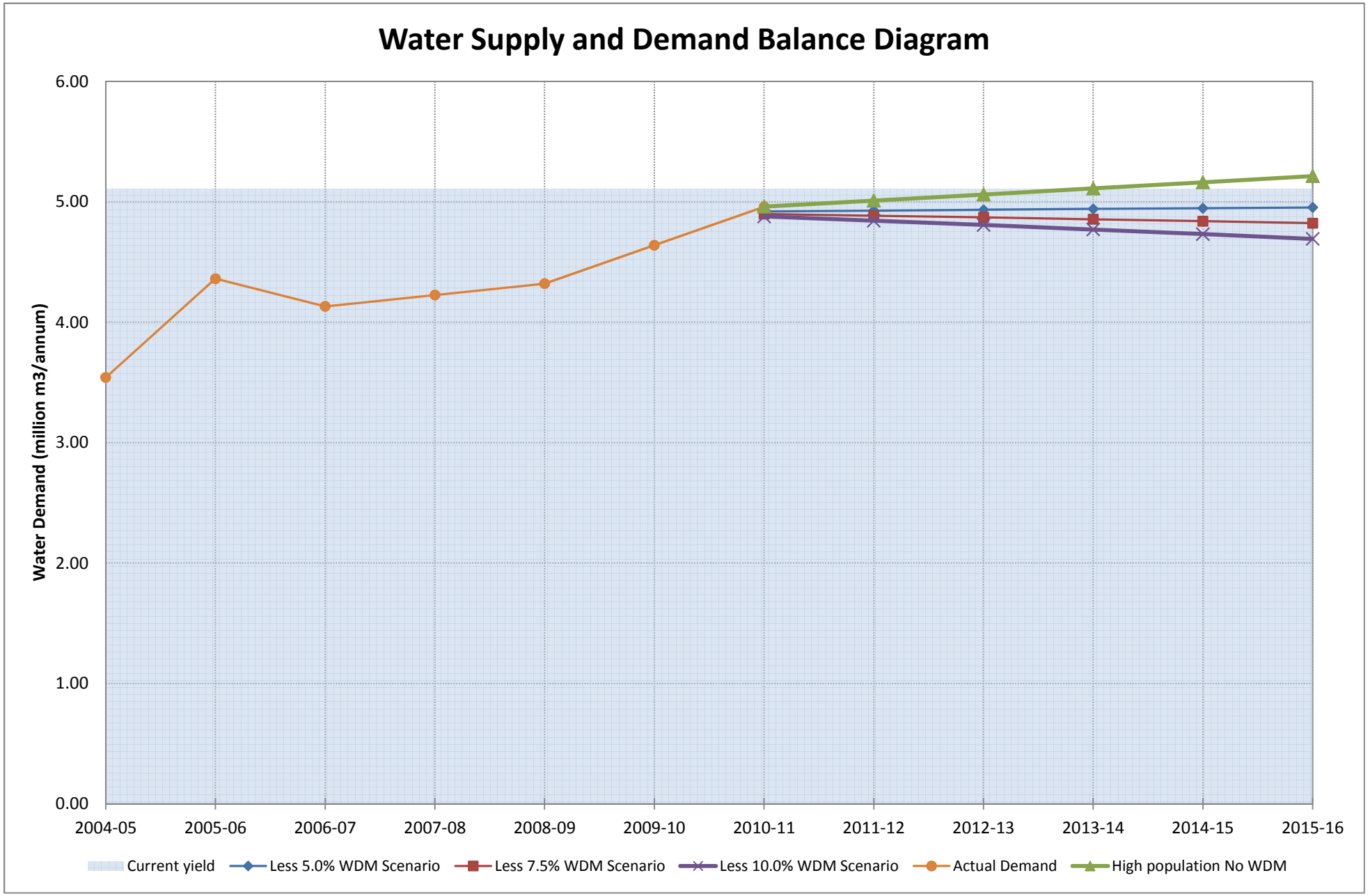
% Reduction	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Less 5.0% WDM Scenario							0.83%	1.67%	2.50%	3.33%	4.17%	5.00%
Less 7.5% WDM Scenario							1.25%	2.50%	3.75%	5.00%	6.25%	7.50%
Less 10.0% WDM Scenario							1.67%	3.33%	5.00%	6.67%	8.33%	10.00%

Year / Year % Growth	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Less 5.0% WDM Scenario								0.2%	0.1%	0.1%	0.3%	0.3%
Less 7.5% WDM Scenario								-0.3%	-0.3%	-0.3%	-0.6%	-0.7%
Less 10.0% WDM Scenario								-0.7%	-0.7%	-0.8%	-1.6%	-1.6%
Actual Demand		23.2%	-5.3%	2.3%	2.2%	7.4%	6.9%					
High population No WDM								1.0%	1.0%	1.0%	1.0%	1.0%

Key Performance Indicators	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Population (DWA, NIS)	41 389	41 745	41 997	42 314	42 568	43 003	45 583					
Households (DWA, NIS)	12 791	12 901	12 977	13 076	13 153	13 287	14 084					
l/c/d	234	286	270	274	278	296	298					
m3/hh/month	23	28	27	27	27	29	29					
Demand Ml/day	10	12	11	12	12	13	14					






Water Supply and Demand Balance Diagram
Water Demand (million m3/annum)
6.00
5.00
4.00
3.00
2.00
1.00
0.00
2004-05
2005-06
2006-07
2007-08
2008-09
2009-10
2010-11
2011-12
2012-13
2013-14
2014-15
2015-16
Current yield
Less 5.0% WDM Scenario
Less 7.5% WDM Scenario
Less 10.0% WDM Scenario
Actual Demand
High population No WDM

WCWDM STRATEGY : RPMS Compliance

Municipality name	Musina

Key questions from the Regulatory Performance Measurement System (RPMS) related to WC/WDM

KPI		ID	WSA Value
KPI 1 – Access to Water			
KPI 2 – Access to Sanitation			
KPI 3 – Access to Free Basic Water			
	Total poor households receiving Free Basic Water for last financial year	ID:012	
	Total poor households	ID:013	
KPI 4 – Access to Free Basic Sanitation			
	Total poor households receiving Free Basic Sanitation for last financial year	ID:014	
	Total poor households	ID:013	
KPI 5 – Drinking Water Quality			
KPI 6 –Wastewater Quality			
KPI 7 - Customer Services Standards			
Component 1 – Service Interruptions			
	Total number of Service interruptions in the last financial year	ID:034	
	Number of interruptions in continuous service to consumers, where interruption for a single incident was greater than 24h	ID:033	
Component 2 – CRM Systems			
	Does the WSA have a customer Charter	ID:036	
	Does the WSA have a customer service centre	ID:035	
	Is there a system to manage customer queries and log faults	ID:038	
	Does the incident tracking system escalate complaints if not responded to within a prescribed time?	ID:037	
KPI 8 - Institutional Effectiveness			
Component 1 - Institutional Effectiveness			
	Completed WSDP is approved by Council for the last financial year?	ID:039	
	Required policies are in place and approved by Council?	ID:040	
	Required bylaws are in place and approved by Council?	ID:041	
	Contracts and Service level agreements in place with all appropriate service delivery role-players (WSPs, internal etc)	ID:042	
	The WSA monitors the KPIs defined by the contract or SLA?	ID:043	
Component 2 - Water Services Staff Effectiveness			
	Total Water Services staff costs for the last financial year	ID:045	
	Total cost of water and sanitation provision for the last financial year including interest and depreciation (expenditure)	ID:046	
	Total budgeted for water services staff according to the approved organogram for the last financial year	ID:078	
Component 3 - Grant Funding Effectiveness			
	Total grant funding allocation received for the last financial year	ID:048	
	Total grant funding allocation spent for the last financial year	ID:047	
Component 4 - WSA Annual Report			
	WSA annual report submitted to Minister	ID:077	
Component 5 - % Filled Posts on Organogram			
	Total number of posts on Council-approved organogram for the last financial year for water services staff	ID:080	
	Total number of posts filled on the approved water services organogram in the last financial year	ID:079	

KPI 9 - Financial Performance			
Component 1 – Financial Integrity			
	Is WSA ring-fenced? (Separate legal entity=3, Separate accounting entity=2, Partially ring-fenced=1, Not ring-fenced at all=0)	ID:049	
	Audit report evaluation. (Unqualified=4, Qualified=3, Adverse=2, Disclaimer=1, No report=0)	ID:050	
Component 2 – Average Debtor Days			
	Water Services sales income for the last financial year (water/sanitation)	ID:052	
	Total outstanding customer/consumer debt for water and sanitation for the last financial year	ID:051	
Component 3 – Revenue Collection Effectiveness			
	Water Services sales income for the last financial year (water/sanitation)	ID:052	
	Water Services billed income actually received from consumers for last financial year	ID:053	
Component 4 – Average Creditor Days			
	Total bulk water purchases for the last financial year	ID:055	
	Total bulk water accounts outstanding for the last financial year	ID:054	
Component 5 – Financial Sustainability			
	Total water and sanitation income for the last financial year	ID:056	
	Total cost of water and sanitation provision for the last financial year including interest and depreciation (expenditure)	ID:046	
Component 6 – Financial Effectiveness			
	Total outstanding customer/consumer debt (after provisions) for water and sanitation for the last financial year	ID:051	
	Total provision for doubtful debt for water and sanitation for the last financial year	ID:082	
KPI 10 Strategic Asset Management			
Component 1 - Capital Spent on Rehabilitation and Replacement			
	Total capital budget (Water and Sanitation) in the last financial year	ID:063	
	Total capital spent on refurbishment and replacement in the last financial year	ID:062	
Component 2 –Asset Management Effectiveness			
	Asset management plan status	ID:057	
	Asset register status	ID:058	
	Asset management system is electronic	ID:059	
Component 3 – O&M Expenditure			
	Total spent on O&M/Annual maintenance cost (Water and Sanitation) in the last financial year	ID:060	
	Replacement value of assets (water services infrastructure)	ID:061	
Component 4 – Replacement Saving			
	Depreciation value for the last financial year (Water and Sanitation infrastructure)	ID:065	
	Contribution to asset replacement fund for the last financial year. (Water and Sanitation)	ID:064	
Component 5 – Asset Register Monitoring			
	Asset register field monitored: Date acquired	ID:066	
	Asset register field monitored: Estimated remaining life of asset	ID:068	
	Asset register field monitored: Replacement value of asset	ID:070	
	Asset register field monitored: Purchase cost of asset	ID:069	
	Asset register field monitored: Description of asset (Yes/No)	ID:067	
KPI 11 Water Demand Management			
	System input volume (external sources) for the last financial year	ID:121	
	System input volume (own sources) for the last financial year	ID:122	
	Total billed metered water consumption (volume) for the last financial year	ID:071	
	Total billed unmetered water consumption (volume) for the last financial year	ID:074	
	Total unbilled metered water consumption (volume) for the last financial year	ID: 073	
	Total unbilled unmetered water consumption (volume) for the last financial year	ID: 123	
ADDITIONAL QUESTIONS FOR WATER USE EFFICIENCY			

	Water Conservation and Water Demand Management plan		
	Installation of water efficient devices		
	Repair of leaks		
	Measurement or control of water supplied		
	Pressure management		
Additional KPI : Tariff Data			
	Which of the listed elements are taken into account when you determine your tariff? Indicate from the list provided	ID: 201	
	Total amount of subsidies allocated to water for the next financial year	ID: 202	
	Total projected cost of water provision for the next financial year	ID: 203	
	Does your tariff recognise the difference between levels of service (according to Regulation 4 under s10 of the Water Services Act)?	ID: 204	
	Does your tariff recognise the difference between socio-economic status of customers (according to s10 of the Water Services Act)?	ID: 205	
	Do you charge a rising block tariff?	ID: 206	
	How many blocks are in your tariff structure?	ID: 207	
	What is your approved standard tariff? (Basic levy)	ID: 208	
	What are the actual 2010/2011 tariffs for the following consumer categories?	ID: 209	
	Do you reflect your tariff structure on your bill?	ID: 210	
	What are the quantities of water supplied to the following consumer categories (annually)?	ID: 211	
	What is the unit number of consumers served with water in each consumer category?	ID: 212	
	Do you have a seasonal tariff in your WSA?	ID: 213	
	Does your tariff include a fixed charge?	ID: 214	
	If a fixed charge is levied, do you subsidise the FBW?	ID: 215	
	What other sources of water services revenue (other than tariffs) does your WSA have? Indicate sources on the list provided	ID: 216	
	Total annual water services surplus / deficit	ID: 217	

water affairs

Department:
Water Affairs
REPUBLIC OF SOUTH AFRICA

Department of Water Affairs

Water Demand Management Strategy and Business Plan

for Mutale Local Municipality

May 2013

WCWDM STRATEGY AND BUSINESS PLAN: Signature Page

Title :	**Development of a Water Conservation and Water Demand Management Strategy and Business Plan for Mutale Local Municipality**			
Authors :	**WA Wegelin, Z Siqalaba, N Zondo**			
Study Name:	**Development of a First Order Water Conservation and Water Demand Management Strategy and Business Plan for Various Municipalities under the DWA Luvuvhu Letaba Programme : Limpopo Province**			
Status of Report :				
Consultants :	**WRP Consulting Engineers (Pty) Ltd**			
Approved for Consultants :	Study leader	WA Wegelin, PrEng		
	Position	**Name**	**Signature**	**Date**
Municipality	**Mutale**			
Approved for municipality :	Municipal Manager			
	Position	**Name**	**Signature**	**Date**
Department of Water Affairs	**Limpopo Region**			
Approved for Regional Office :				
	Position	**Name**	**Signature**	**Date**
Department of Water Affairs	**Head Office**			
Approved for Head Office				
	Position	**Name**	**Signature**	**Date**

WCWDM STRATEGY AND BUSINESS PLAN: Contact details

Province	**Limpopo**		**No**
Municipal Code	**LIM342**		**B4**
District Municipality	**Vhembe**		
Municipality	**Mutale**		
Settlements	**Masisi, Mutale**		

Information provided by			
Date			
Contact person	Mr Mugeri		
Position	Water Services Manager		
Telephone	083 313 0587		
E-mail	mugeris@mutale.gov.za		
Study team contact			
Company	WRP Consulting Engineers		
Address	PO Box 1522, Brooklyn Square, 0075		
Contact person	Mr Willem Wegelin		
Telephone number	012 346 3496	**Cell number**	083 4477 999
E-mail	willemw@wrp.co.za		

Water Affairs contact			
Directorate	Water Use Efficiency		
Address	Private Bag X313, Pretoria, 0001		
Contact person	Koena Given Moabelo		
Telephone number	012 336 8174	**Cell number**	082 653 9216
E-mail	MoabeloK@dwa.gov.za		

Water Balance Data Confidence Level (see legend below)	
Input volume	Estimated values
Authorised consumption (Engineering functions)	Estimated values
Meter reading and billing (Finance functions)	Estimated values
Legend	
High level of accuracy	Calibrated bulk meters, >98% of consumers are metered < 10 years old, <2% billing complaints
Medium level of accuracy	Functional bulk meters, >90% of consumers are metered, <10% billing complaints
Low level of accuracy	Some functional bulk meters, >50% consumer meters, any age, meter reading & billing dysfunctional
Estimated values	No bulk or consumer meter readings, best estimate of water consumption
No data	No data and no idea of water consumption

WCWDM STRATEGY AND BUSINESS PLAN: Executive Summary

Province	Limpopo	**WSA**	**No**
Municipal Code	LIM342	**Category**	**B4**
District Municipality	Vhembe		
Municipality	Mutale		
Settlements	Masisi, Mutale		

Executive summary

Status quo

Very limited WCWDM activities are undertaken in the WSA and there is little management information available to perform a proper assessment of the water losses and potential savings. This assessment is in line with the RPMS, Blue Drop assessments, IDP and WSDP. Most of the towns are informal with formal infrastructure in a relatively smaller area within the LM which enables limited metering, billing and cost recovery in the WSA. The current metering, billing and cost recovery systems are adequate however improvements can be made in the capturing and tracking of monthly management information.
The engineering department in the Local Municipality is characterised by high vacancies and low capacity and skills.
The current estimated unit consumption of 2791 l/c/d is high and provides good scope for significant reduction but a more detailed analysis is required to verify this number. It seems there has been a drastic decrease in the average unit consumption in the area. The relationship with the community is generally positive and the communities themselves are characterised by high unemployment and a large indigent population. The water tariffs are not promoting WCWDM, are not cost reflective but consumers do value water supply.

Strategy

The municipality should focus on proper record keeping, analysis and development of detailed management information. All vacancies must be filled as a matter of priority together with skills transfer and capacity building. The engineering and finance department must work closer together at the LM and DM level to improve metering, billing and cost recovery and start with a meter audit to further improve cost recovery.
A steering committee should be setup to report on a monthly basis to council on water loss figures, leaks repaired, targets, progress, consumer metering, billing and cost recovery.
Proper metering, billing and cost recovery should be supported by community awareness that promotes reporting of leaks, fixing of private leaks and efficient use. Based on the available information, a target reduction in NRW of 97.5%own to 93.4% and target input volume reduction of 4.1% have been set. Review the water tariff structure to ensure it reflects true cost, promote WCWDM and work towards compliance with RPMS and improve IDP.

Business Plan

The budget requirements for the next five years are summarised in the table below:

Intervention	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Institutional	350 000	150 000	350 000	150 000	150 000	1 150 000
Financial	5 532 580	5 432 580	5 432 580	5 332 580	5 332 580	27 062 900
Social	5 114 076	4 914 076	4 914 076	4 914 076	4 914 076	24 770 380
Technical	8 691 256	8 491 256	8 178 756	8 178 756	8 168 756	41 708 780
Total	**19 687 912**	**18 987 912**	**18 875 412**	**18 575 412**	**18 565 412**	**94 692 060**

Compliance

Results from the Regulatory Performance Measurement System (RPMS)

Key Performance Indicators	Achieved KPI Score	Required score	Performance assessment
KPI 1: Access to water supply [Overall KPI compliance score]	1.87	3	Concern
KPI 2: Access to sanitation [Overall KPI compliance score]	3.113	3	Adequate
KPI 3: Access to Free Basic Water [Overall KPI compliance score]	5	3	Excellent
KPI 4: Access to Free Basic Sanitation [Overall KPI compliance score]	0	3	Crisis
KPI 5: Drinking Water Quality management [Overall KPI compliance score]	1	3	Crisis
KPI 6: Wastewater quality management [Overall KPI compliance score]	0	3	Crisis
KPI 7: Customer service quality [Overall KPI compliance score]	3.5	3	Good
KPI 8: Institutional effectiveness [Overall KPI compliance score]	3.276	3.5	Concern
KPI 9: Financial performance [Overall KPI compliance score]	0.571	4	Crisis
KPI 10: Strategic asset management [Overall KPI compliance score]	3.375	3	Good
KPI 11: Water use efficiency [Overall KPI compliance score]	0	3	Crisis

Results from Blue and Green Drop Assessments

Assessment	Year	Microbiological	Chemical	Physical & Organoleptic	Operational	Total
Blue drop	2012	99.90%	99.90%	0.00%	46.40%	77.17%
Green drop	2011	0.00%	0.00%	0.00%	0.00%	6.30%

WCWDM STRATEGY AND BUSINESS PLAN: Municipal Water Conservation and Water Demand Management Implementation Process Map

Strategy and Planning Phase

Performed by WCWDM Strategy Steering Committee (MEC, Municipal Manager, Technical and Financial Directors)
Reviewed by SSC and DWA

Implementation

Performed by Department
Reviewed by SSC and DWA

Monitoring and Review

Performed by Department
Reviewed by SSC and DWA

Vision

Water Services Act, 108 of 1997

Provide water services in an efficient, affordable, equitable, economical and sustainable manner to all consumers or potential consumers in its area of jurisdiction.

BIG HAIRY AND AUDACIOUS VISION
If it doesn't scare you, its not big enough

Mission

Presidential Target
(State of the Nation address 2010)

Reduce water Losses by half by 2014

Status Quo

Technical

Information on demographics, demands, water loss, level of service

Key water loss contributing factors

Key performance indicators and targets

Asset value and condition

Departmental organogram

Economic

Tariffs

Metering, billing and revenue collection status

Existing sources of funding

Social

Customer profile

Communication dynamics between WSA and consumers

Existing support structures for consumers

Level of stakeholder involvement

Institutional

Existence of approved policies

Existence of approved bylaws

Regulatory compliance

Legislative compliance

Strategy

Technical

SWOT Analysis : Strengths, Weaknesses, **Opportunities** & **T**hreats of technical department (human resources, processes,
Goals and objectives: Achieving water loss reduction target in terms of available resources and non-revenue water. If no target exists, then goal is to develop a target.
How : Identify key principles to achieve target (user pay, water restrictions, consumer education, etc.)
Actions : Responsible person, measurement and timelines to address SWOT analysis

Economic

SWOT Analysis : Strengths, Weaknesses, **Opportunities** and **T**hreats of funding sources
Goals and objectives: Allocate sufficient funding to address WCWDM
How : Identify key principles to obtain funding (improved metering and billing, cost recovery, external funding, etc.)
Actions : Responsible person, measurement and timelines to address SWOT analysis

Social

SWOT Analysis : Strengths, Weaknesses, **Opportunities** and **T**hreats of consumers and institution
Goals and objectives: Informed and supportive consumer and institution
How : Identify key principles to develop turn consumers into customers (political, schools, specific consumer groups, water wise, etc.)
Actions : Responsible person, measurements and timelines to address SWOT analysis

Institutional

SWOT Analysis : Strengths, Weaknesses, **Opportunities** and **T**hreats of policies, bylaws, political support , enforcement, Regulatory compliance
Goals and objectives: Reform organisation to support WCWDM
How : Identify key principles to obtain improve (improved political support, policies, enforcement, etc.)
Actions : Responsible person, measurement and

Business Plan

Technical

Bulk metering
Leakage control and repair
Sectorisation and zone metering
Logging and water loss monitoring
Non domestic and domestic metering and audits
Resolve intermittent supply
Pressure management
Clean out and recommission existing infrastructure
Training and capacity building

Economic

Review tariff structure
Ensure effective metering and billing system
Review CAPEX budget in terms of WDM goals
Review OPEX budget in terms of WDM goals
Develop business plan for external funding
Training and capacity building

Social

Raise awareness at political levels
Raise awareness at institutional levels
Identify and engage relevant stakeholders
Establish customer care centre
Training and capacity building
Conduct WC/WDM education and awareness
Conduct schools awareness campaigns

Institutional

Establish policies in terms of payment for services, arrears,
Establish bylaws that addresses water loss reduction and efficiency
Succession planning - ensure initiatives continue

Implementation

All Projects

Council approval of Strategy and Business Plan

Identify key stakeholders - setup working committees

Appoint PSP

Appoint contractor

Assess / determine baseline

Implement interventions

Project Quality Control

Project Financial Management

Establish record keeping and reporting processes

Assess benefits from implementation

Establish take-over procedure

Training and capacity building

Deliverables

Technical

Record keeping and reporting process
Monthly IWA Water Balance calculation for system and DMA
No visible leakage
Asset management
Comply with Regulations R509 of 2001
Responsible WCWDM individual/unit

Measurement against goals

Economic

Sufficient budget allocation
Realistic tariff setting
Efficient meter reading, billing and cost recovery process

Measurement against goals

Social

Political support
Institutional support
Informed, involved and supportive consumer

Measurement against goals

Institutional

Approved policies
Approved bylaws
Policy and bylaws enforcement
Regulatory compliance
Succession plan

Measurement aga[illegible]als

Deliverables

Review and update strategy and business plan . Implement and regulate.

Detailed management information

DWA Planning and target setting, Review strategies and Business Plans and align with targets, Possible funding, Technical and Institutional Support, Develop generic Policies and bylaws, Develop Regulations and Regulate, Report to Precedency

WCWDM STRATEGY : Definitions

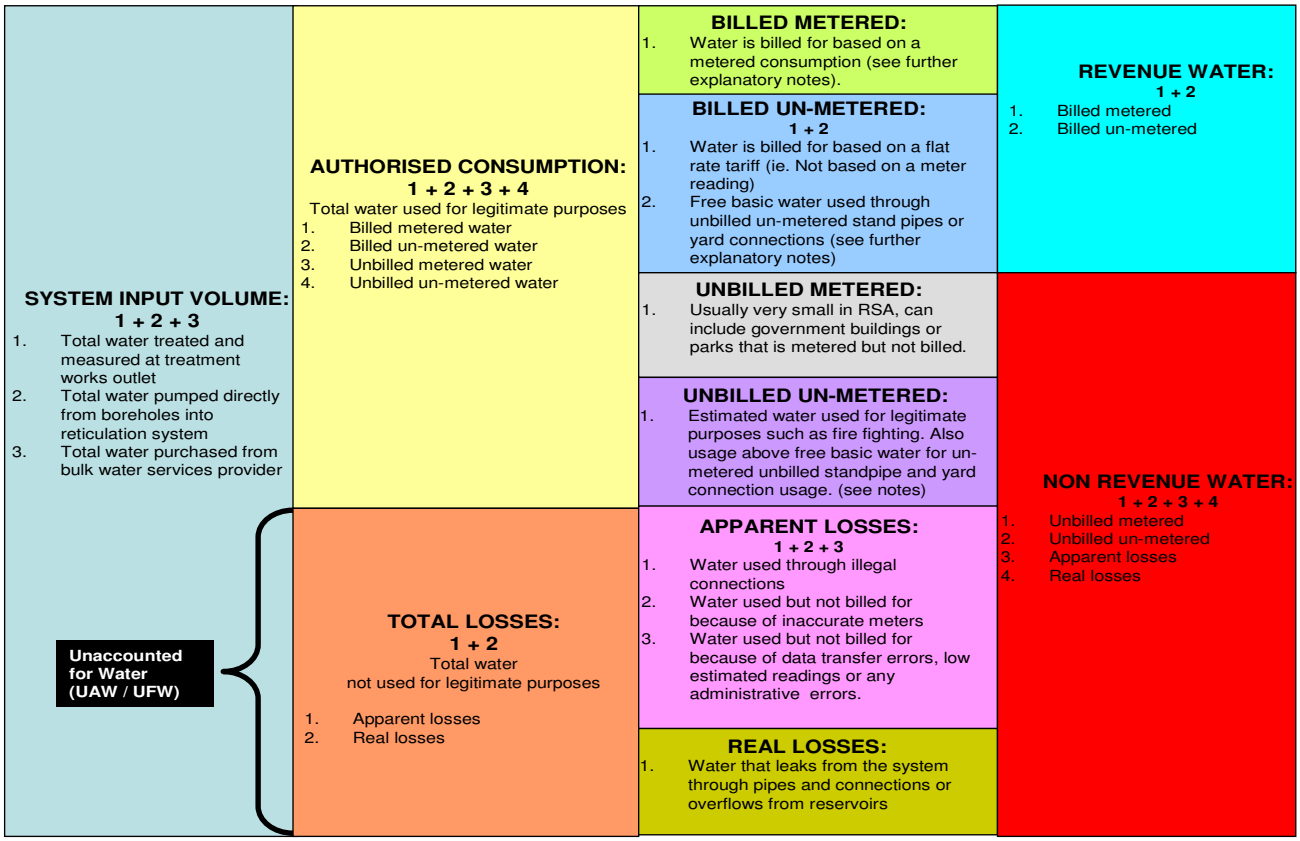
Terminology

Acronym	Description	Link
DWA	Department of Water Affairs	http://www.dwa.gov.za
WS RPMS	Water Services : Regulatory Performance Measurement System	http://www.dwa.gov.za/dir_ws/rpm/
WS NIS	Water Services : National Information System	http://www.dwa.gov.za/dir_ws/wsnis/
FBS	Water Services : Free Basic Water Project	http://www.dwaf.gov.za/dir_ws/fbw/
NRW	Non-revenue water. Volume of water for which no revenue is received (preferred term)	
UAW or UFW	Unaccounted-for water. Volume of water lost due to physical and apparent losses (not preferred term)	
StatsSA NFC	Statistics South Africa : Non-Financial Census of Municipalities P9115	http://www.statssa.gov.za/

Information sources

Item	Source	Calculation
Population	DWA WS NIS or municipality	
Households	DWA WS NIS or municipality	
Connections - metered	Extrapolated 2007 DWA - WS FBW serviced above RDP or municipality	
Connections - Unmetered	Extrapolated 2007 DWA - WS FBW serviced at RDP or municipality	
Length of mains (km)	Actual value or calculated at average of 50 connections / km of mains	# connections ÷ 50
(A) System input volume	Total volume of potable water supplied by the municipality in kl/annum	
(B) Billed metered consumption	Total volume of water metered and billed by the municipality in kl/annum	
(C) Billed unmetered consumption	Total volume of water unmetered and billed by the municipality in kl/annum	
Underlined values	Calculated values using trends or averages	

Standard IWA Water Balance



Apparent Losses

Illegal connections	%	Water Quality	Meter age and accuracy	%	Data transfer	%
Very high	10%	Very poor	> 10 years	10%	Very poor	9%
High	8%	Poor		8%	Poor	7%
Average	6%	Average	5- 10 years	6%	Average	5%
Low	4%	Good		4%	Good	3%
Very low	2%	Very good	< 5 years	2%	Very good	1%

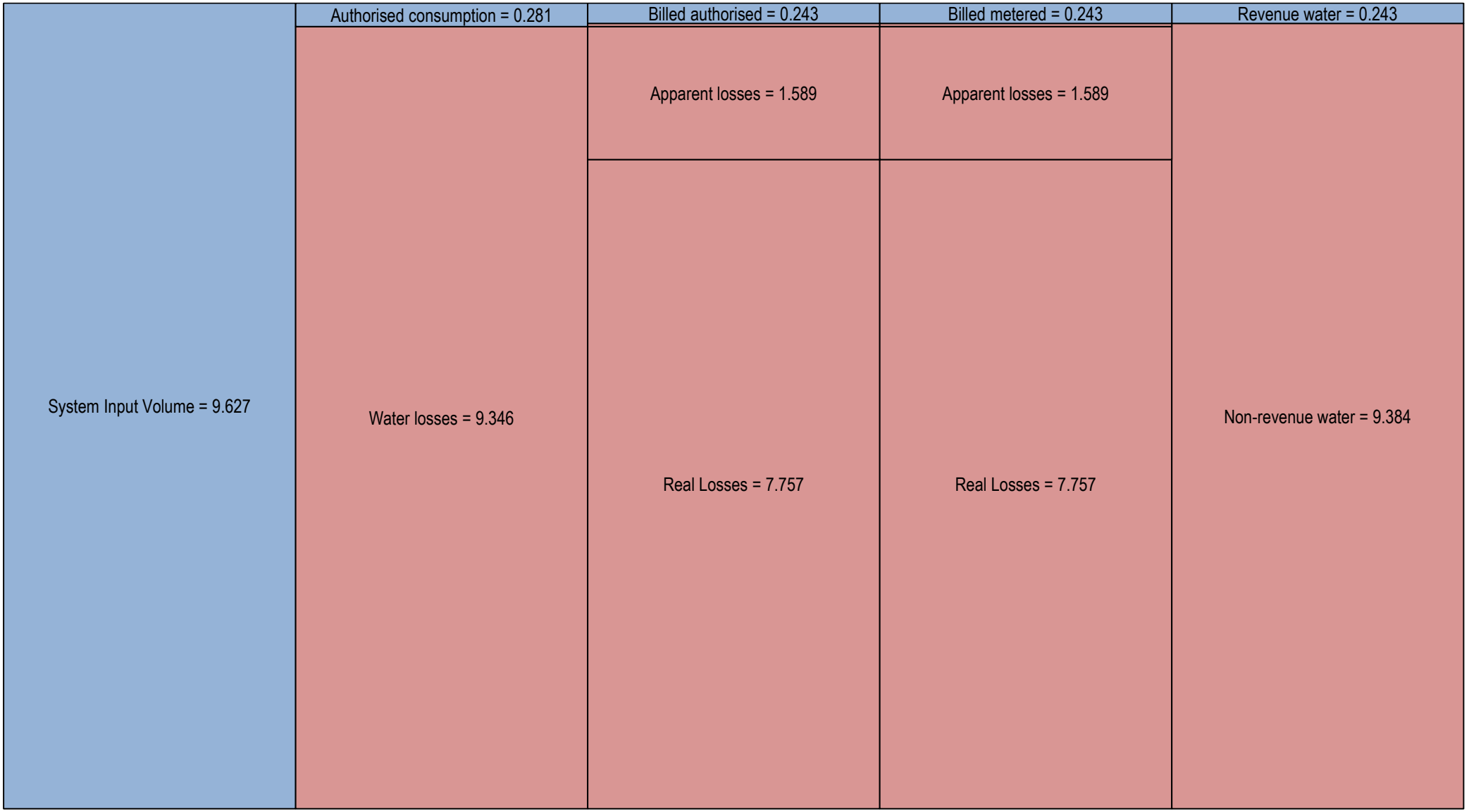
WCWDM STRATEGY : Base Information

Municipality name	Mutale			Date of current data	2010
			Current	Target	Change
Input Data	**Demographics**	**IDP Ref**			
	Population	**No**	**94 639**	**94 639**	**0**
	Urban	No			
	Rural	No	94 639	94 639	
	Households	**No**	**21 468**	**21 468**	**0**
	Urban	No			
	Rural	No	21 468	21 468	
	Household density	**Pop / HH**	**4.70**	**4.41**	
	Growth rate: 5 years	**Par 4.1.3** **%**	**4.0%**	**4.0%**	**0**
	Consumer units	**Par 3.3** **No**	**473**	**471**	**-2**
	Residential	No		0	
	Police stations	No	4	4	
	Magistrates Offices	No	2	2	
	Business	No		0	
	Dry industries	No		0	
	Office buildings	No		0	
	Prisons	No		0	
	Schools	No	463	463	
	Health facilities	No	4	2	
	Wet industries	No		0	
	Mining	No		0	
	Resorts and tourism	No		0	
	Infrastructure				
	Water Level of Service	**no**	**8 816**	**8 816**	**0**
	Stand pipes	HH			0
	Yard connections	HH	2 393	2 393	
	House connections	HH	6 423	6 423	
	Length of mains (km)	**km**	**420.0**	**420.0**	**0**
	Connections / km of mains	**No / km**	**21.0**	**21.0**	
	Average system pressure	**m**		**0**	**0**
	Time pressurised	**%**		**100%**	**1**
	Sanitation Level of Service		**0**	**0**	**0**
	None water borne	No			
	Water borne low flush	No			
	Septic tanks / conservancy	No			
	Water borne - WTW	No			
	Apparent losses	**%**	**17%**	**17%**	**0%**
	Consumer meter age	**%**	**6%**	**6%**	**0%**
	Illegal connections	**%**	**6%**	**6%**	**0%**
	Data transfer	**%**	**5%**	**5%**	**0%**
	Water balance data				
	System input volume	**kℓ/annum**	**9 626 718**	**6 257 367**	**-3 369 351**
	Own sources	**kℓ/annum**	**9 626 718**	**6 257 367**	**-3 369 351**
	Other sources	**kℓ/annum**			**0**
	Billed metered consumption	**kℓ/annum**	**242 842**	**412 831**	**169 989**
	Billed unmetered consumption	**kℓ/annum**			**0**
	Unbilled metered consumption	**kℓ/annum**	**37 887**	**37 887**	**0**
	Unbilled unmetered consumption	**kℓ/annum**			**0**

	Water Tariffs					
	Purchase of bulk water		R/annum			R 0.00
	Total operating cost		R/annum			R 0.00
	Rate - Purchase of bulk water		R/kℓ	#DIV/0!	#DIV/0!	
	Rate - Total operating		R/kℓ	R 0.00	R 0.00	
	Domestic Water Tariffs	Par 10.3				
	0 to	6	kℓ/month	R 0.00	R 0.00	R 0.00
	to		kℓ/month		R 0.00	R 0.00
	to		kℓ/month		R 0.00	R 0.00
	to		kℓ/month		R 0.00	R 0.00
	to		kℓ/month		R 0.00	R 0.00
	> to		kℓ/month		R 0.00	R 0.00
Water Balance Calculations	System input volume		kℓ/annum	9 626 718	6 257 367	-3 369 351
	Authorised Consumption		kℓ/annum	280 729	450 718	169 989
	Billed authorised		kℓ/annum	242 842	412 831	169 989
	Billed metered		kℓ/annum	242 842	412 831	169 989
	Billed unmetered		kℓ/annum	0	0	0
	Unbilled authorised		kℓ/annum	37 887	37 887	0
	Unbilled metered		kℓ/annum	37 887	37 887	0
	Unbilled unmetered		kℓ/annum	0	0	0
	Water losses		kℓ/annum	9 345 989	5 806 648	-3 539 341
	Apparent losses		kℓ/annum	1 588 818	987 130	0
	Real losses		kℓ/annum	7 757 171	4 819 518	-3 539 341
	UARL		kℓ/annum	0	0	0
	Potential real loss saving		kℓ/annum	7 757 171	4 819 518	-3 539 341
	Revenue water		kℓ/annum	242 842	412 831	169 989
	Non-Revenue water		kℓ/annum	9 383 876	5 844 535	-3 539 341
Key Performance Indicators	System input volume unit consumption					
	litres / capita / day		ℓ / c / d	279	181	-98
	m³ / household / month		m³ / hh / month	37	24	-13
	m³ / connection / month		m³ / conn / month	91	59	-32
	Authorised unit consumption					
	litres / capita / day		ℓ / c / d	8	13	5
	m³ / household / month		m³ / hh / month	1	2	1
	m³ / connection / month		m³ / conn / month	3	4	1
	Water loss indicators					
	UARL : Losses / connection / day		ℓ / conn / day	0	0	0
	CARL : Losses / connection / day		ℓ / conn / day	2 411	1 498	-913
	Infrastructure Leakage Index (ILI)		-	#DIV/0!	#DIV/0!	#DIV/0!
	Losses / km mains / day		m³ / km / day	50.6	31.4	-19
	Non-revenue water		%	97.5%	93.4%	-4.1%
	Unbilled Consumption		%	0.4%	0.6%	0.2%
	Water Losses		%	97.1%	92.8%	-4.3%
	Apparent losses		%	16.5%	15.8%	-0.7%
	Real losses		%	80.6%	77.0%	-3.6%
	Water balance reduction targets					
	System input volume		%		-35.0%	
	Authorised Consumption		%		60.6%	
	Billed authorised		%		70.0%	
	Billed metered		%		70.0%	
	Billed unmetered		%		0.0%	
	Unbilled authorised		%		0.0%	
	Unbilled metered		%		0.0%	
	Unbilled unmetered		%		0.0%	
Cost Analysis	Average monthly water bill / connection		R / conn / month	R 0	R 0	R 0
	Estimated annual income		R / annum	R 0	R 0	R 0
	Total water supply cost		R / annum	R 0	R 0	R 0
	Net profit / loss		R / annum	R 0	R 0	R 0
	Town and description		Source	Ml/day	m^3/annum	million m^3/annum

Water Source and Treatment Capacity	Mutale	Blue Drop 2012	6.05	2 208 454	2.208
				0	0.000
				0	0.000
				0	0.000
	Total		6.05	2 208 454	2.208

Current IWA Water Balance Diagram (million m^3/annum)

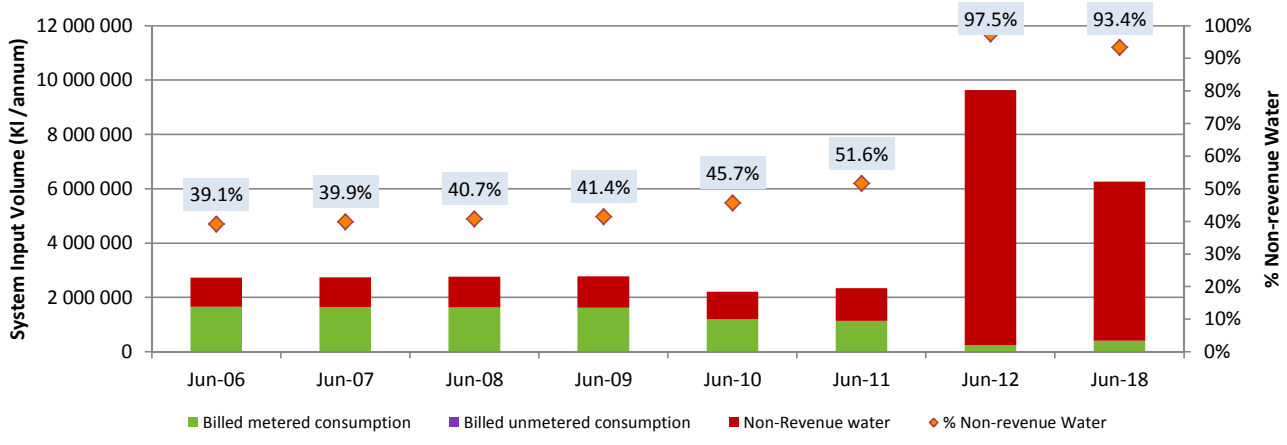


Target IWA Water Balance Diagram (million m^3/annum)

WCWDM STRATEGY : Water Balance History

Municipality Name	Mutale

	Year ending		Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	Jun-11	Jun-12	Jun-18
Input Data	Population		89 503	90 038	90 710	91 249	82 954	87 931	94 639	124 732
	Households		20 500	20 612	20 775	20 890	18 989	20 128	21 468	28 552
	Connections - metered		10 262	10 323	10 400	10 462	9 511	10 081	10 686	14 301
	Connections - Unmetered		10 360	10 417	10 499	10 557	9 596	10 172	10 783	14 429
	Length of mains (km)		309	311	313	315	286	303	322	430
	System input volume	kl/annum	2 723 091	2 739 368	2 759 813	2 776 212	2 208 454	2 340 962	9 626 718	6 257 367
	Billed metered consumption	kl/annum	1 657 457	1 647 609	1 635 403	1 625 743	1 200 000	1 132 075	242 842	412 831
	Billed unmetered consumption	kl/annum								0
	Unbilled metered consumption	kl/annum								412 831
	Unbilled unmetered consumption	kl/annum								0
Water Balance Calculations	Revenue water	kl/annum	1 657 457	1 647 609	1 635 403	1 625 743	1 200 000	1 132 075	242 842	412 831
	Non-Revenue water	kl/annum	1 065 634	1 091 760	1 124 411	1 150 470	1 008 454	1 208 886	9 383 876	5 844 535
	Water Losses	kl/annum	1 065 634	1 091 760	1 124 411	1 150 470	1 008 454	1 208 886	9 383 876	5 431 704
	% Non-revenue water		39.1%	39.9%	40.7%	41.4%	45.7%	51.6%	97.5%	93.4%
	% Water Losses		39.1%	39.9%	40.7%	41.4%	45.7%	51.6%	97.5%	86.8%
Key performance indicators	Input : Litres / capita / day		83	83	83	83	73	73	279	137
	Input: m³ / household / month		11	11	11	11	10	10	37	18
	Billed : Litres / capita / day		51	50	49	49	40	35	7	9
	Billed : m³ / household / month		7	7	7	6	5	5	1	1
	% Population growth		0.87%	0.60%	0.75%	0.59%	-9.09%	6.00%	7.63%	41.85%
	% Water demand growth		0.87%	0.60%	0.75%	0.59%	-20.45%	6.00%	311.23%	167.30%
Source of information										



Comments

WCWDM STRATEGY : Qualitative Scorecard

Municipality Name	Mutale

Introduction

The purpose of this section is to perform a qualitative evaluation of the municipality's water business. The objectives are as follows :

SWOT Analysis	External - Opportunities Positive external conditions which you don't control which you could take advantage of	External - Threats Negative conditions you don't control but could minimise their effects
Internal - Strengths Positive aspects under your control and on which you may wish to capitalise	Strengths and Opportunities (SO) – Strategies that use strengths to maximize opportunities.	Strengths and Threats (ST) – Strategies that use strengths to minimize threats.
Internal - Weaknesses Negative aspects under your control (to a large extent) which you could plan to improve	Weaknesses and Opportunities (WO) – Strategies that minimize weaknesses by taking advantage of opportunities.	Weaknesses and Threats (WT) – Strategies that minimize weaknesses and avoid threats.

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
1	**INSTITUTIONAL REVIEW**				
1.1	**Water and Sanitation department structure**				
1.1.1	Is there an approved organogram for the Water and Sanitation Department?	There is no approved organogram	**W**		**1**
1.1.2	What is the vacancy rate in the department and is it a problem?	Vacancy rate is very high - about 70% and the current staff is aged people who are not easily trained, all the operational and maintance staff is from the district.	**T**	Advertise and fill the identified critical vacant posts. Engage with the Department of finance to identify and explore possible funding options and budget requirements for the critical posts.	**1**
1.1.3	Does the department have the correct technical skills for the correct posts.	The department is semi skilled it is indeed of technically qualified personnel within the municipality, the municipality is using staff from the DM and there is a service provider working on cost recovery.			
1.1.4	Is training and capacity building being done?	The internal training is offered on adhock basis.	**O**	Institute a mandatory WC/WDM training programme for technical staff. Invest in team building and workshop sessions incorporating the councillors and municipal management to boost staff morale.	
1.1.5	Are there sufficient support structures ito vehicles, equipment, materials etc.?	Some material is kept in stores such as pipes and fittings but spares for pumps and generators are problematic due to procurement issues, material is bought only after the faulty has been reported. Secondly the shortage of vehicles is the serious concern, out of 4 water tankers 2 is broken.	**T**	Institute a mandatory WC/WDM training programme for technical staff. Invest in team building and workshop sessions incorporating the councillors and municipal management to boost staff morale.	**1**
1.1.6	Does the municipality own any water loss control equipment such as loggers, listening sticks, etc.?	No water loss equipment.	**O**	It is recommended that loggers and simple leak detection equipment be purchased to improve water loss monitoring and management in the system.	**2**

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
1.2	**Municipal support**				
1.2.1	Describe the working relationship with other departments such finance, planning, housing etc.?	The relationship with internal finance department is fairly good but it becomes a challenge with the district finance department as they are in charge of procurement, orders are taking long to be approved.	**O**	The positive relationship between these departments should be utilised to improve water loss management. Water sales can be requested on a monthly basis from finance in order to compile and more effectively monitor the NRW.	**2**
1.2.2	Are the politicians supporting the department?	Politicians do support but they need more training on water business.	**O**	Plan a workshop session with the local councillors comprising an introduction to WC/WDM.	**3**
1.3	**Public Private Partnerships**				
1.3.1	Is there any major industrial or institutional role player in the area and is there co-operation? (i.e. Mines or industries that impacts heavily on the municipalities existence)	There is one major role player within Mutale (Tsikondeni Mines)	**O**	Identify any other additional role players through the top consumer monitoring and conduct courtesy visits as a first phase of the programme. Establish a stakeholder forum if practicable and encourage the participation of the big industries in the forum.	**3**
1.3.2	If yes, what does the co-operation involve and can it be expanded?	Tsikondeni Mines is helping the municipality by supplying water to 1 of the villages.	**S**	Improve the existing relationship with the Tsikondeni and expand the initiative to other areas.	**3**
1.4	**Legislation and bylaws**				
1.4.1	Does the municipality have a customer service charter?	No customer service charter in place	**O**	Develop a customer service charter to ensure the customers are aware of the municipalities commitment and their responsibilities as consumers.	**2**
1.4.2	What is the status and age of the existing bylaws and do they address water loss management?	Water bylaws that are used is from the district but the credit control policy is from the LM.	**S**	Periodically review the credit control policy and ensure they encapsulate the latest developments and continue to promote WC/WDM.	**2**
1.4.3	Are bylaws enforced and if not, why not?	Bylaws are enforced e.g.. Water restrictions to all non payers and only provide 200l/day.	**O**		
1.4.4	What is the status and age of Water Services Development Plan?	Only IDP in place.	**S**	Continuously update the IDP on an annual basis.	**1**
2	**FINANCIAL REVIEW**				
2.1	**Financial Department**				
2.1.1	What is your opinion of the Finance Department's ability to perform metering and billing	The billing process is accurate and the municipality is in a process of upgrading the software to make it to be user friendly.	**S**	Improve access to the billing information and utilise the effectiveness of the billing system to monitor and track NRW.	**2**
2.1.2	Is training and capacity building being done?	Training is being done, the service provider has the service agreement to empower the internal staff members and locals.	**O**	Plan a WC/WDM workshop for the finance personnel to facilitate an improved understanding of the technical issues and information requirements.	**1**
2.1.3	What is the state of the municipal metering and billing system?				
2.1.4	What is your primary source of funding?	MIG, internal revenue and funding from the district	**O**	Focus on improving metering and billing of new developments and cost recovery to reduce dependency on grant funding.	**3**
2.2	**Tariffs**				
2.2.1	Who prepares the water tariffs and what is it based on?	Finance department prepares water tariffs and technical has an input.	**O**	Obtain National Treasury tariff guidelines and review tariffs.	**1**

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
2.2.2	What is the tariff structure and does it promote WCWDM?	Flat tariffs is being used at 3.69 per Kl and give 5% discount for air turning the meter	W	Review the current tariff structure. Institute a rising block tariff sufficiently differentiated in cost at each level to promote WC/WDM.	1
2.2.3	Is the water supplied considered affordable by the customers?	Most consumers considers the current tariff as affordable, but in certain areas only few are saying it is expensive.	S	Continue ensuring that the tariffs remain affordable particularly for the efficient and low income water users.	3
2.3	**Meter Reading and Billing**				
2.3.1	Who performs the water meter readings, frequency and accuracy?	The service provider manager all cost recovery programmes.	T	Monitor the frequency and accuracy of meter reading through the customer complaints system.	1
2.3.2	Are the meter readers trained and can they report leakage when encountered on site?	Meter reader are trained and they do report leaks as the walk the streets.	S	Continue providing training for the meter readers on an annual basis particularly on site training based on feedback from the consumers.	3
2.3.3	Is the water bill understandable and informative?	Yes it is informative but it can still improve.	O	Consider including water conservation tips and information in the water bill. It is also recommended to display 6 months graphical consumption data on the bill to aid consumers in effectively monitoring water use.	2
2.4	**Credit control**				
2.4.1	Is credit control being implemented and by whom?	Yes, It is implemented by the service provider	S	Capitalise on the relationship with the councillors and the community and ensure that the areas that are not yet metered are metered and billed to increase revenue water.	3
2.4.2	What is the current level of non-payment?	It has dropped from 60% to 40% and the collection went up to above R200000 in each month.			
3	**SOCIAL REVIEW**				
3.1	**Customer profile**				
3.1.1	Describe the general consumer profile i.e. Income levels, indigence, unemployment, literacy	There is a high level of unemployed within the villages, above 80% of the population is indigents.	O	The existing relationship should be improved on and utilised to increasingly promote water conservation.	2
3.1.2	Describe the relationship between customers and the municipality and reasons?	Relationship is very good and there is only few of the paying consumers that wants the municipality to remove the communal stand pipes.	S	The community awareness must become an annual on-going programme to make an impact. It can be monitored through KAP surveys conducted biannually in order to determine effectiveness and pertinent water services issues.	2
3.2	**Customer awareness**				
3.2.1	Are consumers informed regarding the value of water?	Consumers are informed during the meetings with tribal authorities especially in some villages where there is no water tankers to bring water everyday.	S	Continue informing communities and ensuring that the customer care line is continuously publicised to further encourage reporting of leakage.	2
3.2.2	What is the level of leakage reporting by the community and what method do they use?	Leakages are very high in Masisi due to illegal connections, communities calls the municipality offices to report leaks and also informs tribal authorities and the response rate from the municipality is very slow to repair leaks due to the shortage of transport .	W	Publicise the customer care services through the, tribal authorities and councillors, pamphlets attached to water bills and local media to promote reporting of leakage.	1

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
3.2.3	What are the most prominent consumer behavioural challenges encountered by the municipality?	A very high level of vandalism on boreholes and cables at pump stations	W	The community awareness campaign should be tailored to address these problems. The councillors and tribal authorities should be encouraged to make these issues an agenda at all public metering held in the different wards.	1
3.2.4	Is xeriscaped gardening and rain water harvesting encouraged?	No rain water harvesting taking place.	O	As part of a community awareness campaign, encourage consumers to harvest rain water and utilise it for garden irrigation and cleaning to reduce the demand for potable water.	3
3.2.5	Are radio campaigns, bill board, pamphlets, informative billing used to inform and educate customers?	None			
3.3	**Schools awareness**				
3.3.1	Number of primary and secondary schools?				
3.3.2	Frequency and scope of schools awareness campaigns?	None	O	Establish a relationship with schools. Monitor their consumption on a monthly basis and undertake education and awareness. Huge benefit can be derived from this. The section 21 schools in particular should be visited, monitored and encouraged to fix leakage as the O&M budgets are operated by the school management for this category of schools. Engage with the schools through workshops and promote water conservation in the education sector.	1
3.3.3	Are goals and objectives monitored and controlled?				
3.4	**Customer Care Centre**				
3.4.1	Does the municipality have a CCC and who operates it?				
3.4.2	How and to whom are billing queries referred?				
3.4.3	To whom are the leak reports referred and do consumers have confidence in the reporting system?				

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
4	**TECHNICAL REVIEW**				
4.1	**Measurement and control**				
4.1.1	Is the system input volume measured, monitored and controlled?	Main reservoirs are metered but reservoirs to different areas are 50% metered and the raw water to the purification plant is not metered.	**W**	Due to the frequency of overflowing reservoirs, a telemetry system is recommended to monitor activity at the reservoirs.	**1**
4.1.2	Is the water supply system sectorised into zones and districts?	The system is not sectorised.	**W**	The water supply system must be sectorised into manageable sized areas to allow for improved monitoring.	**1**
4.1.3	Are the supply to the zones and districts metered?				
4.1.4	Is the system monitored through a telemetry system?	The telemetry system is not working anymore.	**W**	Due to the frequency of overflowing reservoirs, a telemetry system is must be replaced or repaired to monitor activity at the reservoirs.	**1**
4.1.5	What is the Frequency and detail of your water balance calculation?				
4.1.6	Are minimum night flows, consumption trends and logging used to monitor the system?	No minimum night flow analysis.	**T**	Obtain and install logging equipment periodically on the bulk meters and conduct MNF analysis to determine leakage levels and areas experiencing high or low pressures.	**1**
4.1.7	Are monthly management reports prepared and key performance indicators measured?	Monthly management reports are not done, only the cost recovery reports are being generated on monthly basis.	**O**	Prepare monthly reports on the NRW KPI's	**2**
4.2	**Physical leakage**				
4.2.1	What is the average age of the network, pipe material, replacement programme?	The network is very old, AC pipes.	**T**	Set aside 5% of the CAPEX budget for the replacement of the network.	**2**
4.2.2	Number of burst pipes reported and repaired per week / month and the average response time?	About 10 pipe bursts per week and the response time can be long due to lack of materials	**T**	The response time of 48hrs must be maintained and continuously improved upon.	**2**
4.2.3	What is the primary cause of burst pipes?	Mainly due to aging network, trees growing over the pipes and high pressures in some areas as well as the poor 350mm uPVC pipe class that was installed in 2007.	**O**	Allocate a proper budget for replacement and refurbishment. Budget a minimum of 5% of the infrastructure value for this purpose to reduce the risk of system failure.	**3**
4.2.4	Are active leak detection programmes conducted?	No leak detection programmes in place.	**W**	Conduct active leak detection bi annually (twice a year) through the existing contractor.	**1**
4.2.5	How often and for how long do reservoirs overflow?	Very often the reservoir overflow because of manual controls, there is someone monitoring reservoir on shift basis for 24hrs.	**O**	Install a real time telemetry system to monitor activity at the reservoirs.	**2**
4.2.6	Are water losses from treatment processes (backwash, etc.) monitored and minimised?				
4.2.7	Is leakage on private properties a problem and if so, why?	Leakages in private properties is a major problem, it is mainly due to leaking toilets and broken taps.	**O**	Undertake a leak audit as part of the community awareness campaign and determine the extent of internal plumbing leakage. Consider repairing leaks on indigent properties to decrease NRW.	**3**
4.2.8	Are leaks on indigent private properties repaired and removal of wasteful devices encouraged?				
4.3	**Pressure management and control valves**				
4.3.1	What is the average and maximum system pressure?	Not sure			
4.3.2	Is basic or advanced pressure management being implemented?	No pressure management in place.	**O**	Install PRV's in critical areas experiencing high pressures and monitor on a monthly basis.	**1**
4.3.3	Are control valves pro-actively being maintained to prevent overflowing reservoirs?	Control valves are maintained once a month and also service some air valves to avoid air locks in the system.	**S**	Existing control valves must be maintained or recommissioned to assist in the monitoring of reservoirs.	**2**

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
4.4	**Consumer metering**				
4.4.1	Are domestic and non-domestic consumers metered and which type of meter is used?	Most consumers are metered +- 6040 now compared to 1000 in 2008 and types of meters are Aqualoc and Kent meters	**O**	Meter and bill 100% of non domestic connections as a priority and increasingly meter and bill the domestic consumers where practicable to increase revenue water.	**2**
4.4.2	What is the condition, age and accuracy of water meters?	Some meters are as old as the town and they may not be accurate.	**O**	Allocate a significant budget and implement a meter replacement programme particularly for bulk and non domestic consumers as a first phase of replacement.	**1**
4.4.3	Are the top consumers pro-actively monitored on a monthly basis?	Top consumers are monitors on monthly basis.	**S**	Maintain monthly monitoring of top non domestic consumers. Undertake a top consumer audit and ensure that all connections are metered and billed.	**1**
4.4.4	Describe the water quality and its impact on consumer water meters?	Water quality is fairly good though in some boreholes in Niani is salty.			
4.4.5	What is the prevalence and control of illegal connections?	In Masisi and surrounding areas fines are given to people who are connecting illegally.	**O**	Undertake an illegal connection removal programme. Consider an amnesty programme where consumers with unlawful connections can come forward and report without prosecution.	**1**
4.5	**Management information**				
4.5.1	Does the Municipality have an asset register and asset management programme?	The asset register is with the district office.	**W**	Obtain an electronic asset management programme and institute an asset management programme. Utilise indigent community members to locate and clean the municipal infrastructure.	**2**
4.5.2	What is the status and age of as-built drawings?	There are no as built drawings.	**T**	Develop digital copies of the remainder of the network.	**2**

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
Summary					

SWOT Analysis	Helpful	Harmful
Internal factors (Staff, infrastructure, tools, equipment)	Credit control Visible leaks are reported and fixed Indigent consumer use is controlled	Training and capacity building in WDM section No water loss equipment Positions are not filled Electronic asset register required for engineering purposes Limited asset management programme Develop schools awareness campaign Limited water resources No approved organogram Limited water supply to the villages Not enough water tankers
Internal factors (Politics, finance, consumers, economics)	Good relationship with finance but can improve Supportive politicians and tribal authorities Community appreciate value of water Water tariffs do support WCWDM Review water tariffs to cover costs Review charters, policies and bylaws to promote WDM	Improved metering and billing required High indigent consumer base

WCWDM STRATEGY : Quantitative Scorecard

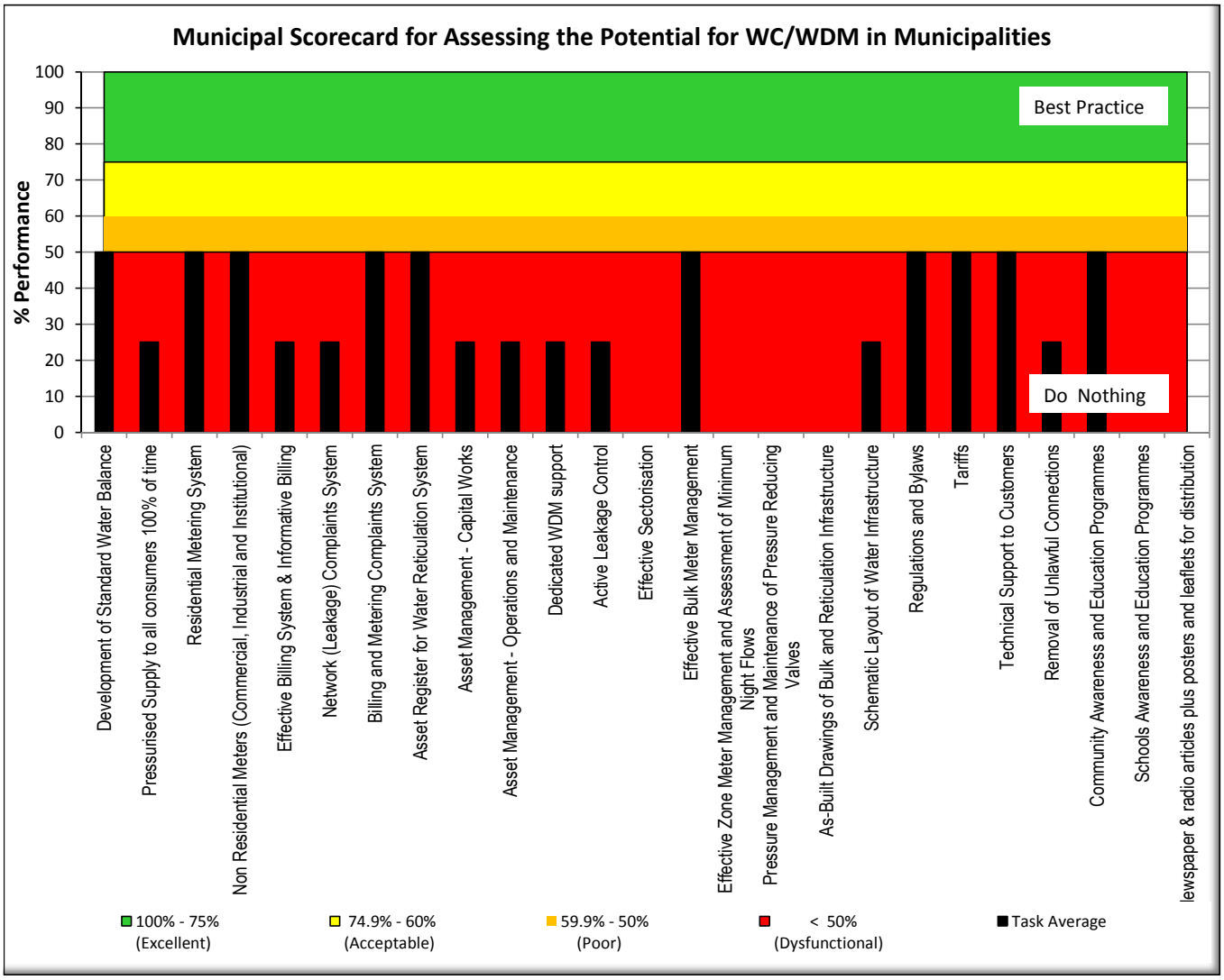
Municipality Name	Mutale

Introduction

The purpose of the Water Conservation / Water Demand Management (WC/WDM) Scorecard is to ascertain the status quo of WC/WDM and evaluate the potential for WC/WDM measures to be implemented in these systems. The scorecard is also designed to enable the Regulator (Department of Water Affairs) to assess the current situation regarding losses and levels of wastage in all water supply systems countrywide. The scorecard consists of 25 multiple choice questions with each question getting scored from 0 to 4. The Regulator and WSA can track progress with each year the scorecard gets completed. Each question ends with an audit requirement which indicates what will be required by the Regulator should the questionnaire be audited. It also provides an indication on what is required in terms of each of the measures.

Completed by					
Date		Feb-12			Average
1. Development of Standard Water Balance		2			2
2. Pressurised supply to all consumers 100% of time		1			1
3. Residential Metering System		2			2
4. Non Residential Meters (Commercial, Industrial and Institutional)		2			2
5. Effective Billing System & Informative Billing		1			1
6. Network (Leakage) Complaints System		1			1
7. Billing and Metering Complaints System		2			2
8. Asset Register for Water Reticulation System		2			2
9. Asset Management - Capital Works		1			1
10. Asset Management - Operations and Maintenance		1			1
11. Dedicated WDM support		1			1
12. Active Leakage Control		1			1
13. Effective Sectorisation		0			0
14. Effective Bulk Meter Management		2			2
15. Effective Zone Meter Management and Night Flow Analysis		0			0
16. Pressure Management and Maintenance of Pressure Reducing Valves		0			0
17. As-Built Drawings of Bulk and Reticulation Infrastructure		0			0
18. Schematic Layout of Water Infrastructure		1			1

Date		Feb-12			Average
19. Regulations and Bylaws		2			2
20. Tariffs		2			2
21. Technical Support to Customers		2			2
22. Removal of Unlawful Connections		1			1
23. Community Awareness and Education Programmes		2			2
24. Schools Awareness and Education Programmes		0			0
25. Newspaper & radio articles plus posters and leaflets for distribution		0			0
Total score (maximum 100)			0	0	29



WCWDM STRATEGY AND BUSINESS PLAN : BUDGET AND CASH FLOW

Municipality name	Mutale

COSTS

Item		Unit	Quantity / year	Rate	Year 1	Year 2	Year 3	Year 4	Year 5	Total
INSTITUTIONAL / LEGISLATIVE INTERVENTIONS										
Institutional review:					100%					100%
CAPEX	Review organogram and fill vacancies	Sum	1	R 200 000	R 200 000	R 0	R 0	R 0	R 0	R 200 000
OPEX		Sum			R 0	R 0	R 0	R 0	R 0	R 0
Training and education :					50%	50%				100%
CAPEX	Not applicable	No		R 0	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Assume one training course / employee / annum	No	10	R 5 000	R 50 000	R 50 000	R 50 000	R 50 000	R 50 000	R 250 000
Customer charter, policy, bylaws :							100%			100%
CAPEX	Review bylaws on 5 year cycles	Sum	1	R 200 000	R 0	R 0	R 200 000	R 0	R 0	R 200 000
OPEX	Enforce bylaws	Sum	1	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 500 000
FINANCIAL INTERVENTIONS										
Effective metering and billing :					50%	50%				100%
CAPEX	Perform meter audit	No		R 0	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Ensure proper metering and billing of all consumers	No	24 239	R 100	R 2 423 900	R 2 423 900	R 2 423 900	R 2 423 900	R 2 423 900	R 12 119 500
Water tariffs :					50%		50%			100%
CAPEX	Review water tariffs	Sum	1	R 200 000	R 100 000	R 0	R 100 000	R 0	R 0	R 200 000
OPEX	Not applicable	Sum		R 0	R 0	R 0	R 0	R 0	R 0	R 0
Informative billing :					50%	50%				100%
CAPEX	Improve invoice to show monthly consumption	Sum	1	R 200 000	R 100 000	R 100 000	R 0	R 0	R 0	R 200 000
OPEX	Distribute information with bill	Sum	24 239	R 120	R 2 908 680	R 2 908 680	R 2 908 680	R 2 908 680	R 2 908 680	R 14 543 400
SOCIAL INTERVENTIONS										
Consumer Awareness Campaign :					20%	20%	20%	20%	20%	100%
CAPEX	Install bill boards, design pamphlets, radio campaigns	Sum	24 239	R 120	R 581 736	R 581 736	R 581 736	R 581 736	R 581 736	R 2 908 680
OPEX	Target households on monthly basis with awareness cam	No	24 239	R 60	R 1 454 340	R 1 454 340	R 1 454 340	R 1 454 340	R 1 454 340	R 7 271 700
Consumer Help and Support Desk :					100%					100%
CAPEX	Improve existing help-desk to provide one-stop service	Sum	1	R 200 000	R 200 000	R 0	R 0	R 0	R 0	R 200 000
OPEX	Maintain help-desk	Sum	1	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 500 000
Schools awareness :					20%	20%	20%	20%	20%	100%
CAPEX	Prepare schools competition, awareness, retrofit	No	463	R 20 000	R 1 852 000	R 1 852 000	R 1 852 000	R 1 852 000	R 1 852 000	R 9 260 000
OPEX	Monthly schools awareness campaign	No	463	R 2 000	R 926 000	R 926 000	R 926 000	R 926 000	R 926 000	R 4 630 000

TECHNICAL INTERVENTIONS										
Bulk metering :					50%	50%				100%
CAPEX	New meter installations required	No		R 50 000	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Maintenance of existing bulk meters	No		R 1 000	R 0	R 0	R 0	R 0	R 0	R 0
Sectorisation :					50%	50%				100%
CAPEX	Setup of new DMA / PMAs	No		R 50 000	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Maintenance of DMA / PMAs including step testing	No		R 25 000	R 0	R 0	R 0	R 0	R 0	R 0
Active Leakage Control :					50%	50%				100%
CAPEX	Not applicable	No		R 0	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Fix all visible and reported leaks	No	420	R 1 000	R 420 000	R 420 000	R 420 000	R 420 000	R 420 000	R 2 100 000
Valve audits					20%	20%	20%	20%	20%	100%
CAPEX	Locate, clean, repair, document network valves	No	1 680	R 4 000	R 1 344 000	R 1 344 000	R 1 344 000	R 1 344 000	R 1 344 000	R 6 720 000
OPEX	Maintain network valves	No	336	R 1 000	R 336 000	R 336 000	R 336 000	R 336 000	R 336 000	R 1 680 000
Leak and logging equipment :					25%	25%	25%	25%		100%
CAPEX	Procure basic WDM equipment	Sum	2	R 20 000	R 10 000	R 10 000	R 10 000	R 10 000	R 0	R 40 000
OPEX	Not applicable	Sum			R 0	R 0	R 0	R 0	R 0	R 0
Telemetry :						50%	50%			100%
CAPEX	Install telemetry sites	No		R 15 000	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Maintain telemetry sites	No		R 1 500	R 0	R 0	R 0	R 0	R 0	R 0
Retrofitting and removal of wasteful devices :					20%	20%	20%	20%	20%	100%
CAPEX	Retrofit government buildings, schools, etc.	No	2 424	R 1 000	R 484 780	R 484 780	R 484 780	R 484 780	R 484 780	R 2 423 900
OPEX	Not applicable	No		R 0	R 0	R 0	R 0	R 0	R 0	R 0
Mains replacement :					20%	20%	20%	20%	20%	100%
CAPEX	Replace critical leaking mains	km	8.4	R 100 000	R 168 000	R 168 000	R 168 000	R 168 000	R 168 000	R 840 000
OPEX	Not applicable	km		R 0	R 0	R 0	R 0	R 0	R 0	R 0
Pressure management :					50%	50%				100%
CAPEX	New pressure management installations	No	3	R 75 000	R 112 500	R 112 500	R 0	R 0	R 0	R 225 000
OPEX	Maintain pressure management installations	No	6	R 5 000	R 30 000	R 30 000	R 30 000	R 30 000	R 30 000	R 150 000
Control valve management :					50%	50%				100%
CAPEX	New control valve installations	No		R 0	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Maintain all control valve installations	No		R 5 000	R 0	R 0	R 0	R 0	R 0	R 0
Consumer metering :					20%	20%	20%	20%	20%	100%
CAPEX	Replacement of old water meters	No	2 424	R 1 200	R 581 736	R 581 736	R 581 736	R 581 736	R 581 736	R 2 908 680
OPEX	Replacement of broken and cycled water meters	No	1 212	R 1 200	R 1 454 340	R 1 454 340	R 1 454 340	R 1 454 340	R 1 454 340	R 7 271 700
Top consumer audit :					20%	20%	20%	20%	20%	100%
CAPEX	Audit and retrofit non domestic consumers	No	1 212	R 10 000	R 2 423 900	R 2 423 900	R 2 423 900	R 2 423 900	R 2 423 900	R 12 119 500
OPEX	Maintain non domestic consumers installations	No	1 212	R 500	R 606 000	R 606 000	R 606 000	R 606 000	R 606 000	R 3 030 000
GIS / CAD system :					50%	50%				100%
CAPEX	Setup CAD/ GIS system	Sum	1	R 200 000	R 100 000	R 100 000	R 0	R 0	R 0	R 200 000
OPEX	Maintain CAD / GIS system	Sum	1	R 200 000	R 200 000	R 200 000	R 200 000	R 200 000	R 200 000	R 1 000 000
Management Information System :					50%	50%				100%

CAPEX	Setup basic MIS system to support WDM	Sum	1	R 200 000	R 100 000	R 100 000	R 0	R 0	R 0	R 200 000
OPEX	Maintain MIS system	Sum	1	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 500 000
Water loss monitoring and audits:					100%					100%
CAPEX	Perform proper analysis of distribution network	Sum	1	R 200 000	R 200 000	R 0	R 0	R 0	R 0	R 200 000
OPEX	Perform ad hoc analysis to monitor interventions	Sum	1	R 20 000	R 20 000	R 20 000	R 20 000	R 20 000	R 20 000	R 100 000

Item	Type			Year 1	Year 2	Year 3	Year 4	Year 5	Total
TOTAL COSTS									
Institutional	CAPEX			R 200 000	R 0	R 200 000	R 0	R 0	R 400 000
	OPEX			R 150 000	R 150 000	R 150 000	R 150 000	R 150 000	R 750 000
	TOTAL			**R 350 000**	**R 150 000**	**R 350 000**	**R 150 000**	**R 150 000**	**R 1 150 000**
Financial	CAPEX			R 200 000	R 100 000	R 100 000	R 0	R 0	R 400 000
	OPEX			R 5 332 580	R 5 332 580	R 5 332 580	R 5 332 580	R 5 332 580	R 26 662 900
	TOTAL			**R 5 532 580**	**R 5 432 580**	**R 5 432 580**	**R 5 332 580**	**R 5 332 580**	**R 27 062 900**
Social	CAPEX			R 2 633 736	R 2 433 736	R 2 433 736	R 2 433 736	R 2 433 736	R 12 368 680
	OPEX			R 2 480 340	R 2 480 340	R 2 480 340	R 2 480 340	R 2 480 340	R 12 401 700
	TOTAL			**R 5 114 076**	**R 4 914 076**	**R 4 914 076**	**R 4 914 076**	**R 4 914 076**	**R 24 770 380**
Technical	CAPEX			R 5 524 916	R 5 324 916	R 5 012 416	R 5 012 416	R 5 002 416	R 25 877 080
	OPEX			R 3 166 340	R 3 166 340	R 3 166 340	R 3 166 340	R 3 166 340	R 15 831 700
	TOTAL			**R 8 691 256**	**R 8 491 256**	**R 8 178 756**	**R 8 178 756**	**R 8 168 756**	**R 41 708 780**
Total	CAPEX			R 8 558 652	R 7 858 652	R 7 746 152	R 7 446 152	R 7 436 152	R 39 045 760
	OPEX			R 11 129 260	R 11 129 260	R 11 129 260	R 11 129 260	R 11 129 260	R 55 646 300
	TOTAL			**R 19 687 912**	**R 18 987 912**	**R 18 875 412**	**R 18 575 412**	**R 18 565 412**	**R 94 692 060**
				R 19 687 912	R 18 987 912	R 18 875 412	R 18 575 412	R 18 565 412	

BENEFITS

Item	Unit			Year 1	Year 2	Year 3	Year 4	Year 5	Total
CHANGE IN CONSUMPTION									
Reduced input volume				20%	40%	60%	80%	100%	300%
Volume	m^3/annum	3 369 351		673 870	1 347 741	2 021 611	2 695 481	3 369 351	10 108 054
Amount	R / annum	3 369 351	R 3.50	R 2 358 546	R 4 717 092	R 7 075 638	R 9 434 184	R 11 792 730	R 35 378 189
Increased revenue water				20%	40%	60%	80%	100%	300%
Volume	m^3/annum	169 989		33 998	67 996	101 994	135 992	169 989	509 968
Amount	R / annum	169 989	R 7.00	R 237 985	R 475 970	R 713 955	R 951 941	R 1 189 926	R 3 569 777
Total	**R / annum**			**R 2 596 531**	**R 5 193 062**	**R 7 789 593**	**R 10 386 124**	**R 12 982 655**	**R 38 947 966**

Payback period - years **2.4**

WC/WDM Projection summary and targets

Municipality name	Mutale

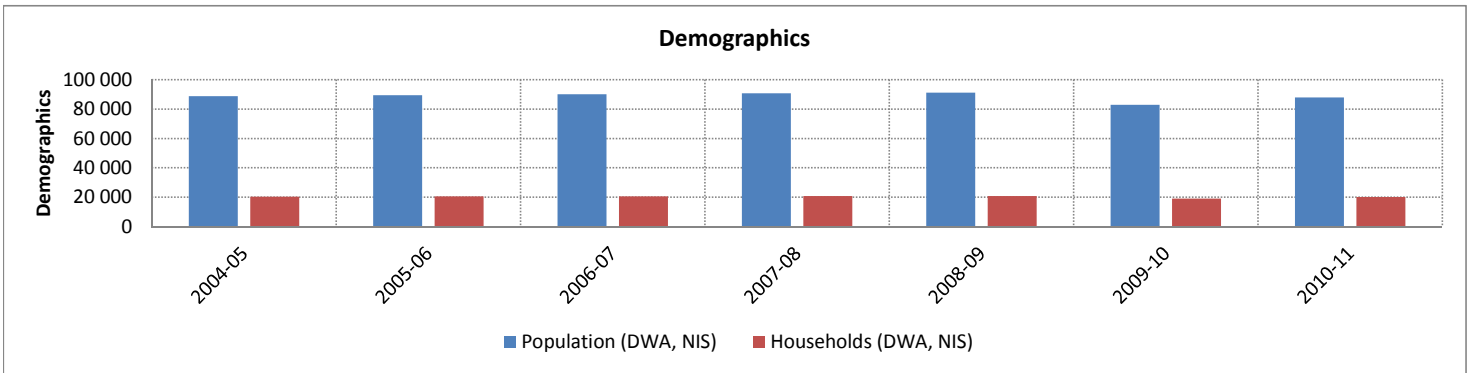
Water Demand projection	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Less 10.0% WDM Scenario							9.47	9.40	9.33	9.26	9.19	9.11
Less 15.0% WDM Scenario							9.39	9.24	9.09	8.93	8.77	8.60
Less 20.0% WDM Scenario							9.31	9.08	8.84	8.60	8.35	8.10
Actual Demand	2.70	2.72	2.74	2.76	2.78	2.21	2.34	9.63				
High population No WDM							9.63	9.73	9.82	9.92	10.02	10.12
Current yield	9.63	9.63	9.63	9.63	9.63	9.63	9.63	9.63	9.63	9.63	9.63	9.63

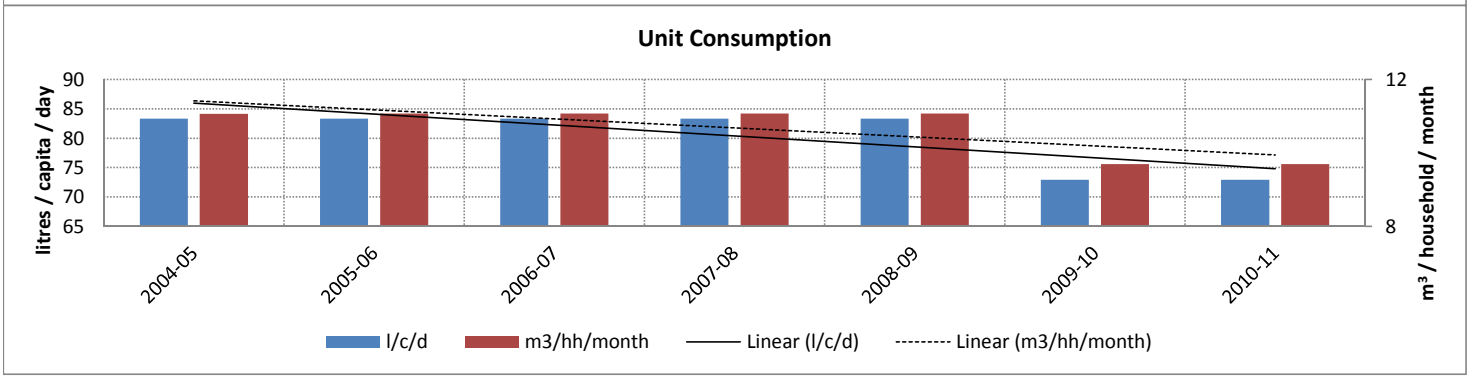
Savings	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Less 10.0% WDM Scenario							0.16	0.32	0.49	0.66	0.84	1.01
Less 15.0% WDM Scenario							0.24	0.49	0.74	0.99	1.25	1.52
Less 20.0% WDM Scenario							0.32	0.65	0.98	1.32	1.67	2.02
Actual savings							7.29					

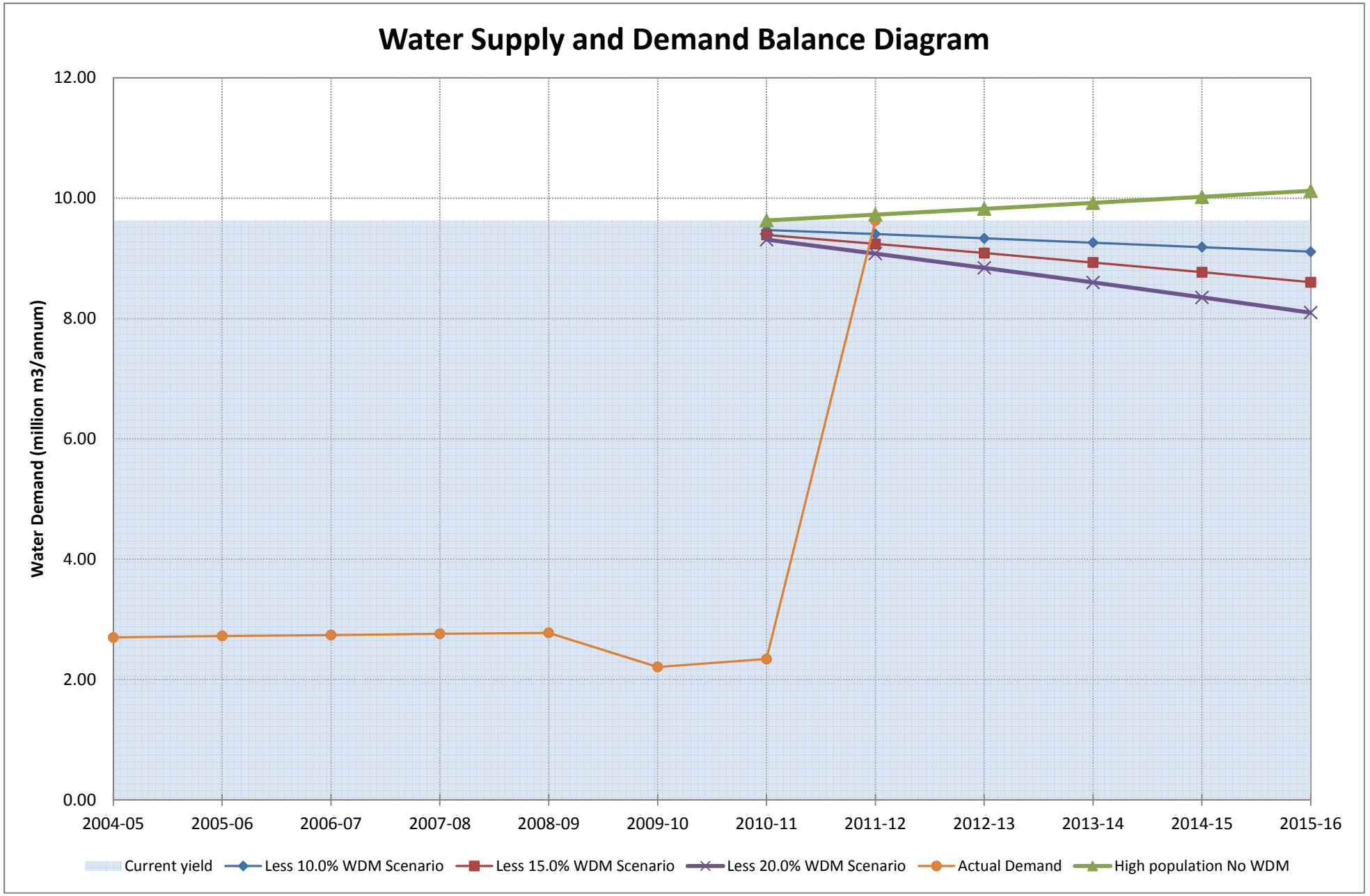
% Reduction	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Less 10.0% WDM Scenario							1.67%	3.33%	5.00%	6.67%	8.33%	10.00%
Less 15.0% WDM Scenario							2.50%	5.00%	7.50%	10.00%	12.50%	15.00%
Less 20.0% WDM Scenario							3.33%	6.67%	10.00%	13.33%	16.67%	20.00%

Year / Year % Growth	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Less 10.0% WDM Scenario								-0.7%	-0.7%	-0.8%	-1.6%	-1.6%
Less 15.0% WDM Scenario								-1.6%	-1.7%	-1.7%	-3.5%	-3.7%
Less 20.0% WDM Scenario								-2.5%	-2.6%	-2.7%	-5.5%	-5.8%
Actual Demand		0.9%	0.6%	0.7%	0.6%	-20.5%	6.0%					
High population No WDM								1.0%	1.0%	1.0%	1.0%	1.0%

Key Performance Indicators	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Population (DWA, NIS)	88 733	89 503	90 038	90 710	91 249	82 954	87 931					
Households (DWA, NIS)	20 328	20 500	20 612	20 775	20 890	18 989	20 128					
l/c/d	83	83	83	83	83	73	73					
m3/hh/month	11	11	11	11	11	10	10					
Demand Ml/day	7	7	8	8	8	6	6					






Water Supply and Demand Balance Diagram
Water Demand (million m3/annum)
12.00
10.00
8.00
6.00
4.00
2.00
0.00
2004-05
2005-06
2006-07
2007-08
2008-09
2009-10
2010-11
2011-12
2012-13
2013-14
2014-15
2015-16
Current yield
Less 10.0% WDM Scenario
Less 15.0% WDM Scenario
Less 20.0% WDM Scenario
Actual Demand
High population No WDM

WCWDM STRATEGY : RPMS Compliance

Municipality name	Mutale

Key questions from the Regulatory Performance Measurement System (RPMS) related to WC/WDM

KPI		ID	WSA Value
KPI 1 – Access to Water			
KPI 2 – Access to Sanitation			
KPI 3 – Access to Free Basic Water			
	Total poor households receiving Free Basic Water for last financial year	ID:012	
	Total poor households	ID:013	
KPI 4 – Access to Free Basic Sanitation			
	Total poor households receiving Free Basic Sanitation for last financial year	ID:014	
	Total poor households	ID:013	
KPI 5 – Drinking Water Quality			
KPI 6 –Wastewater Quality			
KPI 7 - Customer Services Standards			
Component 1 – Service Interruptions			
	Total number of Service interruptions in the last financial year	ID:034	
	Number of interruptions in continuous service to consumers, where interruption for a single incident was greater than 24h	ID:033	
Component 2 – CRM Systems			
	Does the WSA have a customer Charter	ID:036	
	Does the WSA have a customer service centre	ID:035	
	Is there a system to manage customer queries and log faults	ID:038	
	Does the incident tracking system escalate complaints if not responded to within a prescribed time?	ID:037	
KPI 8 - Institutional Effectiveness			
Component 1 - Institutional Effectiveness			
	Completed WSDP is approved by Council for the last financial year?	ID:039	
	Required policies are in place and approved by Council?	ID:040	
	Required bylaws are in place and approved by Council?	ID:041	
	Contracts and Service level agreements in place with all appropriate service delivery role-players (WSPs, internal etc.)	ID:042	
	The WSA monitors the KPIs defined by the contract or SLA?	ID:043	
Component 2 - Water Services Staff Effectiveness			
	Total Water Services staff costs for the last financial year	ID:045	
	Total cost of water and sanitation provision for the last financial year including interest and depreciation (expenditure)	ID:046	
	Total budgeted for water services staff according to the approved organogram for the last financial year	ID:078	
Component 3 - Grant Funding Effectiveness			
	Total grant funding allocation received for the last financial year	ID:048	
	Total grant funding allocation spent for the last financial year	ID:047	
Component 4 - WSA Annual Report			
	WSA annual report submitted to Minister	ID:077	
Component 5 - % Filled Posts on Organogram			
	Total number of posts on Council-approved organogram for the last financial year for water services staff	ID:080	
	Total number of posts filled on the approved water services organogram in the last financial year	ID:079	

KPI 9 - Financial Performance			
Component 1 – Financial Integrity			
	Is WSA ring-fenced? (Separate legal entity=3, Separate accounting entity=2, Partially ring-fenced=1, Not ring-fenced at all=0)	ID:049	
	Audit report evaluation. (Unqualified=4, Qualified=3, Adverse=2, Disclaimer=1, No report=0)	ID:050	
Component 2 – Average Debtor Days			
	Water Services sales income for the last financial year (water/sanitation)	ID:052	
	Total outstanding customer/consumer debt for water and sanitation for the last financial year	ID:051	
Component 3 – Revenue Collection Effectiveness			
	Water Services sales income for the last financial year (water/sanitation)	ID:052	
	Water Services billed income actually received from consumers for last financial year	ID:053	
Component 4 – Average Creditor Days			
	Total bulk water purchases for the last financial year	ID:055	
	Total bulk water accounts outstanding for the last financial year	ID:054	
Component 5 – Financial Sustainability			
	Total water and sanitation income for the last financial year	ID:056	
	Total cost of water and sanitation provision for the last financial year including interest and depreciation (expenditure)	ID:046	
Component 6 – Financial Effectiveness			
	Total outstanding customer/consumer debt (after provisions) for water and sanitation for the last financial year	ID:051	
	Total provision for doubtful debt for water and sanitation for the last financial year	ID:082	
KPI 10 Strategic Asset Management			
Component 1 - Capital Spent on Rehabilitation and Replacement			
	Total capital budget (Water and Sanitation) in the last financial year	ID:063	
	Total capital spent on refurbishment and replacement in the last financial year	ID:062	
Component 2 –Asset Management Effectiveness			
	Asset management plan status	ID:057	
	Asset register status	ID:058	
	Asset management system is electronic	ID:059	
Component 3 – O&M Expenditure			
	Total spent on O&M/Annual maintenance cost (Water and Sanitation) in the last financial year	ID:060	
	Replacement value of assets (water services infrastructure)	ID:061	
Component 4 – Replacement Saving			
	Depreciation value for the last financial year (Water and Sanitation infrastructure)	ID:065	
	Contribution to asset replacement fund for the last financial year. (Water and Sanitation)	ID:064	
Component 5 – Asset Register Monitoring			
	Asset register field monitored: Date acquired	ID:066	
	Asset register field monitored: Estimated remaining life of asset	ID:068	
	Asset register field monitored: Replacement value of asset	ID:070	
	Asset register field monitored: Purchase cost of asset	ID:069	
	Asset register field monitored: Description of asset (Yes/No)	ID:067	
KPI 11 Water Demand Management			
	System input volume (external sources) for the last financial year	ID:121	
	System input volume (own sources) for the last financial year	ID:122	
	Total billed metered water consumption (volume) for the last financial year	ID:071	
	Total billed unmetered water consumption (volume) for the last financial year	ID:074	
	Total unbilled metered water consumption (volume) for the last financial year	ID: 073	
	Total unbilled unmetered water consumption (volume) for the last financial year	ID: 123	
ADDITIONAL QUESTIONS FOR WATER USE EFFICIENCY			

	Water Conservation and Water Demand Management plan		
	Installation of water efficient devices		
	Repair of leaks		
	Measurement or control of water supplied		
	Pressure management		
Additional KPI : Tariff Data			
	Which of the listed elements are taken into account when you determine your tariff? Indicate from the list provided	ID: 201	
	Total amount of subsidies allocated to water for the next financial year	ID: 202	
	Total projected cost of water provision for the next financial year	ID: 203	
	Does your tariff recognise the difference between levels of service (according to Regulation 4 under s10 of the Water Services Act)?	ID: 204	
	Does your tariff recognise the difference between socio-economic status of customers (according to s10 of the Water Services Act)?	ID: 205	
	Do you charge a rising block tariff?	ID: 206	
	How many blocks are in your tariff structure?	ID: 207	
	What is your approved standard tariff? (Basic levy)	ID: 208	
	What are the actual 2010/2011 tariffs for the following consumer categories?	ID: 209	
	Do you reflect your tariff structure on your bill?	ID: 210	
	What are the quantities of water supplied to the following consumer categories (annually)?	ID: 211	
	What is the unit number of consumers served with water in each consumer category?	ID: 212	
	Do you have a seasonal tariff in your WSA?	ID: 213	
	Does your tariff include a fixed charge?	ID: 214	
	If a fixed charge is levied, do you subsidise the FBW?	ID: 215	
	What other sources of water services revenue (other than tariffs) does your WSA have? Indicate sources on the list provided	ID: 216	
	Total annual water services surplus / deficit	ID: 217	

water affairs

Department:
Water Affairs
REPUBLIC OF SOUTH AFRICA

Department of Water Affairs

Water Demand Management Strategy and Business Plan

for Thulamela Local Municipality

May 2013

WCWDM STRATEGY AND BUSINESS PLAN: Signature Page

Title :	**Development of a Water Conservation and Water Demand Management Strategy and Business Plan for Thulamela Local Municipality**			
Authors :	**WA Wegelin, Z Siqalaba, N Zondo**			
Study Name:	**Development of a First Order Water Conservation and Water Demand Management Strategy and Business Plan for Various Municipalities under the DWA Luvuvhu Letaba Programme : Limpopo Province**			
Status of Report :				
Consultants :	**WRP Consulting Engineers (Pty) Ltd**			
Approved for Consultants :	Study leader	WA Wegelin, PrEng		
	Position	**Name**	**Signature**	**Date**
Municipality	**Thulamela**			
Approved for municipality :	Municipal Manager			
	Position	**Name**	**Signature**	**Date**
Department of Water Affairs	**Limpopo Region**			
Approved for Regional Office :				
	Position	**Name**	**Signature**	**Date**
Department of Water Affairs	**Head Office**			
Approved for Head Office				
	Position	**Name**	**Signature**	**Date**

WCWDM STRATEGY AND BUSINESS PLAN: Contact details

Province	**Limpopo**		**No**
Municipal Code	**LIM343**		**B4**
District Municipality	**Vhembe**		
Municipality	**Thulamela**		
Settlements	**Malamulele, Mavambe, Mhinga, Musvane, Thohoyandou**		

Information provided by			
Date			
Contact person	Erick Muneri		
Position	Manager (Water Services)		
Telephone	015 962 7625	083 457 2205	
E-mail	'munerime@webmail.co.za'		
Study team contact			
Company	WRP Consulting Engineers		
Address	PO Box 1522, Brooklyn Square, 0075		
Contact person	Mr Willem Wegelin		
Telephone number	012 346 3496	**Cell number**	083 4477 999
E-mail	willemw@wrp.co.za		

Water Affairs contact			
Directorate	Water Use Efficiency		
Address	Private Bag X313, Pretoria, 0001		
Contact person	Koena Given Moabelo		
Telephone number	012 336 8174	**Cell number**	082 653 9216
E-mail	MoabeloK@dwa.gov.za		

Water Balance Data Confidence Level (see legend below)	
Input volume	Estimated values
Authorised consumption (Engineering functions)	Estimated values
Meter reading and billing (Finance functions)	Estimated values
Legend	
High level of accuracy	Calibrated bulk meters, >98% of consumers are metered < 10 years old, <2% billing complaints
Medium level of accuracy	Functional bulk meters, >90% of consumers are metered, <10% billing complaints
Low level of accuracy	Some functional bulk meters, >50% consumer meters, any age, meter reading & billing dysfunctional
Estimated values	No bulk or consumer meter readings, best estimate of water consumption
No data	No data and no idea of water consumption

WCWDM STRATEGY AND BUSINESS PLAN: Executive Summary

Province	Limpopo	WSA	No
Municipal Code	LIM343	Category	B4
District Municipality	Vhembe		
Municipality	Thulamela		
Settlements	MAKWARELA, SHAYANDIMA, THOHOYANDOU		

Executive summary

Status quo

Limited WCWDM activities are undertaken in the WSP and there is little management information available to perform a proper assessment of the water losses and potential savings. The assessment is inline with RPMS, Drop assessments and the WSDP.
Most of the towns are informal with formal infrastructure in a relatively smaller area within the municipality which enables limited metering, billing and cost recovery in the WSP. The current metering, billing and cost recovery systems are inadequate.
The engineering departments in the Local Municipalities are characterised by high vacancies and low capacity and skills.
The current estimated unit consumption of 182 l/c/d is acceptable but limited further reduction is expected as it will go towards improved LOS and redistribution.
The relationship with the community is generally positive and the communities themselves are characterised by high unemployment and a large indigent population. The water tariffs do not promote WCWDM and is not cost reflective and consumers do not value water very much.

Strategy

The municipality should focus on proper recording keeping, analysis and development of detailed management information. All vacancies must be filled as a matter of priority together with skills transfer and capacity building. The engineering and finance department must work closer together to improve metering, billing and cost recovery and start with a meter audit to resolve the high NRW. A steering committee should be setup to report on a monthly basis to council on water loss figures, leaks repaired, targets, progress, consumer metering, billing and cost recovery.
Proper metering, billing and cost recovery should be supported by community awareness that promotes reporting of leaks, fixing of private leaks and efficient use. Based on the estimated available information, a target reduction in NRW of 60.2% down to 50.1% and target input volume reduction of 5% have been set. The water tariff structure does not promote WCWDM and is not based on a proper analysis. The municipality should work towards RPMS compliance and improvement of their IDP.

Business Plan

The budget requirements for the next five years are summarised in the table below:

Intervention	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Institutional	400 000	200 000	400 000	200 000	200 000	1 400 000
Financial	31 379 280	31 279 280	31 279 280	31 179 280	31 179 280	156 296 400
Social	13 404 816	13 204 816	13 204 816	13 204 816	13 204 816	66 224 080
Technical	47 668 776	47 618 776	47 093 776	46 943 776	46 933 776	236 258 880
Total	**92 852 872**	**92 302 872**	**91 977 872**	**91 527 872**	**91 517 872**	**460 179 360**

Compliance

Results from the Regulatory Performance Measurement System (RPMS)

Key Performance Indicators	Achieved KPI Score	Required score	Performance assessment
KPI 1: Access to water supply [Overall KPI compliance score]	1.87	3	
KPI 2: Access to sanitation [Overall KPI compliance score]	3.113	3	Adequate
KPI 3: Access to Free Basic Water [Overall KPI compliance score]	5	3	
KPI 4: Access to Free Basic Sanitation [Overall KPI compliance score]	0	3	
KPI 5: Drinking Water Quality management [Overall KPI compliance score]	1	3	
KPI 6: Wastewater quality management [Overall KPI compliance score]	0	3	
KPI 7: Customer service quality [Overall KPI compliance score]	3.5	3	
KPI 8: Institutional effectiveness [Overall KPI compliance score]	3.276	3.5	
KPI 9: Financial performance [Overall KPI compliance score]	0.571	4	
KPI 10: Strategic asset management [Overall KPI compliance score]	3.375	3	Good
KPI 11: Water use efficiency [Overall KPI compliance score]	0	3	

Results from Blue and Green Drop Assessments

Assessment	Year	Microbiological	Chemical	Physical & Organoleptic	Operational	Total
Blue drop	2010	99.30%	99.90%	0.00%	91.25%	78.39%
Green drop	2010	0.00%	0.00%	0.00%	120.00%	20.50%

WCWDM STRATEGY AND BUSINESS PLAN: Municipal Water Conservation and Water Demand Management Implementation Process Map

Strategy and Planning Phase

Performed by WCWDM Strategy Steering Committee (MEC, Municipal Manager, Technical and Financial Directors)
Reviewed by SSC and DWA

Implementation

Performed by Department
Reviewed by SSC and DWA

Monitoring and Review

Performed by Department
Reviewed by SSC and DWA

Vision

Water Services Act, 108 of 1997

Provide water services in an efficient, affordable, equitable, economical and sustainable manner to all consumers or potential consumers in its area of jurisdiction.

BIG HAIRY AND AUDACIOUS VISION
If it doesn't scare you, its not big enough

Mission

Presidential Target
(State of the Nation address 2010)

Reduce water Losses by half by 2014

Status Quo

Technical

Information on demographics, demands, water loss, level of service

Key water loss contributing factors

Key performance indicators and targets

Asset value and condition

Departmental organogram

Economic

Tariffs

Metering, billing and revenue collection status

Existing sources of funding

Social

Customer profile

Communication dynamics between WSA and consumers

Existing support structures for consumers

Level of stakeholder involvement

Institutional

Existence of approved policies

Existence of approved bylaws

Regulatory compliance

Legislative compliance

Strategy

Technical

SWOT Analysis : Strengths, **W**eaknesses, **Opportunities** & **T**hreats of technical department (human resources, processes,
Goals and objectives: Achieving water loss reduction target in terms of available resources and non-revenue water. If no target exists, then goal is to develop a target.
How : Identify key principles to achieve target (user pay, water restrictions, consumer education, etc.)
Actions : Responsible person, measurement and timelines to address SWOT analysis

Economic

SWOT Analysis : Strengths, **W**eaknesses, **Opportunities** and **T**hreats of funding sources
Goals and objectives: Allocate sufficient funding to address WCWDM
How : Identify key principles to obtain funding (improved metering and billing, cost recovery, external funding, etc.)
Actions : Responsible person, measurement and timelines to address SWOT analysis

Social

SWOT Analysis : Strengths, **W**eaknesses, **Opportunities** and **T**hreats of consumers and institution
Goals and objectives: Informed and supportive consumer and institution
How : Identify key principles to develop turn consumers into customers (political, schools, specific consumer groups, water wise, etc.)
Actions : Responsible person, measurements and timelines to address SWOT analysis

Institutional

SWOT Analysis : Strengths, **W**eaknesses, **Opportunities** and **T**hreats of policies, bylaws, political support , enforcement, Regulatory compliance
Goals and objectives: Reform organisation to support WCWDM
How : Identify key principles to obtain improve (improved political support, policies, enforcement, etc.)
Actions : Responsible person, measurement and

Business Plan

Technical

Bulk metering
Leakage control and repair
Sectorisation and zone metering
Logging and water loss monitoring
Non domestic and domestic metering and audits
Resolve intermittent supply
Pressure management
Clean out and recommission existing infrastructure
Training and capacity building

Economic

Review tariff structure
Ensure effective metering and billing system
Review CAPEX budget in terms of WDM goals
Review OPEX budget in terms of WDM goals
Develop business plan for external funding
Training and capacity building

Social

Raise awareness at political levels
Raise awareness at institutional levels
Identify and engage relevant stakeholders
Establish customer care centre
Training and capacity building
Conduct WC/WDM education and awareness
Conduct schools awareness campaigns

Institutional

Establish policies in terms of payment for services, arrears,
Establish bylaws that addresses water loss reduction and efficiency
Succession planning - ensure initiatives continue

Implementation

All Projects

Council approval of Strategy and Business Plan

Identify key stakeholders - setup working committees

Appoint PSP

Appoint contractor

Assess / determine baseline

Implement interventions

Project Quality Control

Project Financial Management

Establish record keeping and reporting processes

Assess benefits from implementation

Establish take-over procedure

Training and capacity building

Deliverables

Technical

Record keeping and reporting process
Monthly IWA Water Balance calculation for system and DMA
No visible leakage
Asset management
Comply with Regulations R509 of 2001
Responsible WCWDM individual/unit

Measurement against goals

Economic

Sufficient budget allocation
Realistic tariff setting
Efficient meter reading, billing and cost recovery process

Measurement against goals

Social

Political support
Institutional support
Informed, involved and supportive consumer

Measurement against goals

Institutional

Approved policies
Approved bylaws
Policy and bylaws enforcement
Regulatory compliance
Succession plan

Measurement aga[illegible]als

Deliverables

Review and update strategy and business plan . Implement and regulate.

Detailed management information

DWA Planning and target setting, Review strategies and Business Plans and align with targets, Possible funding, Technical and Institutional Support, Develop generic Policies and bylaws, Develop Regulations and Regulate, Report to Precedency

WCWDM STRATEGY : Definitions

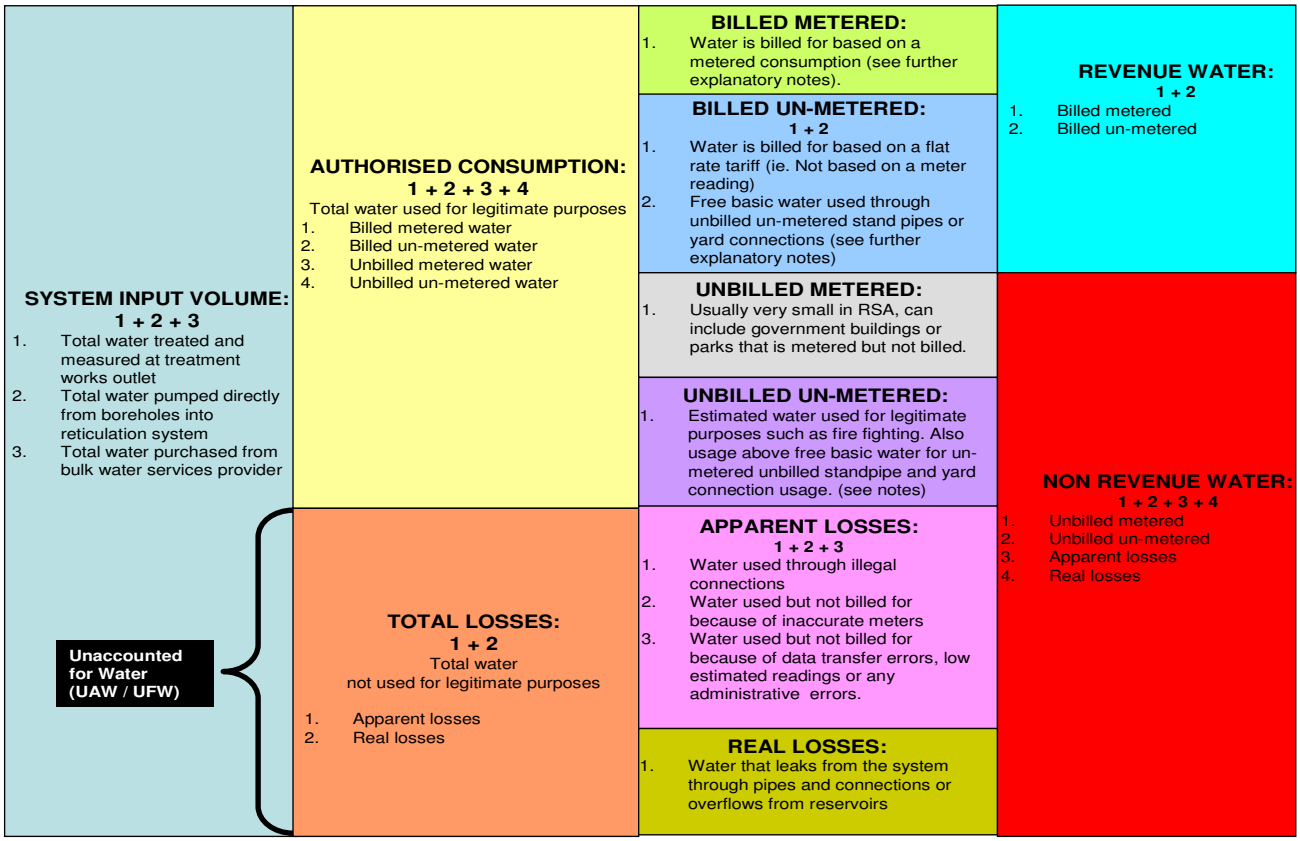
Terminology

Acronym	Description	Link
DWA	Department of Water Affairs	http://www.dwa.gov.za
WS RPMS	Water Services : Regulatory Performance Measurement System	http://www.dwa.gov.za/dir_ws/rpm/
WS NIS	Water Services : National Information System	http://www.dwa.gov.za/dir_ws/wsnis/
FBS	Water Services : Free Basic Water Project	http://www.dwaf.gov.za/dir_ws/fbw/
NRW	Non-revenue water. Volume of water for which no revenue is received (preferred term)	
UAW or UFW	Unaccounted-for water. Volume of water lost due to physical and apparent losses (not preferred term)	
StatsSA NFC	Statistics South Africa : Non-Financial Census of Municipalities P9115	http://www.statssa.gov.za/

Information sources

Item	Source	Calculation
Population	DWA WS NIS or municipality	
Households	DWA WS NIS or municipality	
Connections - metered	Extrapolated 2007 DWA - WS FBW serviced above RDP or municipality	
Connections - Unmetered	Extrapolated 2007 DWA - WS FBW serviced at RDP or municipality	
Length of mains (km)	Actual value or calculated at average of 50 connections / km of mains	# connections ÷ 50
(A) System input volume	Total volume of potable water supplied by the municipality in kl/annum	
(B) Billed metered consumption	Total volume of water metered and billed by the municipality in kl/annum	
(C) Billed unmetered consumption	Total volume of water unmetered and billed by the municipality in kl/annum	
Underlined values	Calculated values using trends or averages	

Standard IWA Water Balance



Apparent Losses

Illegal connections	%	Water Quality	Meter age and accuracy	%	Data transfer	%
Very high	10%	Very poor	> 10 years	10%	Very poor	9%
High	8%	Poor		8%	Poor	7%
Average	6%	Average	5- 10 years	6%	Average	5%
Low	4%	Good		4%	Good	3%
Very low	2%	Very good	< 5 years	2%	Very good	1%

WCWDM STRATEGY : Base Information

Municipality name	Thulamela		Date of current data	2011
		Current	Target	Change
Input Data	**Demographics** IDP Ref			
	Population	**No**	**616 711**	**616 711**	**0**
	Urban	No	616 711	616 711	
	Rural	No			
	Households	**No**	**141 724**	**141 724**	**0**
	Urban	No			
	Rural	No	141 724	141 724	
	Household density	**Pop / HH**	**4.70**	**4.35**	
	Growth rate: 5 years Par 4.1.3	**%**	**2.0%**	**2.0%**	**0**
	Consumer units Par 3.3	**No**	**0**	**0**	**0**
	Residential	No		0	
	Police stations	No		0	
	Magistrates Offices	No		0	
	Business	No		0	
	Dry industries	No		0	
	Office buildings	No		0	
	Prisons	No		0	
	Schools	No		0	
	Health facilities	No		0	
	Wet industries	No		0	
	Household density	**Pop / HH**	**3.3**	**4.4**	
	Property density	**Pop / prop**	**#DIV/0!**	**#DIV/0!**	
	Infrastructure				
	Water Level of Service	**no**	**107 722**	**107 722**	**0**
	Stand pipes	HH	56 862	56 862	0
	Yard connections	HH	50 860	50 860	
	House connections	HH			
	Length of mains (km)	**km**	**2 049.0**	**2 049.0**	**0**
	Connections / km of mains	**No / km**	**52.6**	**52.6**	
	Average system pressure	**m**	**40**	**30**	**-10**
	Time pressurised	**%**	**70%**	**100%**	**0**
	Sanitation Level of Service		**0**	**0**	**0**
	None water borne	No			
	Water borne low flush	No			
	Septic tanks / conservancy	No			
	Water borne - WTW	No			
	Apparent losses	**%**	**17%**	**17%**	**0%**
	Consumer meter age	**%**	**6%**	**6%**	**0%**
	Illegal connections	**%**	**6%**	**6%**	**0%**
	Data transfer	**%**	**5%**	**5%**	**0%**
	Water balance data				
	System input volume	**kℓ/annum**	**41 065 000**	**40 243 700**	**-821 300**
	Own sources	**kℓ/annum**	**21 764 450**	**21 329 161**	**-435 289**
	Other sources	**kℓ/annum**	**19 300 550**	**18 914 539**	**-386 011**
	Billed metered consumption	**kℓ/annum**	**16 326 720**	**20 081 866**	**3 755 146**
	Billed unmetered consumption	**kℓ/annum**			**0**
	Unbilled metered consumption	**kℓ/annum**			**0**
	Unbilled unmetered consumption	**kℓ/annum**			**0**

	Water Tariffs					
	Purchase of bulk water	Par 10.2	R/annum			R 0.00
	Total operating cost		R/annum			R 0.00
	Rate - Purchase of bulk water		R/kℓ	R 0.00	R 0.00	
	Rate - Total operating		R/kℓ	R 0.00	R 0.00	
	Domestic Water Tariffs	Par 10.3				
	0 to		kℓ/month		R 0.00	R 0.00
	to		kℓ/month		R 0.00	R 0.00
	to		kℓ/month		R 0.00	R 0.00
	to		kℓ/month		R 0.00	R 0.00
	to		kℓ/month		R 0.00	R 0.00
	> to		kℓ/month		R 0.00	R 0.00
Water Balance Calculations	System input volume		kℓ/annum	41 065 000	40 243 700	-821 300
	Authorised Consumption		kℓ/annum	16 326 720	20 081 866	3 755 146
	Billed authorised		kℓ/annum	16 326 720	20 081 866	3 755 146
	Billed metered		kℓ/annum	16 326 720	20 081 866	3 755 146
	Billed unmetered		kℓ/annum	0	0	0
	Unbilled authorised		kℓ/annum	0	0	0
	Unbilled metered		kℓ/annum	0	0	0
	Unbilled unmetered		kℓ/annum	0	0	0
	Water losses		kℓ/annum	24 738 280	20 161 834	-4 576 446
	Apparent losses		kℓ/annum	4 205 508	3 427 512	0
	Real losses		kℓ/annum	20 532 772	16 734 323	-4 576 446
	UARL		kℓ/annum	1 257 669	1 347 503	0
	Potential real loss saving		kℓ/annum	19 275 103	15 386 820	-4 576 446
	Revenue water		kℓ/annum	16 326 720	20 081 866	3 755 146
	Non-Revenue water		kℓ/annum	24 738 280	20 161 834	-4 576 446
Key Performance Indicators	System input volume unit consumption					
	litres / capita / day		ℓ / c / d	182	179	-3
	m³ / household / month		m³ / hh / month	24	24	0
	m³ / connection / month		m³ / conn / month	32	31	-1
	Authorised unit consumption					
	litres / capita / day		ℓ / c / d	73	89	16
	m³ / household / month		m³ / hh / month	10	12	2
	m³ / connection / month		m³ / conn / month	13	16	3
	Water loss indicators					
	UARL : Losses / connection / day		ℓ / conn / day	32	34	2
	CARL : Losses / connection / day		ℓ / conn / day	522	426	-97
	Infrastructure Leakage Index (ILI)		-	16.33	12.42	-4
	Losses / km mains / day		m³ / km / day	27.5	22.4	-5
	Non-revenue water		%	60.2%	50.1%	-10.1%
	Unbilled Consumption		%	0.0%	0.0%	0.0%
	Water Losses		%	60.2%	50.1%	-10.1%
	Apparent losses		%	10.2%	8.5%	-1.7%
	Real losses		%	50.0%	41.6%	-8.4%
	Water balance reduction targets					
	System input volume		%		-2.0%	
	Authorised Consumption		%		23.0%	
	Billed authorised		%		23.0%	
	Billed metered		%		23.0%	
	Billed unmetered		%		0.0%	
	Unbilled authorised		%		0.0%	
	Unbilled metered		%		0.0%	
	Unbilled unmetered		%		0.0%	
Cost Analysis	Average monthly water bill / connection		R / conn / month	R 0	R 0	R 0
	Estimated annual income		R / annum	R 0	R 0	R 0
	Total water supply cost		R / annum	R 0	R 0	R 0
	Net profit / loss		R / annum	R 0	R 0	R 0
	Town and description		Source	Ml/day	m^3/annum	million m^3/annum

Water Source and Treatment Capacity	Thulamela LM WTWs	Blue Drop 2011	115.46	42 142 900	42.143
	Makado LM WTWs	Blue Drop 2011	28.25	10 310 155	10.310
	Musina LM	NRW data	12.00	4 380 000	4.380
	Mutale LM	Blue Drop 2011	16.08	5 869 200	5.869
	Total		171.79	62 702 255	62.702

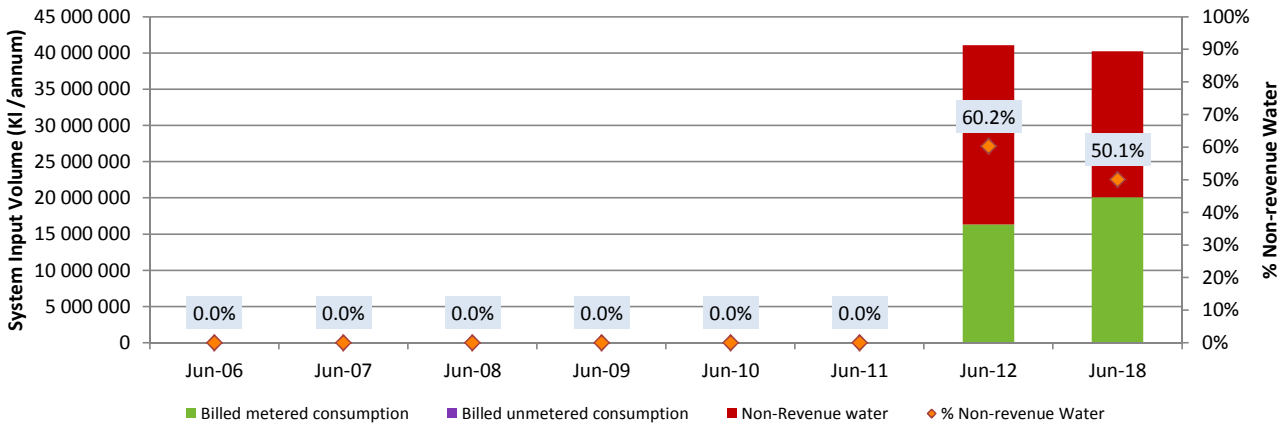
Current IWA Water Balance Diagram (million m^3/annum)

Target IWA Water Balance Diagram (million m^3/annum)

WCWDM STRATEGY : Water Balance History

Municipality Name	Thulamela

			Year ending	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	Jun-11	Jun-12	Jun-18
Input Data		Population		615 020	618 707	623 346	627 094	583 067	619 448	616 711	878 700
		Households		139 844	140 687	141 729	142 584	132 568	140 850	141 724	199 798
		Connections - metered		68 362	68 771	69 287	69 704	64 810	68 854	68 941	97 670
		Connections - Unmetered		39 718	39 957	40 253	40 496	37 651	40 003	40 054	56 745
		Length of mains (km)		2 162	2 175	2 191	2 204	2 049	2 177	2 180	3 088
		System input volume	kl/annum							41 065 000	40 243 700
		Billed metered consumption	kl/annum							16 326 720	20 081 866
		Billed unmetered consumption	kl/annum								
		Unbilled metered consumption	kl/annum								
		Unbilled unmetered consumption	kl/annum								
Water Balance Calculations		Revenue water	kl/annum	0	0	0	0	0	0	16 326 720	20 081 866
		Non-Revenue water	kl/annum	0	0	0	0	0	0	24 738 280	20 161 834
		Water Losses	kl/annum	0	0	0	0	0	0	24 738 280	20 161 834
		% Non-revenue water		No data	No data	No data	No data	No data	No data	60.2%	50.1%
		% Water Losses		No data	No data	No data	No data	No data	No data	60.2%	50.1%
Key performance indicators		Input : Litres / capita / day		No data	No data	No data	No data	No data	No data	182	125
		Input: m³ / household / month		No data	No data	No data	No data	No data	No data	24	17
		Billed : Litres / capita / day		No data	No data	No data	No data	No data	No data	73	63
		Billed : m³ / household / month		No data	No data	No data	No data	No data	No data	10	8
		% Population growth		0.86%	0.60%	0.75%	0.60%	-7.02%	6.24%	-0.44%	41.85%
		% Water demand growth								#DIV/0!	#DIV/0!
Source of information											



Comments

WCWDM STRATEGY : Qualitative Scorecard

Municipality Name	Thulamele

Introduction

The purpose of this section is to perform a qualitative evaluation of the municipality's water business. The objectives are as follows :

SWOT Analysis	External - Opportunities Positive external conditions which you don't control which you could take advantage of	External - Threats Negative conditions you don't control but could minimise their effects
Internal - Strengths Positive aspects under your control and on which you may wish to capitalise	Strengths and Opportunities (SO) – Strategies that use strengths to maximize opportunities.	Strengths and Threats (ST) – Strategies that use strengths to minimize threats.
Internal - Weaknesses Negative aspects under your control (to a large extent) which you could plan to improve	Weaknesses and Opportunities (WO) – Strategies that minimize weaknesses by taking advantage of opportunities.	Weaknesses and Threats (WT) – Strategies that minimize weaknesses and avoid threats.

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
1	**INSTITUTIONAL REVIEW**				
1.1	**Water and Sanitation department structure**				
1.1.1	Is there an approved organogram for the Water and Sanitation Department?	There is an approved organogram in place. There is sufficient capacity but it is not effective in undertaking the necessary tasks.	O	Review the existing organogram and ensure that it incorporates WC/WDM personnel in consultation with the District.	1
1.1.2	What is the vacancy rate in the department and is it a problem?	There is a 5% vacancy rate in O&M and 10% at management level. Most of the current staff particularly at the management level are acting in their positions.	T	Engage with the District and advertise and fill the identified critical vacant posts. Engage with the Department of finance at the District Level to identify and explore possible funding options and budget requirements for the critical posts.	1
1.1.3	Does the department have the correct technical skills for the correct posts.	The O&M level is correctly skilled however the skills are lacking at the managerial level.	T	Increase management, and O&M capacity through new human resources and support it with WC/WDM training.	1
1.1.4	Is training and capacity building being done?	Some managerial training is provided however no other training is being done. There are intentions to do some training on O&M.	O	Institute a mandatory WC/WDM training programme for technical staff. Invest in team building and workshop sessions incorporating the councillors and municipal management to boost staff morale.	2
1.1.5	Are there sufficient support structures ito vehicles, equipment, materials etc.?	The funding is available but planning is lacking. This is further compounded by the transfer issues related to the District taking over the WSA function.	S	Continue to allocate an adequate budget for the critical spares. Allocate a specific person who will be responsible for expediting equipment orders and managing quality control in terms of the procurement process.	2

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
1.1.6	Does the municipality own any water loss control equipment such as loggers, listening sticks, etc.?	No.	O	It is recommended that loggers and simple leak detection equipment be purchased to improve water loss monitoring and management in the system.	3
1.2	**Municipal support**				
1.2.1	Describe the working relationship with other departments such finance, planning, housing etc.?	The relationship with other departments is fair but there is room for improvement. The relationship with the finance department specifically is good.	O	Establish a NRW steering committee comprising representatives from the technical, communications and finance departments to improve communication and access to information.	1
1.2.2	Are the politicians supporting the department?	The politicians are very supportive and they do understand the water business.	O	Undertake a councillor WC/WDM induction programme to capitalise on the existing relationship and build a communication bridge between the municipality and the customers.	2
1.3	**Public Private Partnerships**				
1.3.1	Is there any major industrial or institutional role player in the area and is there co-operation?	The CSIR is a potential partner in the area. They can be engaged to assist with the package plants.	O	Identify any other additional role players through the top consumer monitoring and conduct courtesy visits as a first phase of the programme. Establish a stakeholder forum if practicable and encourage the participation of the big industries in the forum.	3
1.3.2	If yes, what does the co-operation involve and can it be expanded?				
1.4	**Legislation and bylaws**				
1.4.1	Does the municipality have a customer service charter?	The information required for the charter is captured In 3 documents which will be made public. This is in the process of being developed.	O	Develop a customer service charter to ensure the customers are aware of the municipality's commitment and their responsibilities as consumers.	3
1.4.2	What is the status and age of the existing bylaws and do they address water loss management?				
1.4.3	Are bylaws enforced and if not, why not?				
1.4.4	What is the status and age of Water Services Development Plan?				
2	**FINANCIAL REVIEW**				
2.1	**Financial Department**				
2.1.1	What is your opinion of the Finance Department's ability to perform metering and billing	The finance department is effective in carrying out their activities.	O	Improve communication and access to information between the technical and finance department through scheduled monthly team meetings in order to fully utilise this resource.	1
2.1.2	Is training and capacity building being done?	There is some training provided for the department.	O	Plan a WC/WDM workshop for the finance personnel and meter readers to facilitate an improved understanding of the technical issues and information requirements.	2

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
2.1.3	What is the state of the municipal metering and billing system?	The state of billing is improving but the there are 40 000 unmetered connections. There are also a lot of communal taps.	O	Obtain billed metered consumption from the finance department on a monthly basis and monitor water sales. Meter and bill 100% of non domestic connections as a priority and increasingly meter and bill the domestic consumers where practicable to increase revenue water.	1
2.1.4	What is your primary source of funding?	Internal revenue and Grant funding.	O	Focus on improving cost recovery to continuously reduce dependency on grant funding.	2
2.2	**Tariffs**				
2.2.1	Who prepares the water tariffs and what is it based on?	The technical and finance department develop the tariffs.	T	Ensure that the technical department makes inputs into the tariff setting process to ensure that the tariffs are feasible for the municipality and the consumers. Institute a rising block tariff sufficiently differentiated in cost at each level to promote WC/WDM with the highest tariff at least double the lowest tariff.	2
2.2.2	What is the tariff structure and does it promote WCWDM?	There is a step tariff in place. The tariffs have recently been revised however the cost of water does not adequately cater for the cost of service provision.	T	Review the current tariff structure. Institute a rising block tariff sufficiently differentiated in cost at each level to promote WC/WDM with the highest tariff at least double the lowest tariff.	2
2.2.3	Is the water supplied considered affordable by the customers?	The water is considered affordable.	S	Continue ensuring that the tariffs remain affordable particularly for the efficient and low income water users.	2
2.3	**Meter Reading and Billing**				
2.3.1	Who performs the water meter readings, frequency and accuracy?	The technical department is in charge of meter reading.	S	Monitor the frequency of meter reading and customer complaints of inaccurate billing to determine the effectiveness of the meter readers.	2
2.3.2	Are the meter readers trained and can they report leakage when encountered on site?	Yes.	O	Continue to provide training for the meter readers on an annual basis particularly on site training based on feedback from the consumers.	2
2.3.3	Is the water bill understandable and informative?	Yes.	O	Consider including water conservation tips and information in the water bill. It is also recommended to display 6 months graphical consumption data on the bill to aid consumers in effectively monitoring water use.	3
2.4	**Credit control**				
2.4.1	Is credit control being implemented and by whom?	Credit Control is being implemented very effectively by the department of finance.	O	Capitalise on the effective credit control and ensure that the areas that are not yet metered are metered and billed to increase revenue water.	3
2.4.2	What is the current level of non-payment?	The level of non payment is currently approximately 30%.	O	Focus on promoting payment for services in the township areas through the councillors and education and awareness. Improve the quality of service through obtaining proper management information and monitoring the zones on a monthly basis.	1
3	**SOCIAL REVIEW**				

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
3.1	**Customer profile**				
3.1.1	Describe the general consumer profile i.e. Income levels, indigence, unemployment, literacy	80% of the consumers are indigent. There are a few high income consumers however the majority is low income.	**O**	Focus on educating the indigent population on efficient water use and the importance of the free basic allocation as well as its limitations.	**1**
3.1.2	Describe the relationship between customers and the municipality and reasons?	The relationship is contentious due to the frequent water cut offs and the restriction of water in cases of non payment. The consumers are currently on intermittent supply.	**T**	Engage with the consumers through the councillors and gain their support and cooperation whilst the municipality resolves the water services challenges. Build on the relationship with all the consumers and strengthen it through community awareness campaigns.	**1**
3.2	**Customer awareness**				
3.2.1	Are consumers informed regarding the value of water?	The consumers don't value water.	**T**	Budget and undertake a continuous annual education and awareness campaign focusing on promoting water use efficiency.	**1**
3.2.2	What is the level of leakage reporting by the community and what method do they use?	The community generally doesn't report leakage.	**O**	Make one number available for the reporting of leaks. Publicise the number and ensure that the leak reports are captured in an electronic system to aid more effective tracking of the leakage and to promote reporting by the community.	**2**
3.2.3	What are the most prominent consumer behavioural challenges encountered by the municipality?	Illegal connections, vandalism and theft of borehole pumps and transformers as well as brass taps are the main behavioural challenges faced by the municipality	**T**	The community awareness campaign should be tailored to address these problems. The councillors should be encouraged to make these issues an agenda at all public metering held in the different wards.	**2**
3.2.4	Is xeriscaped gardening and rain water harvesting encouraged?	No.	**O**	As part of a community awareness campaign, encourage consumers to harvest rain water and utilise it for garden irrigation and cleaning to reduce the demand for potable water.	**2**
3.2.5	Are radio campaigns, bill board, pamphlets, informative billing used to inform and educate customers?	No.	**O**	Develop simple visual material in the form of pamphlets which can be used to educate consumers on efficient water use. Build on the media campaign undertaken and periodically publicise water tips on local radio stations and newspapers.	**2**
3.3	**Schools awareness**				
3.3.1	Number of primary and secondary schools?	more than 200 schools.	**O**	Huge benefit can be derived from the expansion of the schools programme. The section 21 schools in particular should be visited, monitored and encouraged to fix leakage as the O&M budgets are operated by the school management for this category of schools.	**3**
3.3.2	Frequency and scope of schools awareness campaigns?	N/A			
3.3.3	Are goals and objectives monitored and controlled?	No	**O**	Establish a relationship with schools. Monitor their consumption and undertake education and awareness.	**3**

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
3.4	**Customer Care Centre**				
3.4.1	Does the municipality have a CCC and who operates it?	No.	**O**	Obtain trained individuals to receive and refer customer complaints and establish a customer care land line. Publicise the call centre and encourage the consumers to become the eyes and ears of the municipality and to report water and sanitation related problems.	**2**
3.4.2	How and to whom are billing queries referred?	The people call the operations and maintenance manager to report leaks. There is a job card system which is both electronic and manual. A proper capturing system is however required.	**O**	Obtain an electronic system to capture and monitor the queries referred and to track the resolution of the queries.	**2**
3.4.3	To whom are the leak reports referred and do consumers have confidence in the reporting system?				

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
4	**TECHNICAL REVIEW**				
4.1	**Measurement and control**				
4.1.1	Is the system input volume measured, monitored and controlled?	There are bulk are meters in place , the SIV information is available.	**S**	Read bulk meters on a monthly basis and continue to monitor input volumes.	**1**
4.1.2	Is the water supply system sectorised into zones and districts?	Uncertain.			
4.1.3	Are the supply to the zones and districts metered?				
a	Is the system monitored through a telemetry system?	No.	**O**	Obtain an appropriate real time telemetry system to improve the monitoring of the network.	**2**
4.1.5	What is the Frequency and detail of your water balance calculation?	The calculations are not being done.	**W**	Develop an NRW water balance which must be updated on a monthly basis to monitor water losses.	**1**
4.1.6	Are minimum night flows, consumption trends and logging used to monitor the system?	No.	**O**	Obtain and install logging equipment periodically on the zone meters once they have been installed and conduct MNF analysis to determine leakage levels and areas experiencing high or low pressures.	**3**
4.1.7	Are monthly management reports prepared and key performance indicators measured?	There are daily readings being taken but no water balance calculations are conducted.	**O**	Consolidate the available data from the bulk meters and department of finance and compile a monthly NRW report with the relevant KPI's.	**1**
4.2	**Physical leakage**				
4.2.1	What is the average age of the network, pipe material, replacement programme?	There are a few new pipes however most of them are more than 20 years old. They are mainly asbestos cement. There is currently no replacement programme in place.	**T**	Set aside 5% of the CAPEX budget for the replacement of the network.	**1**
4.2.2	Number of burst pipes reported and repaired per week / month and the average response time?	Pipe bursts are taking place on a daily basis. The average response time is 8hrs for pipe bursts and 48hrs for pipe connection leakage.	**S**	Continue to monitor the frequency of pipe bursts. Ensure that all pipe bursts are fixed within 48hrs.	**1**
4.2.3	What is the primary cause of burst pipes?	The age of the network, high pressures in certain areas and intermittent supply.	**W**	Allocate a proper budget for replacement and refurbishment. Budget a minimum of 5% of the infrastructure value for this purpose to reduce the risk of system failure. Also consider implementing pressure management in areas with high burst frequencies.	**1**
4.2.4	Are active leak detection programmes conducted?				
4.2.5	How often and for how long do reservoirs overflow?	This happens very seldom.	**O**	Obtain an appropriate real time telemetry system to improve the monitoring of the reservoirs and the network.	**3**
4.2.6	Are water losses from treatment processes (backwash, etc.) monitored and minimised?				

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
4.2.7	Is leakage on private properties a problem and if so, why?	There is a huge problem of internal leakage in the municipality.	T	Undertake an internal leak audit in critical areas to accurately determine the extent of water losses and do a cost benefit analysis to assess the merit of periodically performing leak repairs for indigent consumers.	1
4.2.8	Are leaks on indigent private properties repaired and removal of wasteful devices encouraged?	No.	T	Review existing indigent policy and consider undertaking an internal leak audit and repair exercise for indigent and non paying consumers to drastically reduce the NRW.	1
4.3	**Pressure management and control valves**				
4.3.1	What is the average and maximum system pressure?	The pressures are generally very low but it does vary.	S	Maintain the satisfactory operating pressure and ensure that operating pressures never exceed the DWA regulatory standard of 9 bar.	3
4.3.2	Is basic or advanced pressure management being implemented?	No.	O	Consider undertaking logging in areas experiencing high burst frequencies and monitor on a monthly basis. If the pressures are high for the area or exceed the regulations stipulated 9 bar, install pressure reducing valves to regulate the pressures more effectively.	2
4.3.3	Are control valves pro-actively being maintained to prevent overflowing reservoirs?	Only reactive maintenance is taking place.	T	Undertake an annual control valve audit to assess the condition of the control valves and ensure that they are in proper working order.	2
4.4	**Consumer metering**				
4.4.1	Are domestic and non-domestic consumers metered and which type of meter is used?				
4.4.2	What is the condition, age and accuracy of water meters?	Most of the meters are more than 10 years old.	O	Budget and implement a meter replacement programme particularly for bulk and non domestic consumers to improve cost recovery.	2
4.4.3	Are the top consumers pro-actively monitored on a monthly basis?	The top consumers are monitored but not engaged with.	S	Continue to monitor the top consumers. Undertake a top consumer audit and ensure that all connections are metered and billed.	1
4.4.4	Describe the water quality and its impact on consumer water meters?	The potable water quality in the Municipality is general very good and it doesn't impact on the meters. The borehole water quality may be different however.	S	Continue to monitor and report on water quality and ensure that it complies with the DWA blue drop standards.	2
4.4.5	What is the prevalence and control of illegal connections?	There is a high prevalence of unmetered connections mixed in with illegal connections which are primarily in the former Gazankulu area.	T	Actively monitor illegal connections and periodically undertake an audit on the meters. This can be conducted by the meter readers.	1
4.5	**Management information**				
4.5.1	Does the Municipality have an asset register and asset management programme?	There is an asset register which sits with District and the LM. The asset register is purely financial and is GRAP compliant.	O	Review the asset register system in place. Maintain and update the asset register on an annual basis. Ensure that the asset register provides critical technical information such as the age, value and replacement date of the assets.	2
4.5.2	What is the status and age of as-built drawings?	There are some as built drawings available but they have not been updated and are in hard copy.	T	Develop electronic as built drawings for the whole network.	2

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
Summary					

SWOT Analysis	Helpful	Harmful
Internal factors (Staff, infrastructure, tools, equipment)	Approved organogram in place Monitoring of top consumers Customer Service Charters in all the LM's	Very high vacancy rate - lack of capacity No water loss equipment No proactive monitoring of water losses in zones Limited bulk metering No Sectorisation and zone metering
Internal factors (Politics, finance, consumers, economics)	Good relationship with finance but can improve Community and schools Awareness Councillor training programme Review charters, policies and bylaws to promote WDM Metering of all non domestic consumers	Very old infrastructure Insufficient vehicles and material to support O&M Dependency on grant funding Uninformed community Illegal connections High levels of leakage on private properties Poor relationship with consumers Uninformed councillors

WCWDM STRATEGY : Quantitative Scorecard

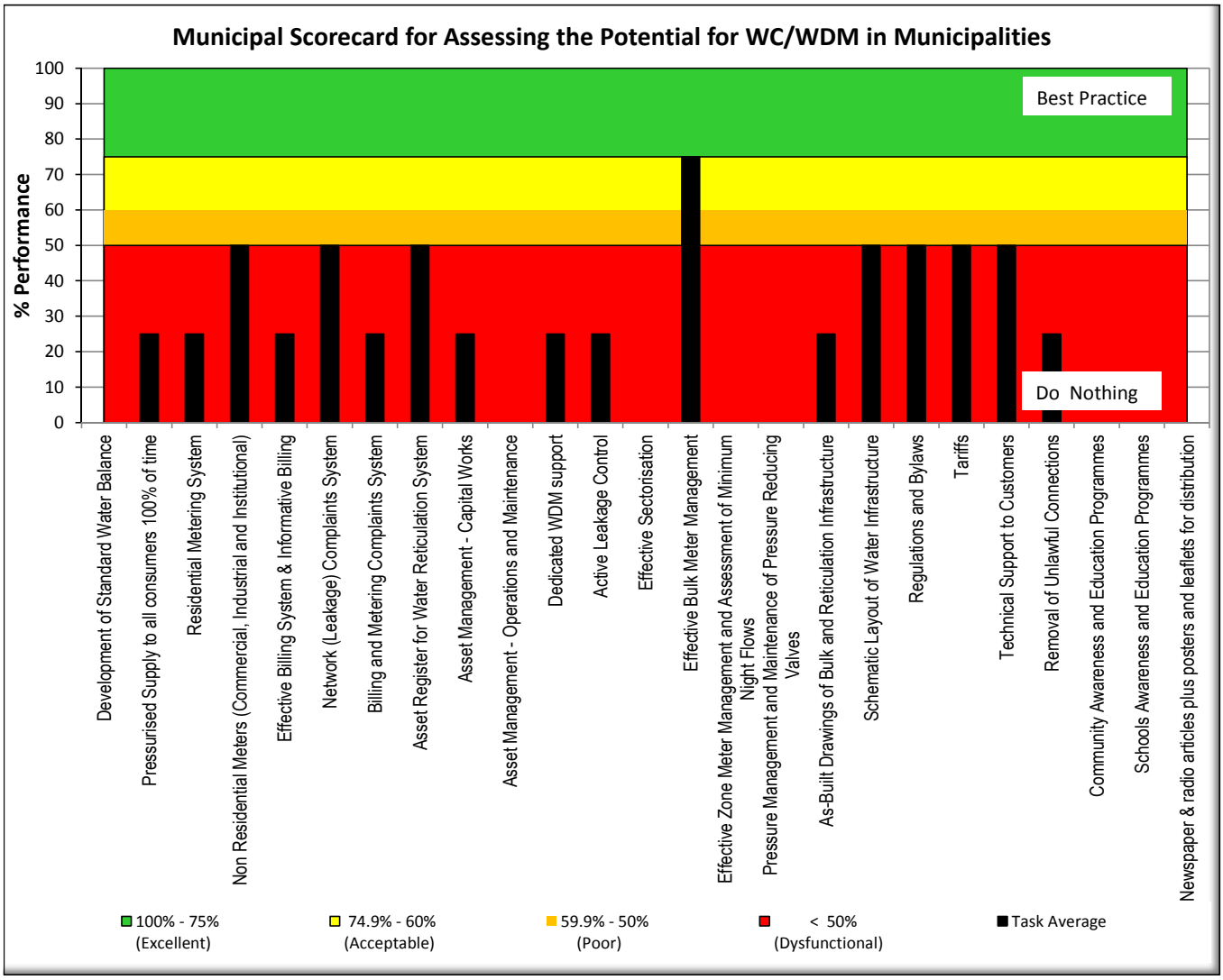
Municipality Name	Thulamela

Introduction

The purpose of the Water Conservation / Water Demand Management (WC/WDM) Scorecard is to ascertain the status quo of WC/WDM and evaluate the potential for WC/WDM measures to be implemented in these systems. The scorecard is also designed to enable the Regulator (Department of Water Affairs) to assess the current situation regarding losses and levels of wastage in all water supply systems countrywide. The scorecard consists of 25 multiple choice questions with each question getting scored from 0 to 4. The Regulator and WSA can track progress with each year the scorecard gets completed. Each question ends with an audit requirement which indicates what will be required by the Regulator should the questionnaire be audited. It also provides an indication on what is required in terms of each of the measures.

Completed by					
Date	Mar-12				Average
1. Development of Standard Water Balance	0				0
2. Pressurised supply to all consumers 100% of time	1				1
3. Residential Metering System	1				1
4. Non Residential Meters (Commercial, Industrial and Institutional)	2				2
5. Effective Billing System & Informative Billing	1				1
6. Network (Leakage) Complaints System	2				2
7. Billing and Metering Complaints System	1				1
8. Asset Register for Water Reticulation System	2				2
9. Asset Management - Capital Works	1				1
10. Asset Management - Operations and Maintenance	0				0
11. Dedicated WDM support	1				1
12. Active Leakage Control	1				1
13. Effective Sectorisation	0				0
14. Effective Bulk Meter Management	3				3
15. Effective Zone Meter Management and Night Flow Analysis	0				0
16. Pressure Management and Maintenance of Pressure Reducing Valves	0				0
17. As-Built Drawings of Bulk and Reticulation Infrastructure	1				1
18. Schematic Layout of Water Infrastructure	2				2

Date	Mar-12				Average
19. Regulations and Bylaws	2				2
20. Tariffs	2				2
21. Technical Support to Customers	2				2
22. Removal of Unlawful Connections	1				1
23. Community Awareness and Education Programmes	0				0
24. Schools Awareness and Education Programmes	0				0
25. Newspaper & radio articles plus posters and leaflets for distribution	0				0
Total score (maximum 100)			0	0	26



WCWDM STRATEGY AND BUSINESS PLAN : BUDGET AND CASH FLOW

Municipality name	Thulamela

COSTS

Item		Unit	Quantity / year	Rate	Year 1	Year 2	Year 3	Year 4	Year 5	Total
INSTITUTIONAL / LEGISLATIVE INTERVENTIONS										
Institutional review:					100%					100%
CAPEX	Review organogram and fill vacancies	Sum	1	R 200 000	R 200 000	R 0	R 0	R 0	R 0	R 200 000
OPEX		Sum			R 0	R 0	R 0	R 0	R 0	R 0
Training and education :					50%	50%				100%
CAPEX	Not applicable	No		R 0	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Assume one training course / employee / annum	No	10	R 5 000	R 50 000	R 50 000	R 50 000	R 50 000	R 50 000	R 250 000
Customer charter, policy, bylaws :							100%			100%
CAPEX	Review bylaws on 5 year cycles	Sum	1	R 200 000	R 0	R 0	R 200 000	R 0	R 0	R 200 000
OPEX	Enforce bylaws	Sum	1	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 500 000
FINANCIAL INTERVENTIONS										
Effective metering and billing :					50%	50%				100%
CAPEX	Perform meter audit	No		R 0	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Ensure proper metering and billing of all consumers	No	137 854	R 100	R 13 785 400	R 13 785 400	R 13 785 400	R 13 785 400	R 13 785 400	R 68 927 000
Water tariffs :					50%		50%			100%
CAPEX	Review water tariffs	Sum	1	R 200 000	R 100 000	R 0	R 100 000	R 0	R 0	R 200 000
OPEX	Not applicable	Sum		R 0	R 0	R 0	R 0	R 0	R 0	R 0
Informative billing :					50%	50%				100%
CAPEX	Improve invoice to show monthly consumption	Sum	1	R 200 000	R 100 000	R 100 000	R 0	R 0	R 0	R 200 000
OPEX	Distribute information with bill	Sum	137 854	R 120	R 16 542 480	R 16 542 480	R 16 542 480	R 16 542 480	R 16 542 480	R 82 712 400
SOCIAL INTERVENTIONS										
Consumer Awareness Campaign :					20%	20%	20%	20%	20%	100%
CAPEX	Install bill boards, design pamphlets, radio campaigns	Sum	137 854	R 120	R 3 308 496	R 3 308 496	R 3 308 496	R 3 308 496	R 3 308 496	R 16 542 480
OPEX	Target households on monthly basis with awareness cam	No	137 854	R 60	R 8 271 240	R 8 271 240	R 8 271 240	R 8 271 240	R 8 271 240	R 41 356 200
Consumer Help and Support Desk :					100%					100%
CAPEX	Improve existing help-desk to provide one-stop service	Sum	1	R 200 000	R 200 000	R 0	R 0	R 0	R 0	R 200 000
OPEX	Maintain help-desk	Sum	1	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 500 000
Schools awareness :					20%	20%	20%	20%	20%	100%
CAPEX	Prepare schools competition, awareness, retrofit	No		R 20 000	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Monthly schools awareness campaign	No		R 2 000	R 0	R 0	R 0	R 0	R 0	R 0

TECHNICAL INTERVENTIONS										
Bulk metering :					50%	50%				100%
CAPEX	New meter installations required	No		R 50 000	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Maintenance of existing bulk meters	No	10	R 1 000	R 10 000	R 10 000	R 10 000	R 10 000	R 10 000	R 50 000
Sectorisation :					50%	50%				100%
CAPEX	Setup of new DMA / PMAs	No	4	R 50 000	R 100 000	R 100 000	R 0	R 0	R 0	R 200 000
OPEX	Maintenance of DMA / PMAs including step testing	No	4	R 25 000	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 500 000
Active Leakage Control :					50%	50%				100%
CAPEX	Not applicable	No		R 0	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Fix all visible and reported leaks	No		R 1 000	R 0	R 0	R 0	R 0	R 0	R 0
Valve audits					20%	20%	20%	20%	20%	100%
CAPEX	Locate, clean, repair, document network valves	No		R 4 000	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Maintain network valves	No		R 1 000	R 0	R 0	R 0	R 0	R 0	R 0
Leak and logging equipment :					25%	25%	25%	25%		100%
CAPEX	Procure basic WDM equipment	Sum	2	R 20 000	R 10 000	R 10 000	R 10 000	R 10 000	R 0	R 40 000
OPEX	Not applicable	Sum			R 0	R 0	R 0	R 0	R 0	R 0
Telemetry :						50%	50%			100%
CAPEX	Install telemetry sites	No		R 15 000	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Maintain telemetry sites	No		R 1 500	R 0	R 0	R 0	R 0	R 0	R 0
Retrofitting and removal of wasteful devices :					20%	20%	20%	20%	20%	100%
CAPEX	Retrofit government buildings, schools, etc.	No	27 571	R 1 000	R 5 514 160	R 5 514 160	R 5 514 160	R 5 514 160	R 5 514 160	R 27 570 800
OPEX	Not applicable	No		R 0	R 0	R 0	R 0	R 0	R 0	R 0
Mains replacement :					20%	20%	20%	20%	20%	100%
CAPEX	Replace critical leaking mains	km		R 100 000	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Not applicable	km		R 0	R 0	R 0	R 0	R 0	R 0	R 0
Pressure management :					50%	50%				100%
CAPEX	New pressure management installations	No	4	R 75 000	R 150 000	R 150 000	R 0	R 0	R 0	R 300 000
OPEX	Maintain pressure management installations	No	4	R 5 000	R 20 000	R 20 000	R 20 000	R 20 000	R 20 000	R 100 000
Control valve management :					50%	50%				100%
CAPEX	New control valve installations	No		R 0	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Maintain all control valve installations	No		R 5 000	R 0	R 0	R 0	R 0	R 0	R 0
Consumer metering :					20%	20%	20%	20%	20%	100%
CAPEX	Replacement of old water meters	No	13 786	R 1 200	R 3 308 568	R 3 308 568	R 3 308 568	R 3 308 568	R 3 308 568	R 16 542 840
OPEX	Replacement of broken and cycled water meters	No	6 893	R 1 200	R 8 271 420	R 8 271 420	R 8 271 420	R 8 271 420	R 8 271 420	R 41 357 100
Top consumer audit :					20%	20%	20%	20%	20%	100%
CAPEX	Audit and retrofit non domestic consumers	No	6 893	R 10 000	R 13 785 700	R 13 785 700	R 13 785 700	R 13 785 700	R 13 785 700	R 68 928 500
OPEX	Maintain non domestic consumers installations	No	6 893	R 500	R 3 446 500	R 3 446 500	R 3 446 500	R 3 446 500	R 3 446 500	R 17 232 500
GIS / CAD system :					50%	50%				100%
CAPEX	Setup CAD/ GIS system	Sum	1	R 200 000	R 100 000	R 100 000	R 0	R 0	R 0	R 200 000
OPEX	Maintain CAD / GIS system	Sum	1	R 200 000	R 200 000	R 200 000	R 200 000	R 200 000	R 200 000	R 1 000 000
Management Information System :					50%	50%				100%

CAPEX	Setup basic MIS system to support WDM	Sum	1	R 200 000	R 100 000	R 100 000	R 0	R 0	R 0	R 200 000
OPEX	Maintain MIS system	Sum	1	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 500 000
Water loss monitoring and audits:					100%					100%
CAPEX	Perform proper analysis of distribution network	Sum	1	R 200 000	R 200 000	R 0	R 0	R 0	R 0	R 200 000
OPEX	Perform ad hoc analysis to monitor interventions	Sum	1	R 20 000	R 20 000	R 20 000	R 20 000	R 20 000	R 20 000	R 100 000

Item	Type			Year 1	Year 2	Year 3	Year 4	Year 5	Total
TOTAL COSTS									
Institutional	CAPEX			R 200 000	R 0	R 200 000	R 0	R 0	R 400 000
	OPEX			R 150 000	R 150 000	R 150 000	R 150 000	R 150 000	R 750 000
	TOTAL			**R 350 000**	**R 150 000**	**R 350 000**	**R 150 000**	**R 150 000**	**R 1 150 000**
Financial	CAPEX			R 200 000	R 100 000	R 100 000	R 0	R 0	R 400 000
	OPEX			R 30 327 880	R 30 327 880	R 30 327 880	R 30 327 880	R 30 327 880	R 151 639 400
	TOTAL			**R 30 527 880**	**R 30 427 880**	**R 30 427 880**	**R 30 327 880**	**R 30 327 880**	**R 152 039 400**
Social	CAPEX			R 3 508 496	R 3 308 496	R 3 308 496	R 3 308 496	R 3 308 496	R 16 742 480
	OPEX			R 8 371 240	R 8 371 240	R 8 371 240	R 8 371 240	R 8 371 240	R 41 856 200
	TOTAL			**R 11 879 736**	**R 11 679 736**	**R 11 679 736**	**R 11 679 736**	**R 11 679 736**	**R 58 598 680**
Technical	CAPEX			R 23 268 428	R 23 068 428	R 22 618 428	R 22 618 428	R 22 608 428	R 114 182 140
	OPEX			R 12 167 920	R 12 167 920	R 12 167 920	R 12 167 920	R 12 167 920	R 60 839 600
	TOTAL			**R 35 436 348**	**R 35 236 348**	**R 34 786 348**	**R 34 786 348**	**R 34 776 348**	**R 175 021 740**
Total	CAPEX			R 27 176 924	R 26 476 924	R 26 226 924	R 25 926 924	R 25 916 924	R 131 724 620
	OPEX			R 51 017 040	R 51 017 040	R 51 017 040	R 51 017 040	R 51 017 040	R 255 085 200
	TOTAL			**R 78 193 964**	**R 77 493 964**	**R 77 243 964**	**R 76 943 964**	**R 76 933 964**	**R 386 809 820**
				R 78 193 964	R 77 493 964	R 77 243 964	R 76 943 964	R 76 933 964	

BENEFITS

Item	Unit			Year 1	Year 2	Year 3	Year 4	Year 5	Total
CHANGE IN CONSUMPTION									
Reduced input volume				20%	40%	60%	80%	100%	300%
Volume	m^3/annum	821 300		164 260	328 520	492 780	657 040	821 300	2 463 900
Amount	R / annum	0	R 3.50	R 0	R 0	R 0	R 0	R 0	R 0
Increased revenue water				20%	40%	60%	80%	100%	300%
Volume	m^3/annum	3 755 146		751 029	1 502 058	2 253 087	3 004 116	3 755 146	11 265 437
Amount	R / annum	0	R 7.00	R 5 257 204	R 10 514 408	R 15 771 612	R 21 028 815	R 26 286 019	R 78 858 058
Total	**R / annum**			**R 5 257 204**	**R 10 514 408**	**R 15 771 612**	**R 21 028 815**	**R 26 286 019**	**R 78 858 058**

Payback period - years **4.9**

WC/WDM Projection summary and targets

Municipality name	Thulamela

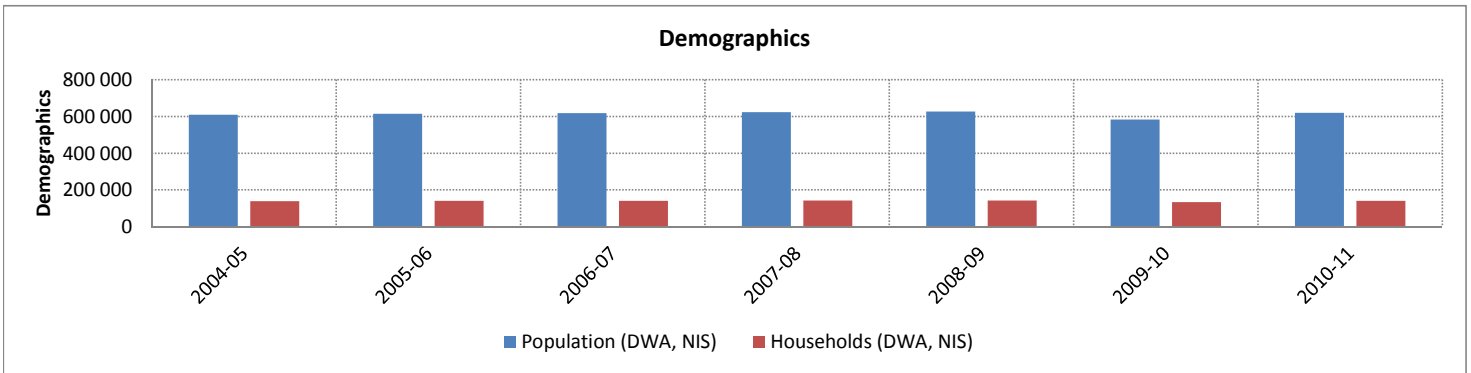
Water Demand projection	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Less 1.0% WDM Scenario							41.00	41.34	41.69	42.03	42.38	42.73
Less 3.0% WDM Scenario							40.86	41.07	41.27	41.47	41.67	41.87
Less 5.0% WDM Scenario							40.73	40.79	40.85	40.90	40.96	41.01
Actual Demand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.07				
High population No WDM							41.07	41.48	41.90	42.31	42.74	43.16
Current yield	41.07	41.07	41.07	41.07	41.07	41.07	41.07	41.07	41.07	41.07	41.07	41.07

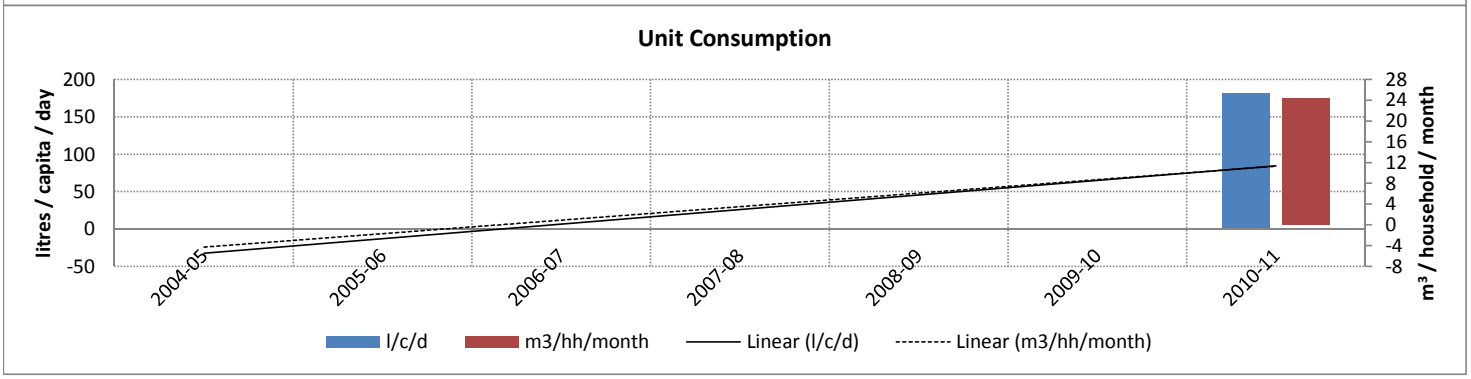
Savings	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Less 1.0% WDM Scenario							0.07	0.14	0.21	0.28	0.36	0.43
Less 3.0% WDM Scenario							0.21	0.41	0.63	0.85	1.07	1.29
Less 5.0% WDM Scenario							0.34	0.69	1.05	1.41	1.78	2.16
Actual savings							0.01					

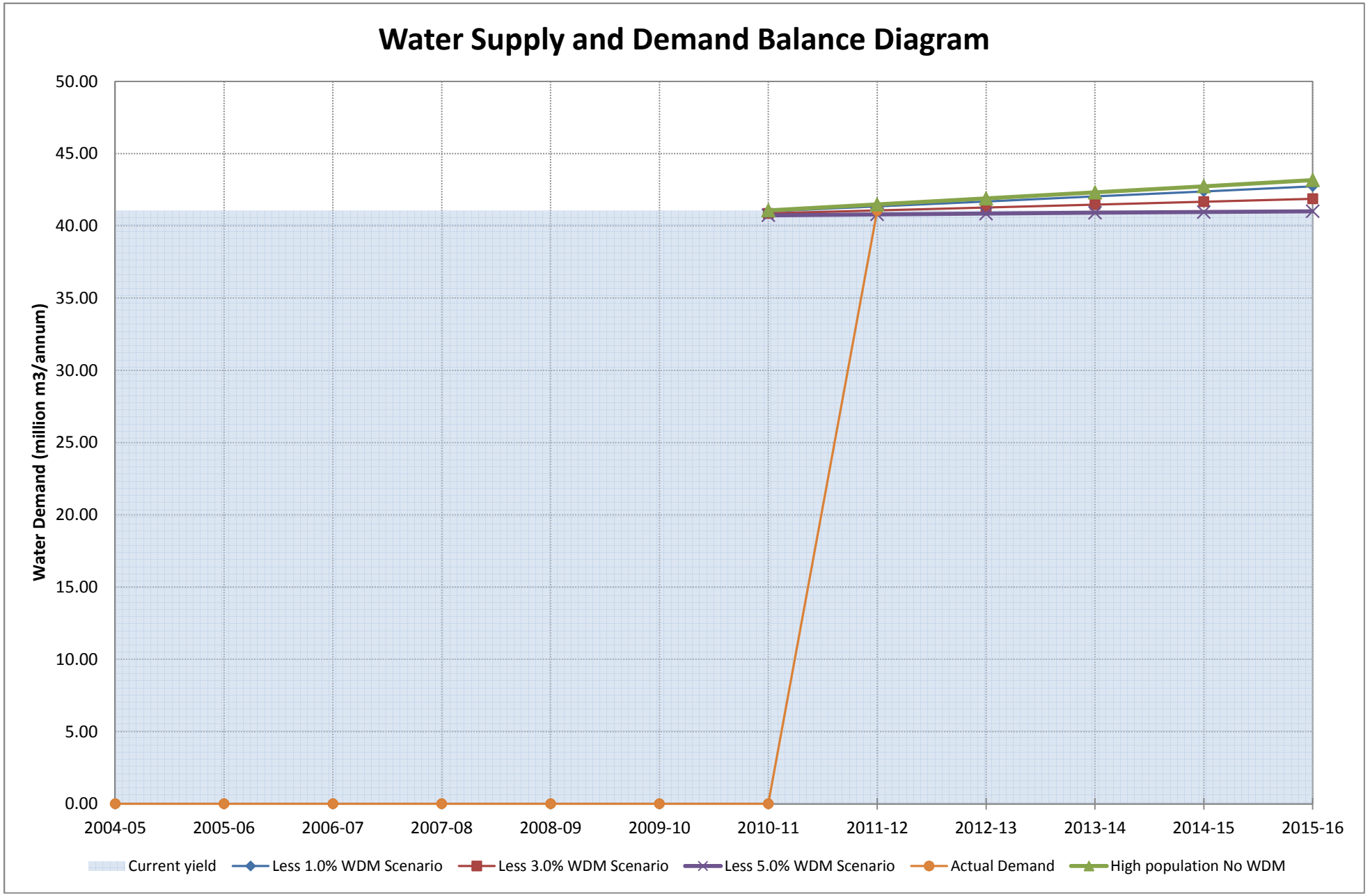
% Reduction	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Less 1.0% WDM Scenario							0.17%	0.33%	0.50%	0.67%	0.83%	1.00%
Less 3.0% WDM Scenario							0.50%	1.00%	1.50%	2.00%	2.50%	3.00%
Less 5.0% WDM Scenario							0.83%	1.67%	2.50%	3.33%	4.17%	5.00%

Year / Year % Growth	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Less 1.0% WDM Scenario								0.8%	0.8%	0.8%	1.7%	1.7%
Less 3.0% WDM Scenario								0.5%	0.5%	0.5%	1.0%	1.0%
Less 5.0% WDM Scenario								0.2%	0.1%	0.1%	0.3%	0.3%
Actual Demand								#DIV/0!				
High population No WDM								1.0%	1.0%	1.0%	1.0%	1.0%

Key Performance Indicators	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Population (DWA, NIS)	609 763	615 020	618 707	623 346	627 094	583 067	619 448	616 711				
Households (DWA, NIS)	138 641	139 844	140 687	141 729	142 584	132 568	140 850	141 724				
l/c/d	0	0	0	0	0	0	182	0				
m3/hh/month	0	0	0	0	0	0	24	0				
Demand Ml/day	0	0	0	0	0	0	113	0				






Water Supply and Demand Balance Diagram
Water Demand (million m3/annum)
50.00
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
2004-05
2005-06
2006-07
2007-08
2008-09
2009-10
2010-11
2011-12
2012-13
2013-14
2014-15
2015-16
Current yield
Less 1.0% WDM Scenario
Less 3.0% WDM Scenario
Less 5.0% WDM Scenario
Actual Demand
High population No WDM

WCWDM STRATEGY : RPMS Compliance

Municipality name	Thulamela

Key questions from the Regulatory Performance Measurement System (RPMS) related to WC/WDM

KPI		ID	WSA Value
KPI 1 – Access to Water			
KPI 2 – Access to Sanitation			
KPI 3 – Access to Free Basic Water			
	Total poor households receiving Free Basic Water for last financial year	ID:012	
	Total poor households	ID:013	
KPI 4 – Access to Free Basic Sanitation			
	Total poor households receiving Free Basic Sanitation for last financial year	ID:014	
	Total poor households	ID:013	
KPI 5 – Drinking Water Quality			
KPI 6 –Wastewater Quality			
KPI 7 - Customer Services Standards			
Component 1 – Service Interruptions			
	Total number of Service interruptions in the last financial year	ID:034	
	Number of interruptions in continuous service to consumers, where interruption for a single incident was greater than 24h	ID:033	
Component 2 – CRM Systems			
	Does the WSA have a customer Charter	ID:036	
	Does the WSA have a customer service centre	ID:035	
	Is there a system to manage customer queries and log faults	ID:038	
	Does the incident tracking system escalate complaints if not responded to within a prescribed time?	ID:037	
KPI 8 - Institutional Effectiveness			
Component 1 - Institutional Effectiveness			
	Completed WSDP is approved by Council for the last financial year?	ID:039	
	Required policies are in place and approved by Council?	ID:040	
	Required bylaws are in place and approved by Council?	ID:041	
	Contracts and Service level agreements in place with all appropriate service delivery role-players (WSPs, internal etc.)	ID:042	
	The WSA monitors the KPIs defined by the contract or SLA?	ID:043	
Component 2 - Water Services Staff Effectiveness			
	Total Water Services staff costs for the last financial year	ID:045	
	Total cost of water and sanitation provision for the last financial year including interest and depreciation (expenditure)	ID:046	
	Total budgeted for water services staff according to the approved organogram for the last financial year	ID:078	
Component 3 - Grant Funding Effectiveness			
	Total grant funding allocation received for the last financial year	ID:048	
	Total grant funding allocation spent for the last financial year	ID:047	
Component 4 - WSA Annual Report			
	WSA annual report submitted to Minister	ID:077	
Component 5 - % Filled Posts on Organogram			
	Total number of posts on Council-approved organogram for the last financial year for water services staff	ID:080	
	Total number of posts filled on the approved water services organogram in the last financial year	ID:079	

KPI 9 - Financial Performance			
Component 1 – Financial Integrity			
	Is WSA ring-fenced? (Separate legal entity=3, Separate accounting entity=2, Partially ring-fenced=1, Not ring-fenced at all=0)	ID:049	
	Audit report evaluation. (Unqualified=4, Qualified=3, Adverse=2, Disclaimer=1, No report=0)	ID:050	
Component 2 – Average Debtor Days			
	Water Services sales income for the last financial year (water/sanitation)	ID:052	
	Total outstanding customer/consumer debt for water and sanitation for the last financial year	ID:051	
Component 3 – Revenue Collection Effectiveness			
	Water Services sales income for the last financial year (water/sanitation)	ID:052	
	Water Services billed income actually received from consumers for last financial year	ID:053	
Component 4 – Average Creditor Days			
	Total bulk water purchases for the last financial year	ID:055	
	Total bulk water accounts outstanding for the last financial year	ID:054	
Component 5 – Financial Sustainability			
	Total water and sanitation income for the last financial year	ID:056	
	Total cost of water and sanitation provision for the last financial year including interest and depreciation (expenditure)	ID:046	
Component 6 – Financial Effectiveness			
	Total outstanding customer/consumer debt (after provisions) for water and sanitation for the last financial year	ID:051	
	Total provision for doubtful debt for water and sanitation for the last financial year	ID:082	
KPI 10 Strategic Asset Management			
Component 1 - Capital Spent on Rehabilitation and Replacement			
	Total capital budget (Water and Sanitation) in the last financial year	ID:063	
	Total capital spent on refurbishment and replacement in the last financial year	ID:062	
Component 2 –Asset Management Effectiveness			
	Asset management plan status	ID:057	
	Asset register status	ID:058	
	Asset management system is electronic	ID:059	
Component 3 – O&M Expenditure			
	Total spent on O&M/Annual maintenance cost (Water and Sanitation) in the last financial year	ID:060	
	Replacement value of assets (water services infrastructure)	ID:061	
Component 4 – Replacement Saving			
	Depreciation value for the last financial year (Water and Sanitation infrastructure)	ID:065	
	Contribution to asset replacement fund for the last financial year. (Water and Sanitation)	ID:064	
Component 5 – Asset Register Monitoring			
	Asset register field monitored: Date acquired	ID:066	
	Asset register field monitored: Estimated remaining life of asset	ID:068	
	Asset register field monitored: Replacement value of asset	ID:070	
	Asset register field monitored: Purchase cost of asset	ID:069	
	Asset register field monitored: Description of asset (Yes/No)	ID:067	
KPI 11 Water Demand Management			
	System input volume (external sources) for the last financial year	ID:121	
	System input volume (own sources) for the last financial year	ID:122	
	Total billed metered water consumption (volume) for the last financial year	ID:071	
	Total billed unmetered water consumption (volume) for the last financial year	ID:074	
	Total unbilled metered water consumption (volume) for the last financial year	ID: 073	
	Total unbilled unmetered water consumption (volume) for the last financial year	ID: 123	
ADDITIONAL QUESTIONS FOR WATER USE EFFICIENCY			

	Water Conservation and Water Demand Management plan		
	Installation of water efficient devices		
	Repair of leaks		
	Measurement or control of water supplied		
	Pressure management		
Additional KPI : Tariff Data			
	Which of the listed elements are taken into account when you determine your tariff? Indicate from the list provided	ID: 201	
	Total amount of subsidies allocated to water for the next financial year	ID: 202	
	Total projected cost of water provision for the next financial year	ID: 203	
	Does your tariff recognise the difference between levels of service (according to Regulation 4 under s10 of the Water Services Act)?	ID: 204	
	Does your tariff recognise the difference between socio-economic status of customers (according to s10 of the Water Services Act)?	ID: 205	
	Do you charge a rising block tariff?	ID: 206	
	How many blocks are in your tariff structure?	ID: 207	
	What is your approved standard tariff? (Basic levy)	ID: 208	
	What are the actual 2010/2011 tariffs for the following consumer categories?	ID: 209	
	Do you reflect your tariff structure on your bill?	ID: 210	
	What are the quantities of water supplied to the following consumer categories (annually)?	ID: 211	
	What is the unit number of consumers served with water in each consumer category?	ID: 212	
	Do you have a seasonal tariff in your WSA?	ID: 213	
	Does your tariff include a fixed charge?	ID: 214	
	If a fixed charge is levied, do you subsidise the FBW?	ID: 215	
	What other sources of water services revenue (other than tariffs) does your WSA have? Indicate sources on the list provided	ID: 216	
	Total annual water services surplus / deficit	ID: 217	

water affairs

Department:
Water Affairs
REPUBLIC OF SOUTH AFRICA

Department of Water Affairs : Rapid Response Unit

Water Demand Management Strategy and Business Plan

for Vhembe District Municipality

May 2013

WCWDM STRATEGY AND BUSINESS PLAN: Signature Page

Title :	**Development of a First Order Water Conservation and Water Demand Management Strategy and Business Plan for Vhembe District Municipality**			
Authors :	**WA Wegelin, Z Siqalaba, N Zondo**			
Study Name:	**Development of a First Order Water Conservation and Water Demand Management Strategy and Business Plan for Various Municipalities under the DWA Rapid Response Programme : Limpopo Province**			
Status of Report :	**Final draft**			
Consultants :	**WRP Consulting Engineers (Pty) Ltd**			
Approved for Consultants :	Study leader	WA Wegelin, PrEng		
	Position	**Name**	**Signature**	**Date**
Municipality	**Vhembe District Municipality**			
Approved for municipality :	Municipal Manager			
	Position	**Name**	**Signature**	**Date**
Department of Water Affairs	**Limpopo Region**			
Approved for Regional Office :				
	Position	**Name**	**Signature**	**Date**
Department of Water Affairs	**Head Office**			
Approved for Head Office				
	Position	**Name**	**Signature**	**Date**

WCWDM STRATEGY AND BUSINESS PLAN: Contact details

Province	**Limpopo**	**WSA**	**Yes**
Municipal Code	**DC34**	**Category**	**C2**
District Municipality	**Vhembe**		
Municipality	**Musina LM, Mutale LM, Thulamela LM, Makhado LM**		
Settlements	**Beitbridge, Levubu, Makhado, Malamulele, Mopane, Musina, Mutale, Thohoyandou, Tshipise, Vivo**		

Information provided by			
Date	24/01/2012		
Contact person	N. Tshivhengwa		
Position			
Telephone	079 778 4628		
E-mail	tshivhengwan@vhembe.gov.za		
Study team contact			
Company	WRP Consulting Engineers		
Address	PO Box 1522, Brooklyn Square, 0075		
Contact person	Mr Willem Wegelin		
Telephone number	012 346 3496	**Cell number**	083 4477 999
E-mail	willemw@wrp.co.za		

Water Affairs contact			
Directorate	Limpopo Regional Office		
Address	Private Bag X9506, Polokwane, 0700		
Contact person	Ms Motlatso Machaba		
Telephone number	(015) 290 1272	**Cell number**	082 885 6125
E-mail	machabamo@dwa.gov.za		

Water Balance Data Confidence Level (see legend below)	
Input volume	Estimated values
Authorised consumption (Engineering functions)	Estimated values
Meter reading and billing (Finance functions)	Estimated values
Legend	
High level of accuracy	Calibrated bulk meters, >98% of consumers are metered < 10 years old, <2% billing complaints
Medium level of accuracy	Functional bulk meters, >90% of consumers are metered, <10% billing complaints
Low level of accuracy	Some functional bulk meters, >50% consumer meters, any age, meter reading & billing dysfunctional
Estimated values	No bulk or consumer meter readings, best estimate of water consumption
No data	No data and no idea of water consumption

WCWDM STRATEGY AND BUSINESS PLAN: Executive Summary

Province	Limpopo	**WSA**	Yes
Municipal Code	DC34	**Category**	C2
District Municipality	Vhembe		
Municipality			
Settlements			

Executive summary

Status quo

Very limited WCWDM activities are undertaken in the WSA and there is little management information available to perform a proper assessment of the water losses and potential savings. This assessment is inline with RPMS, Drop assessments and WSDP.
Most of the towns are informal with formal infrastructure in a relatively smaller area within the District which enables limited metering, billing and cost recovery in the WSA. The current metering, billing and cost recovery systems are inadequate.
The engineering departments in the Local Municipalities are characterised by high vacancies and low capacity and skills.
The current estimated unit consumption of 175 l/c/d is already very low and little further reduction is expected but a more detailed analysis is required to verify this number. It seems there has been a slight increase in the average unit consumption in the area. The relationship with the community is generally positive and the communities themselves are characterised by high unemployment and a large indigent population. The water tariffs are not promoting WCWDM, is not cost reflective and consumers do not value water supply.

Strategy

The municipality should focus on proper recording keeping, analysis and development of detailed management information. All vacancies must be filled as a matter of priority together with skills transfer and capacity building. The engineering and finance department must work closer together to improve metering, billing and cost recovery and start with a meter audit to resolve the high NRW. The metering, billing and cost recovery systems must be improved.
A steering committee should be setup to report on a monthly basis to council on water loss figures, leaks repaired, targets, progress, consumer metering, billing and cost recovery.
Proper metering, billing and cost recovery should be supported by community awareness that promotes reporting of leaks, fixing of private leaks and efficient use. Based on the available information, a target reduction in NRW of 63.1% down to 54.8% and target input volume reduction of 8.3% have been set. Review the water tariff structure to ensure it reflects true cost, promote WCWDM and work towards compliance with RPMS and improve WSDP.

Business Plan

The budget requirements for the next five years are summarised in the table below:

Intervention	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Institutional	675 000	175 000	275 000	175 000	175 000	1 475 000
Financial	67 009 600	66 909 600	66 909 600	66 809 600	66 809 600	334 448 000
Social	31 611 120	31 411 120	31 411 120	31 411 120	31 411 120	157 255 600
Technical	101 881 060	101 906 060	100 518 560	100 293 560	100 253 560	504 852 800
Total	**201 176 780**	**200 401 780**	**199 114 280**	**198 689 280**	**198 649 280**	**998 031 400**

Compliance

Results from the Regulatory Performance Measurement System (RPMS)

Key Performance Indicators	Achieved KPI Score	Required score	Performance assessment
KPI 1: Access to water supply	1.87	3	Concern
KPI 2: Access to sanitation	3.113	3	Adequate
KPI 3: Access to Free Basic Water	5	3	Excellent
KPI 4: Access to Free Basic Sanitation	0	3	Crisis
KPI 5: Drinking Water Quality management	1	3	Crisis
KPI 6: Wastewater quality management	0	3	Crisis
KPI 7: Customer service quality	3.5	3	Good
KPI 8: Institutional effectiveness	3.276	3.5	Concern
KPI 9: Financial performance	0.571	4	Crisis
KPI 10: Strategic asset management	3.375	3	Good
KPI 11: Water use efficiency	0	3	Crisis

Results from Blue and Green Drop Assessments

Assessment	2009	2010	2011	2012
Blue drop	36.50%	41.50%	45.06%	
Green drop	16.00%	-	14.20%	

WCWDM STRATEGY AND BUSINESS PLAN: Municipal Water Conservation and Water Demand Management Implementation Process Map

Strategy and Planning Phase

Performed by WCWDM Strategy Steering Committee (MEC, Municipal Manager, Technical and Financial Directors)
Reviewed by SSC and DWA

Vision

Water Services Act, 108 of 1997

Provide water services in an efficient, affordable, equitable, economical and sustainable manner to all consumers or potential consumers in its area of jurisdiction.

BIG HAIRY AND AUDACIOUS VISION
If it doesn't scare you, its not big enough

Mission

Presidential Target
(State of the Nation address 2010)

Reduce water Losses by half by 2014

Status Quo

Technical

Information on demographics, demands, water loss, level of service

Key water loss contributing factors

Key performance indicators and targets

Asset value and condition

Departmental organogram

Economic

Tariffs

Metering, billing and revenue collection status

Existing sources of funding

Social

Customer profile

Communication dynamics between WSA and consumers

Existing support structures for consumers

Level of stakeholder involvement

Institutional

Existence of approved policies

Existence of approved bylaws

Regulatory compliance

Legislative compliance

Strategy

Technical

SWOT Analysis : Strengths, **W**eaknesses, **Opportunities** & **T**hreats of technical department (human resources, processes,
Goals and objectives: Achieving water loss reduction target in terms of available resources and non-revenue water. If no target exists, then goal is to develop a target.
How : Identify key principles to achieve target (user pay, water restrictions, consumer education, etc.)
Actions : Responsible person, measurement and timelines to address SWOT analysis

Economic

SWOT Analysis : Strengths, **W**eaknesses, **Opportunities** and **T**hreats of funding sources
Goals and objectives: Allocate sufficient funding to address WCWDM
How : Identify key principles to obtain funding (improved metering and billing, cost recovery, external funding, etc.)
Actions : Responsible person, measurement and timelines to address SWOT analysis

Social

SWOT Analysis : Strengths, **W**eaknesses, **Opportunities** and **T**hreats of consumers and institution
Goals and objectives: Informed and supportive consumer and institution
How : Identify key principles to develop turn consumers into customers (political, schools, specific consumer groups, water wise, etc.)
Actions : Responsible person, measurements and timelines to address SWOT analysis

Institutional

SWOT Analysis : Strengths, **W**eaknesses, **Opportunities** and **T**hreats of policies, bylaws, political support , enforcement, Regulatory compliance
Goals and objectives: Reform organisation to support WCWDM
How : Identify key principles to obtain improve (improved political support, policies, enforcement, etc.)
Actions : Responsible person, measurement and

Business Plan

Technical

Bulk metering
Leakage control and repair
Sectorisation and zone metering
Logging and water loss monitoring
Non domestic and domestic metering and audits
Resolve intermittent supply
Pressure management
Clean out and recommission existing infrastructure
Training and capacity building

Economic

Review tariff structure
Ensure effective metering and billing system
Review CAPEX budget in terms of WDM goals
Review OPEX budget in terms of WDM goals
Develop business plan for external funding
Training and capacity building

Social

Raise awareness at political levels
Raise awareness at institutional levels
Identify and engage relevant stakeholders
Establish customer care centre
Training and capacity building
Conduct WC/WDM education and awareness
Conduct schools awareness campaigns

Institutional

Establish policies in terms of payment for services, arrears,
Establish bylaws that addresses water loss reduction and efficiency
Succession planning - ensure initiatives continue

Implementation

Performed by Department
Reviewed by SSC and DWA

Implementation

All Projects

Council approval of Strategy and Business Plan

Identify key stakeholders - setup working committees

Appoint PSP

Appoint contractor

Assess / determine baseline

Implement interventions

Project Quality Control

Project Financial Management

Establish record keeping and reporting processes

Assess benefits from implementation

Establish take-over procedure

Training and capacity building

Monitoring and Review

Performed by Department
Reviewed by SSC and DWA

Deliverables

Technical

Record keeping and reporting process
Monthly IWA Water Balance calculation for system and DMA
No visible leakage
Asset management
Comply with Regulations R509 of 2001
Responsible WCWDM individual/unit

Measurement against goals

Economic

Sufficient budget allocation
Realistic tariff setting
Efficient meter reading, billing and cost recovery process

Measurement against goals

Social

Political support
Institutional support
Informed, involved and supportive consumer

Measurement against goals

Institutional

Approved policies
Approved bylaws
Policy and bylaws enforcement
Regulatory compliance
Succession plan

Measurement aga als

Deliverables

Review and update strategy and business plan . Implement and regulate.

Detailed management information

DWA Planning and target setting, Review strategies and Business Plans and align with targets, Possible funding, Technical and Institutional Support, Develop generic Policies and bylaws, Develop Regulations and Regulate, Report to Presidency

WCWDM STRATEGY : Definitions

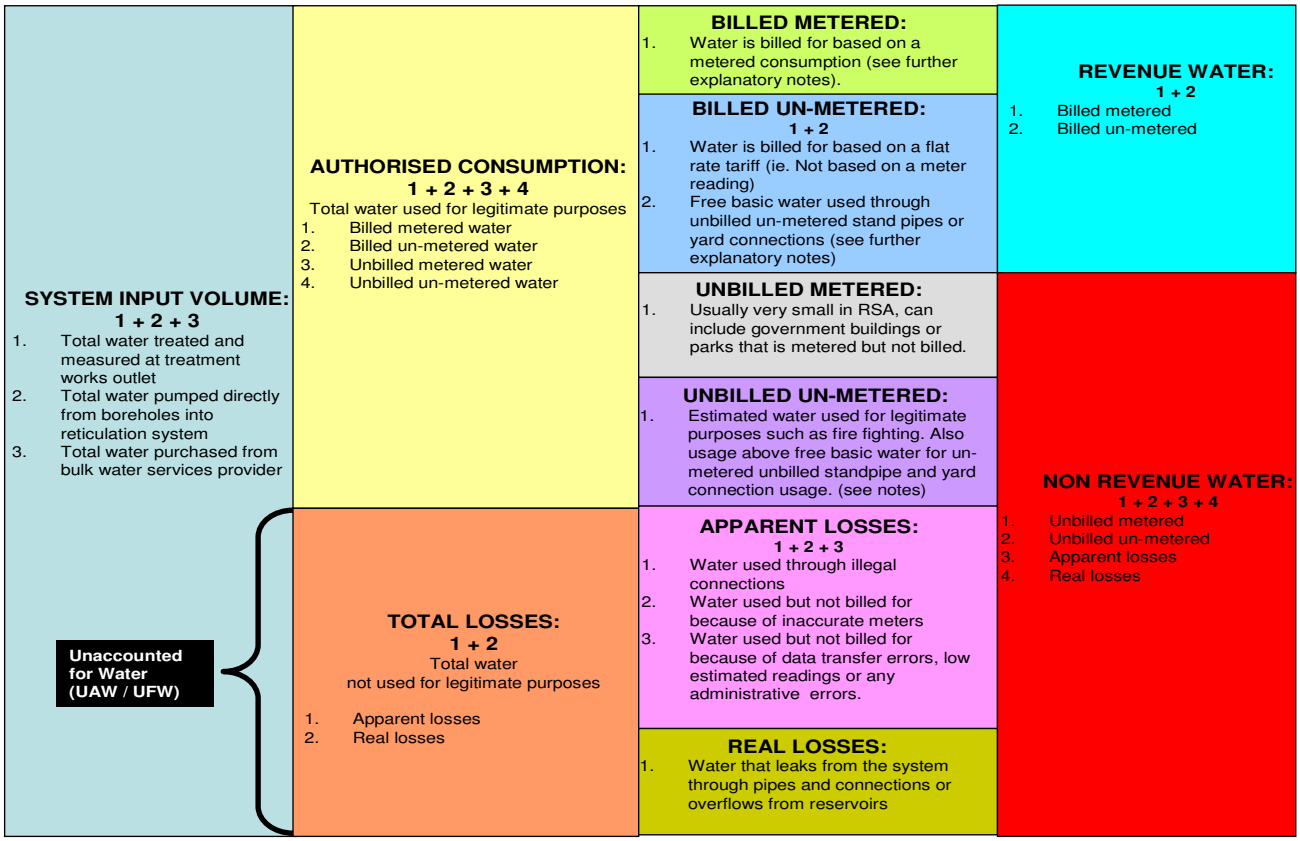
Terminology

Acronym	Description	Link
DWA	Department of Water Affairs	http://www.dwa.gov.za
WS RPMS	Water Services : Regulatory Performance Measurement System	http://www.dwa.gov.za/dir_ws/rpm/
WS NIS	Water Services : National Information System	http://www.dwa.gov.za/dir_ws/wsnis/
FBS	Water Services : Free Basic Water Project	http://www.dwaf.gov.za/dir_ws/fbw/
NRW	Non-revenue water. Volume of water for which no revenue is received (preferred term)	
UAW or UFW	Unaccounted-for water. Volume of water lost due to physical and apparent losses (not preferred term)	
StatsSA NFC	Statistics South Africa : Non-Financial Census of Municipalities P9115	http://www.statssa.gov.za/

Information sources

Item	Source	Calculation
Population	DWA WS NIS or municipality	
Households	DWA WS NIS or municipality	
Connections - metered	Extrapolated 2007 DWA - WS FBW serviced above RDP or municipality	
Connections - Unmetered	Extrapolated 2007 DWA - WS FBW serviced at RDP or municipality	
Length of mains (km)	Actual value or calculated at average of 50 connections / km of mains	# connections ÷ 50
(A) System input volume	Total volume of potable water supplied by the municipality in kl/annum	
(B) Billed metered consumption	Total volume of water metered and billed by the municipality in kl/annum	
(C) Billed unmetered consumption	Total volume of water unmetered and billed by the municipality in kl/annum	
Underlined values	Calculated values using trends or averages	

Standard IWA Water Balance



Apparent Losses

Illegal connections	%	Water Quality	Meter age and accuracy	%	Data transfer	%
Very high	10%	Very poor	> 10 years	10%	Very poor	9%
High	8%	Poor		8%	Poor	7%
Average	6%	Average	5- 10 years	6%	Average	5%
Low	4%	Good		4%	Good	3%
Very low	2%	Very good	< 5 years	2%	Very good	1%

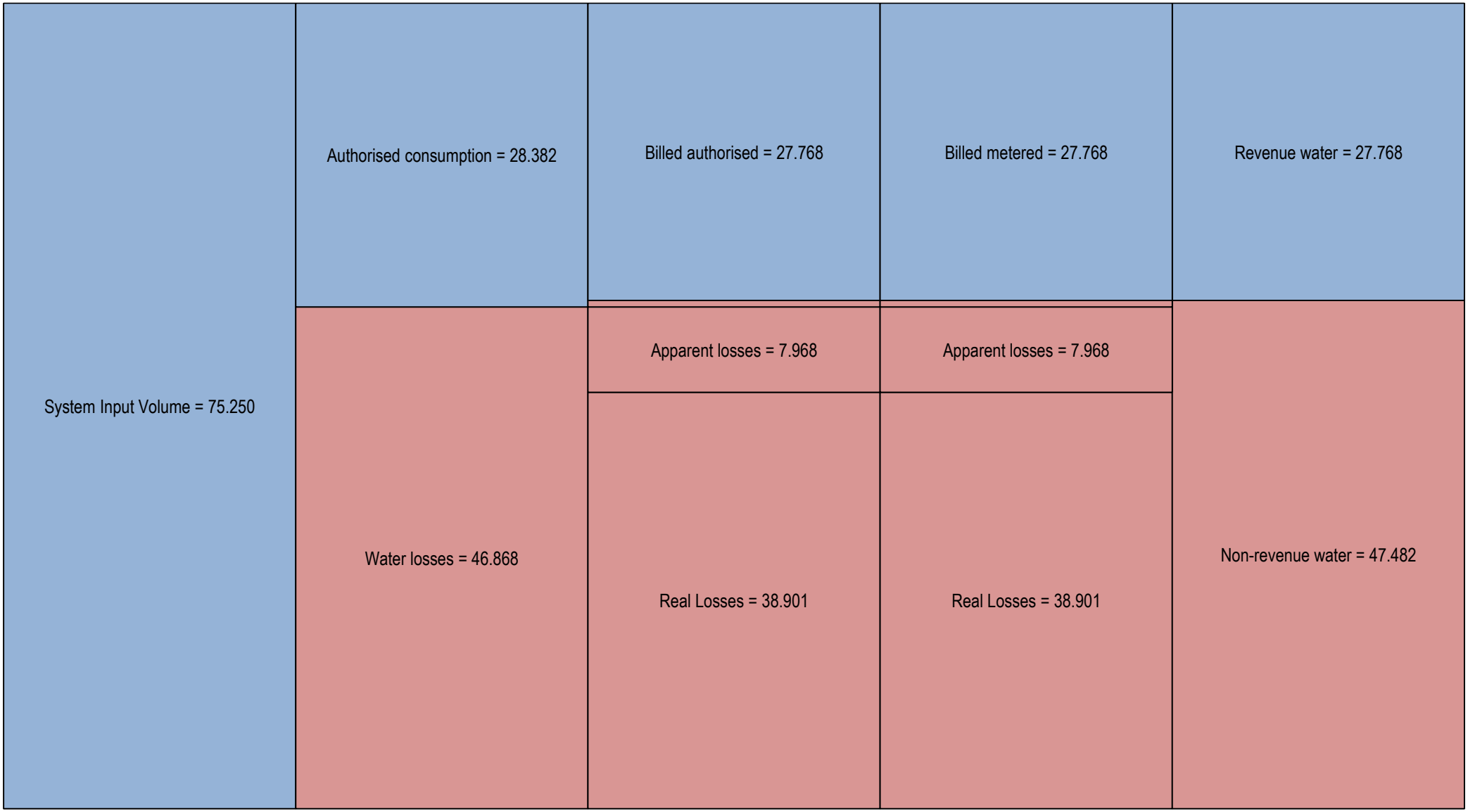
WCWDM STRATEGY : Base Information

Municipality name	Musina LM, Mutale LM, Thulamela LM, Makhado LM		Date of current data	2012
		Current	Target	Change
Input Data	**Demographics** WSDP Ref			
	Population Par 2.4	**No**	**1 179 296**	**1 179 296**	**0**
	Urban	No	176 894	176 894	
	Rural	No	1 002 402	1 002 402	
	Households Par 2.4	**No**	**270 352**	**270 352**	**0**
	Urban	No	40 553	40 553	
	Rural	No	229 799	229 799	
	Household density	**Pop / HH**	**4.70**	**4.36**	
	Growth rate: 5 years Par 4.1.3	**%**	**4.0%**	**4.0%**	**0**
	Consumer units Par 3.3	**No**	**238 196**	**238 196**	**0**
	Residential	No	237 047	237 047	
	Police stations	No	36	36	
	Magistrates Offices	No	11	11	
	Business	No		0	
	Dry industries	No		0	
	Office buildings	No		0	
	Prisons	No	3	3	
	Schools	No	967	967	
	Health facilities	No	132	132	
	Wet industries	No	0	0	
	Mining	No	1	1	
	Resorts and tourism	No		0	
	Infrastructure				
	Water Level of Service Par 3.1	**no**	**173 614**	**173 614**	**0**
	Stand pipes	HH	119 793	119 793	0
	Yard connections	HH	29 514	29 514	
	House connections	HH	24 307	24 307	
	Length of mains (km) Par 5.1.2	**km**	**1 875.0**	**1 875.0**	**0**
	Connections / km of mains	**No / km**	**92.6**	**92.6**	
	Average system pressure	**m**	**40**	**40**	**0**
	Time pressurised	**%**	**90%**	**100%**	**0**
	Sanitation Level of Service Par 3.2		**93 179**	**93 179**	**0**
	None water borne	No	74 228	74 228	
	Water borne low flush	No	0	0	
	Septic tanks / conservancy	No	7 980	7 980	
	Water borne - WTW	No	10 971	10 971	
	Apparent losses	**%**	**17%**	**17%**	**0%**
	Consumer meter age	**%**	**6%**	**6%**	**0%**
	Illegal connections	**%**	**6%**	**6%**	**0%**
	Data transfer	**%**	**5%**	**5%**	**0%**
	Water balance data				
	System input volume	**kℓ/annum**	**75 250 017**	**73 745 017**	**-1 505 000**
	Own sources	**kℓ/annum**	**75 250 017**	**73 745 017**	**-1 505 000**
	Other sources	**kℓ/annum**			**0**
	Billed metered consumption	**kℓ/annum**	**27 767 805**	**33 321 366**	**5 553 561**
	Billed unmetered consumption	**kℓ/annum**	**0**	**0**	**0**
	Unbilled metered consumption	**kℓ/annum**	**0**	**0**	**0**
	Unbilled unmetered consumption	**kℓ/annum**	**613 901**	**737 450**	**123 549**

	Water Tariffs						
	Purchase of bulk water		Par 10.2	R/annum	R 0	R 0	R 0.00
	Total operating cost			R/annum	R 106 130 427	R 106 130 427	R 0.00
	Rate - Purchase of bulk water			R/kℓ	#DIV/0!	#DIV/0!	
	Rate - Total operating			R/kℓ	R 1.41	R 1.44	
	Domestic Water Tariffs		Par 10.3				
	0	to	13	kℓ/month	R 8.80	R 8.80	R 0.00
	13	to	18	kℓ/month	R 10.18	R 10.18	R 0.00
	18	to	24	kℓ/month	R 11.63	R 11.63	R 0.00
	24	to	30	kℓ/month	R 12.58	R 12.58	R 0.00
	30	to	42	kℓ/month	R 13.46	R 13.46	R 0.00
	>	to	72	kℓ/month	R 14.41	R 14.41	R 0.00
Water Balance Calculations	System input volume			kℓ/annum	75 250 017	73 745 017	-1 505 000
	Authorised Consumption			kℓ/annum	28 381 706	34 058 816	5 677 110
	Billed authorised			kℓ/annum	27 767 805	33 321 366	5 553 561
	Billed metered			kℓ/annum	27 767 805	33 321 366	5 553 561
	Billed unmetered			kℓ/annum	0	0	0
	Unbilled authorised			kℓ/annum	613 901	737 450	123 549
	Unbilled metered			kℓ/annum	0	0	0
	Unbilled unmetered			kℓ/annum	613 901	737 450	123 549
	Water losses			kℓ/annum	46 868 311	39 686 200	-7 182 110
	Apparent losses			kℓ/annum	7 967 613	6 746 654	0
	Real losses			kℓ/annum	38 900 698	32 939 546	-7 182 110
	UARL			kℓ/annum	2 268 515	2 520 572	0
	Potential real loss saving			kℓ/annum	36 632 183	30 418 974	-7 182 110
	Revenue water			kℓ/annum	27 767 805	33 321 366	5 553 561
	Non-Revenue water			kℓ/annum	47 482 212	40 423 651	-7 058 561
Key Performance Indicators	System input volume unit consumption						
	litres / capita / day			ℓ / c / d	175	171	-4
	m³ / household / month			m³ / hh / month	23	23	0
	m³ / connection / month			m³ / conn / month	36	35	-1
	Authorised unit consumption						
	litres / capita / day			ℓ / c / d	66	79	13
	m³ / household / month			m³ / hh / month	9	10	1
	m³ / connection / month			m³ / conn / month	14	16	2
	Water loss indicators						
	UARL : Losses / connection / day			ℓ / conn / day	36	40	4
	CARL : Losses / connection / day			ℓ / conn / day	614	520	-94
	Infrastructure Leakage Index (ILI)			-	17.15	13.07	-4
	Losses / km mains / day			m³ / km / day	56.8	48.1	-9
	Non-revenue water			%	63.1%	54.8%	-8.3%
	Unbilled Consumption			%	0.8%	1.0%	0.2%
	Water Losses			%	62.3%	53.8%	-8.5%
	Apparent losses			%	10.6%	9.1%	-1.4%
	Real losses			%	51.7%	44.7%	-7.0%
	Water balance reduction targets						
	System input volume			%		-2.0%	
	Authorised Consumption			%		20.0%	
	Billed authorised			%		20.0%	
	Billed metered			%		20.0%	
	Billed unmetered			%		0.0%	
	Unbilled authorised			%		20.1%	
	Unbilled metered			%		0.0%	
	Unbilled unmetered			%		20.1%	
Cost Analysis	Average monthly water bill / connection			R / conn / month	R 125	R 145	R 20
	Estimated annual income			R / annum	R 259 545 985	R 301 963 358	R 42 417 372
	Total water supply cost			R / annum	R 106 130 427	R 106 130 427	R 0
	Net profit / loss			R / annum	R 153 415 558	R 195 832 931	R 42 417 372
	Town and description			Source	Ml/day	m^3/annum	million m^3/annum

Water Source and Treatment Capacity	Thulamela LM WTWs	Blue Drop 2011	115.46	42 142 900	42.143
	Makado LM WTWs	Blue Drop 2011	28.25	10 310 155	10.310
	Musina LM	NRW data	12.00	4 380 000	4.380
	Mutale LM	Blue Drop 2011	16.08	5 869 200	5.869
	Total		171.79	62 702 255	62.702

Current IWA Water Balance Diagram (million m^3/annum)

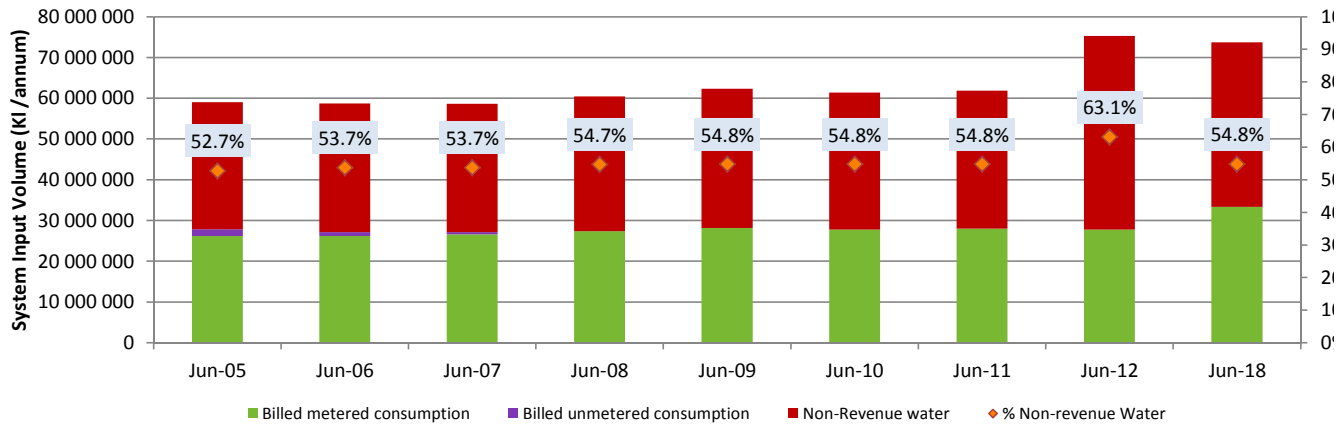


Target IWA Water Balance Diagram (million m^3/annum)

WCWDM STRATEGY : Water Balance History

Municipality Name	Musina LM, Mutale LM, Thulamela LM, Makhado LM

			Year ending	Jun-05	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	Jun-11	Jun-12
Input Data	Population			1 261 526	1 272 395	1 280 023	1 289 612	1 297 349	1 203 291	1 217 730	1 179 296
	Households			292 169	294 701	296 457	298 679	300 463	278 936	282 283	270 352
	Connections - metered			149 101	150 386	151 287	152 421	153 335	142 704	144 417	146 150
	Connections - Unmetered			83 158	83 877	84 375	85 009	85 515	79 208	80 158	81 120
	Length of mains (km)			4 645	4 685	4 713	4 749	4 777	4 777	4 834	4 892
	System input volume	kl/annum		58 999 243	58 733 455	58 600 977	60 460 419	62 319 860	61 390 139	61 855 000	75 250 017
	Billed metered consumption	kl/annum		26 234 339	26 184 081	26 565 174	27 366 928	28 168 682	27 767 805	27 968 244	27 767 805
	Billed unmetered consumption	kl/annum		1 649 304	986 976	559 195	0		0	0	0
	Unbilled metered consumption	kl/annum		0	0	0	0	0	0	0	0
	Unbilled unmetered consumption	kl/annum		589 992	587 335	586 010	604 604	623 199	613 901	618 550	752 500
Water Balance Calculations	Revenue water	kl/annum		27 883 643	27 171 057	27 124 369	27 366 928	28 168 682	27 767 805	27 968 244	27 767 805
	Non-Revenue water	kl/annum		31 115 600	31 562 398	31 476 608	33 093 491	34 151 178	33 622 334	33 886 756	47 482 212
	Water Losses	kl/annum		30 525 608	30 975 063	30 890 598	32 488 886	33 527 979	33 008 433	33 268 206	46 729 712
	% Non-revenue water			52.7%	53.7%	53.7%	54.7%	54.8%	54.8%	54.8%	63.1%
	% Water Losses			51.7%	52.7%	52.7%	53.7%	53.8%	53.8%	53.8%	62.1%
Key performance indicators	Input : Litres / capita / day			128	126	125	128	132	140	139	175
	Input: m³ / household / month			17	17	16	17	17	18	18	23
	Billed : Litres / capita / day			61	59	58	58	59	63	63	65
	Billed : m³ / household / month			8	8	8	8	8	8	8	9
	% Population growth				0.86%	0.60%	0.75%	0.60%	-7.25%	1.20%	-3.16%
	% Water demand growth				-0.45%	-0.23%	3.17%	3.08%	-1.49%	0.76%	21.66%
Source of information				DWA NIS StatsSA Adj	DWA NIS StatsSA Adj	DWA NIS StatsSA Adj	DWA NIS Estimated	DWA NIS WSDP	DWA NIS Estimated	DWA NIS Estimated	DWA NIS Estimated



Comments

Jun-18
1 492 186
342 082
184 926
102 643
6 190
73 745 017
33 321 366
0
0
737 450
33 321 366
40 423 651
39 686 200
54.8%
53.8%
135
18
61
8
7.01%
6.04%
Estimated

% Non-revenue Water
00%
0%
0%
0%
0%
0%
0%
0%
0%
0%
%

WCWDM STRATEGY : Qualitative Scorecard

Municipality Name	Vhembe

Introduction

The purpose of this section is to perform a qualitative evaluation of the municipality's water business. The objectives are as follows :

SWOT Analysis	External - Opportunities Positive external conditions which you don't control which you could take advantage of	External - Threats Negative conditions you don't control but could minimise their effects
Internal - Strengths Positive aspects under your control and on which you may wish to capitalise	Strengths and Opportunities (SO) – Strategies that use strengths to maximize opportunities.	Strengths and Threats (ST) – Strategies that use strengths to minimize threats.
Internal - Weaknesses Negative aspects under your control (to a large extent) which you could plan to improve	Weaknesses and Opportunities (WO) – Strategies that minimize weaknesses by taking advantage of opportunities.	Weaknesses and Threats (WT) – Strategies that minimize weaknesses and avoid threats.

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
1	**INSTITUTIONAL REVIEW**				
1.1	**Water and Sanitation department structure**				
1.1.1	Is there an approved organogram for the Water and Sanitation Department?	There are approved organograms in place.	O	Review the existing organogram and ensure that it incorporates WC/WDM personnel.	1
1.1.2	What is the vacancy rate in the department and is it a problem?	There is a vacancy rate of approximately 55%. Previously the District was not responsible for the water business. After the devolution of powers to the District, most of the staff was reaching retirement age amongst other challenges. Critical posts have been identified however funding is a challenge.	T	Advertise and fill the identified critical vacant posts. Engage with the Department of finance to identify and explore possible funding options and budget requirements for the critical posts.	1
1.1.3	Does the department have the correct technical skills for the correct posts.	90% of the people taken over by the municipality are general workers. There is a very limited technical skills base.	T	Increase management, and O&M capacity through new human resources and support it with WC/WDM training in all Local Municipalities within Vhembe District.	1
1.1.4	Is training and capacity building being done?	Training and capacity building has been undertaken to a limited extent through the DWA support programme. Older staff is difficult to train.	O	Institute a mandatory WC/WDM training programme for technical staff. Invest in team building and workshop sessions incorporating the councillors and municipal management to boost staff morale.	2
1.1.5	Are there sufficient support structures ito vehicles, equipment, materials etc.?	Materials and equipment are lacking. The subsidies collapse periodically which means that there is no funding for the tools and vehicles. The materials are not enough to service the 24 existing schemes with a staff base of approximately 1900.	T	Engage with the Department of Finance and allocate an adequate budget for the critical spares. Allocate a specific person who will be responsible for expediting equipment orders and managing quality control in terms of the procurement processes.	2

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
1.1.6	Does the municipality own any water loss control equipment such as loggers, listening sticks, etc.?	No loss control equipment.	O	It is recommended that loggers and simple leak detection equipment be purchased to improve water loss monitoring and management in the system.	3
1.2	**Municipal support**				
1.2.1	Describe the working relationship with other departments such as finance, planning, housing etc.?	There is a positive relationship between the Water and financial department. The challenge is the payment and cost recovery for water services. Water is used as a stick to get payment for other services. The challenge is prioritisation of the water business.	T	Establish a NRW steering committee comprising representatives from the technical, communications and finance departments to improve communication and access to information.	1
1.2.2	Are the politicians supporting the department?	The politicians do not have a proper understanding of the water business. Training and capacity building is required to assist with the implementation	T	Undertake a councillor WC/WDM induction programme to capitalise on the existing relationship and build a communication bridge between the municipality and the customers.	2
1.3	**Public Private Partnerships**				
1.3.1	Is there any major industrial or institutional role player in the area and is there co-operation?	In Musina there is the Venesia Mine as well as mines in Makhado. The industries have never been engaged previously.	O	Identify any other additional role players through the top consumer monitoring and conduct courtesy visits as a first phase of the programme. Establish a stakeholder forum if practicable and encourage the participation of the big industries in the forum.	2
1.3.2	If yes, what does the co-operation involve and can it be expanded?				
1.4	**Legislation and bylaws**				
1.4.1	Does the municipality have a customer service charter?	No customer charter is in place for the District but all the Local Municipalities have it.	S	Publicise the existing customer service charters to ensure the customers are aware of the municipalities commitment and their responsibilities as consumers.	3
1.4.2	What is the status and age of the existing bylaws and do they address water loss management?	Draft bylaws are in place but they have not been gazetted yet. No previous bylaws are in place or in use. The bylaws will be the same across all local municipalities. WDM has not been specifically addressed in the bylaws.	T	Review the bylaws and utilise the process to ensure that WC/WDM issues are captured and addressed by the bylaws.	2
1.4.3	Are bylaws enforced and if not, why not?	The bylaws are not enforced.	O	Develop partnerships with the credit control and legal departments as well as the SAPS and put appropriate bylaw enforcement mechanisms in place.	2
1.4.4	What is the status and age of Water Services Development Plan?	Latest WDSP obtained for 2010 in draft form.	S	Continuously update the WSDP on an annual basis.	1
2	**FINANCIAL REVIEW**				
2.1	**Financial Department**				
2.1.1	What is your opinion of the Finance Department's ability to perform metering and billing	There is generally limited capacity for metering and billing due to limited staff capacity. External service providers were obtained but efficiency is lacking.	T	Improve communication and access to information between the technical and finance department through scheduled monthly team meetings.	1
2.1.2	Is training and capacity building being done?	There is limited training and capacity building for the financial staff.			
2.1.3	What is the state of the municipal metering and billing system?				

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
2.1.4	What is your primary source of funding?	Conditional grants are the primary source of funding. Without them services cannot be sustained.	T	Focus on improving metering and billing and cost recovery where practicable to reduce dependency on grant funding.	2
2.2	**Tariffs**				
2.2.1	Who prepares the water tariffs and what is it based on?	The tariffs are prepared by the District but no specific method is used to prepare them.	O	Ensure that the technical department continuously makes inputs into the tariff setting process.	1
2.2.2	What is the tariff structure and does it promote WCWDM?	The Municipality utilises a rising block tariff.	O	Ensure that the rising block tariff is sufficiently differentiated in cost at each level to promote WC/WDM with the highest tariff at least twice the amount of the lowest tariff. Obtain and utilise the National Treasury tariff setting guidelines.	1
2.2.3	Is the water supplied considered affordable by the customers?	The consumers do consider the water affordable. They are able to pay for water.	S	Continue ensuring that the tariffs remain affordable particularly for the efficient and low income water users.	1
2.3	**Meter Reading and Billing**				
2.3.1	Who performs the water meter readings, frequency and accuracy?	The local municipality performs the meter readings in-house on a monthly. The external service providers are assisting with improving the accuracy of the readings.	T	Monitor the frequency and accuracy of meter reading through the customer complaints system.	1
2.3.2	Are the meter readers trained and can they report leakage when encountered on site?	The meter readers are able to report leakage.	O	Continue providing training for the meter readers on an annual basis particularly on site training based on feedback from the consumers.	2
2.3.3	Is the water bill understandable and informative?	The water bills are comprehensible.	O	Consider including water conservation tips and information in the water bill. It is also recommended to display 6 months graphical consumption data on the bill to aid consumers in effectively monitoring water use.	3
2.4	**Credit control**				
2.4.1	Is credit control being implemented and by whom?	The local municipalities perform credit control as the WSP' s.	T	Through the legal department, develop appropriate credit control enforcement mechanisms to improve revenue recovery.	2
2.4.2	What is the current level of non-payment?	The Level of non payment is generally significantly high.	O	Focus on promoting payment for services in the metered areas through the councillors and education and awareness.	2
3	**SOCIAL REVIEW**				
3.1	**Customer profile**				
3.1.1	Describe the general consumer profile i.e. Income levels, indigence, unemployment, literacy	80% of consumption is domestic and a large number of the residents are indigent.	O	Focus on educating the indigent population on efficient water use and the importance of the free basic allocation as well as its limitations.	1
3.1.2	Describe the relationship between customers and the municipality and reasons?	The relationship between the municipality and the consumers is contentious.	T	Engage with the consumers through the councillors and gain their support and cooperation whilst the municipality resolves the water services challenges. Build on the relationship with all the consumers and strengthen it through community awareness campaigns.	1
3.2	**Customer awareness**				

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
3.2.1	Are consumers informed regarding the value of water?	People don't believe in conserving water in this District.	T	Budget and undertake a continuous annual education and awareness campaign focusing on promoting water use efficiency.	2
3.2.2	What is the level of leakage reporting by the community and what method do they use?	The community generally does not report leakage.	T	Publicise the customer care services through the councillors, pamphlets attached to water bills and local media to promote reporting of leakage.	2
3.2.3	What are the most prominent consumer behavioural challenges encountered by the municipality?	Illegal connections are a big problem in the municipality. People are building bigger houses and want a higher level of service. The Municipality is however on intermittent supply every day between 16:00 and 4:00 am with most of the water schemes shut off at this time.	T	The community awareness campaign should be tailored to address these problems. The councillors should be encouraged to make these issues an agenda at all public meetings held in the different wards.	1
3.2.4	Is xeriscaped gardening and rain water harvesting encouraged?	There is currently no promotion of xeriscaped gardening in the District.	O	As part of a community awareness campaign, encourage consumers to harvest rain water and utilise it for garden irrigation and cleaning to reduce the demand for potable water.	2
3.2.5	Are radio campaigns, bill board, pamphlets, informative billing used to inform and educate customers?	On an adhoc basis, radio campaigns do take place.	O	Develop simple visual material in the form of pamphlets which can be used to educate consumers on efficient water use. Build on the media campaign undertaken and periodically publicise water tips on local radio stations and newspapers.	2
3.3	**Schools awareness**				
3.3.1	Number of primary and secondary schools?				
3.3.2	Frequency and scope of schools awareness campaigns?	There is no schools awareness taking place.	O	Establish a relationship with schools. Monitor their consumption on a monthly basis and undertake education and awareness. Huge benefit can be derived from this. The section 21 schools in particular should be visited, monitored and encouraged to fix leakage as the O&M budgets are operated by the school management for this category of schools. Engage with the schools through workshops and promote water conservation in the education sector.	2
3.3.3	Are goals and objectives monitored and controlled?				
3.4	**Customer Care Centre**				
3.4.1	Does the municipality have a CCC and who operates it?				
3.4.2	How and to whom are billing queries referred?				
3.4.3	To whom are the leak reports referred and do consumers have confidence in the reporting system?				
4	**TECHNICAL REVIEW**				
4.1	**Measurement and control**				

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
4.1.1	Is the system input volume measured, monitored and controlled?	The meters at approximately 9-12 of the treatment works are read on a monthly basis. The boreholes are also monitored in terms of quality and yield.	O	Continue to read the bulk meters on a monthly basis and monitor the input volumes. Install bulk meters at all unmetered bulk connections and capture all the readings on a spread sheet to be updated on a monthly basis.	1
4.1.2	Is the water supply system sectorised into zones and districts?	No sectorisation has taken place.	T	Sectorise the water supply system into manageable sized areas or zones to enable improved monitoring of the system.	1
4.1.3	Are the supply to the zones and districts metered?	There are no zone meters in place.	T	Install zone meters and ensure that they are read on a monthly basis. The readings must be captured on a spread sheet.	1
4.1.4	Is the system monitored through a telemetry system?				
4.1.5	What is the Frequency and detail of your water balance calculation?				
4.1.6	Are minimum night flows, consumption trends and logging used to monitor the system?				
4.1.7	Are monthly management reports prepared and key performance indicators measured?				
4.2	**Physical leakage**				
4.2.1	What is the average age of the network, pipe material, replacement programme?	The network is old with mostly asbestos cement pipes. A replacement programme is planned for the District.	T	Set aside 5% of the CAPEX budget for the replacement of the network.	1
4.2.2	Number of burst pipes reported and repaired per week / month and the average response time?				
4.2.3	What is the primary cause of burst pipes?	The primary cause is the age of the network. Most of the pipes have reached their life span. There is also no pressure management taking place.	T	Allocate a proper budget for replacement and refurbishment. Budget a minimum of 5% of the infrastructure value for this purpose to reduce the risk of system failure.	1
4.2.4	Are active leak detection programmes conducted?				
4.2.5	How often and for how long do reservoirs overflow?	Some of the reservoirs overflow but not often because of the general shortage of water.	W	Acquire appropriate real time telemetry systems to monitor the reservoirs.	1
4.2.6	Are water losses from treatment processes (backwash, etc.) monitored and minimised?				
4.2.7	Is leakage on private properties a problem and if so, why?	Leakage on private properties is a problem because people don't pay for water.	T	Consider undertaking an extended and coordinated leak repair programme on indigent properties to rapidly and drastically decrease NRW.	1
4.2.8	Are leaks on indigent private properties repaired and removal of wasteful devices encouraged?	The leaks on private properties are not repaired by the municipalities with the exception of government buildings.	T	Undertake an internal leak audit in critical areas to accurately determine the extent of water losses and do a cost benefit analysis to assess the merit of carrying out a coordinated annual leak repair programme for indigent consumers.	1
4.3	**Pressure management and control valves**				
4.3.1	What is the average and maximum system pressure?				
4.3.2	Is basic or advanced pressure management being implemented?				
4.3.3	Are control valves pro-actively being maintained to prevent overflowing reservoirs?				
4.4	**Consumer metering**				
4.4.1	Are domestic and non-domestic consumers metered and which type of meter is used?	60% of non domestic properties are metered and 70% of domestic properties are metered. Most of the meters have been recently replaced so they are working.	O	Meter and bill 100% of non domestic connections as a priority and increasingly meter and bill the domestic consumers where practicable to increase revenue water.	1

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY
4.4.2	What is the condition, age and accuracy of water meters?				
4.4.3	Are the top consumers pro-actively monitored on a monthly basis?	The big consumers are being monitored.	S	Continue to monitor the top consumers and conduct this on a monthly basis. Undertake a top consumer audit and ensure that all connections are metered and billed.	1
4.4.4	Describe the water quality and its impact on consumer water meters?				
4.4.5	What is the prevalence and control of illegal connections?				
4.5	**Management information**				
4.5.1	Does the Municipality have an asset register and asset management programme?	There is an asset register but it does not contain assets inherited from DWA.	O	Review the asset register system in place. Maintain and update the asset register on an annual basis. Ensure that the asset register provides critical technical information such as the age, value and replacement date of the assets.	2
4.5.2	What is the status and age of as-built drawings?	As built drawings of the new projects are available but not of the old schemes.	T	Develop electronic as built drawings for the whole network.	2

Summary

SWOT Analysis	Helpful	Harmful
Internal factors (Staff, infrastructure, tools, equipment)	Approved organogram in place Monitoring of top consumers Customer Service Charters in all the LM's	Very high vacancy rate - lack of capacity No water loss equipment No proactive monitoring of water losses in zones Limited bulk metering No Sectorisation and zone metering
Internal factors (Politics, finance, consumers, economics)	Good relationship with finance but can improve Community and schools Awareness Councillor training programme Review charters, policies and bylaws to promote WDM Metering of all non domestic consumers	Very old infrastructure Insufficient vehicles and material to support O&M Dependency on grant funding Uninformed community Illegal connections High levels of leakage on private properties Poor relationship with consumers Uninformed councillors

WCWDM STRATEGY : Quantitative Scorecard

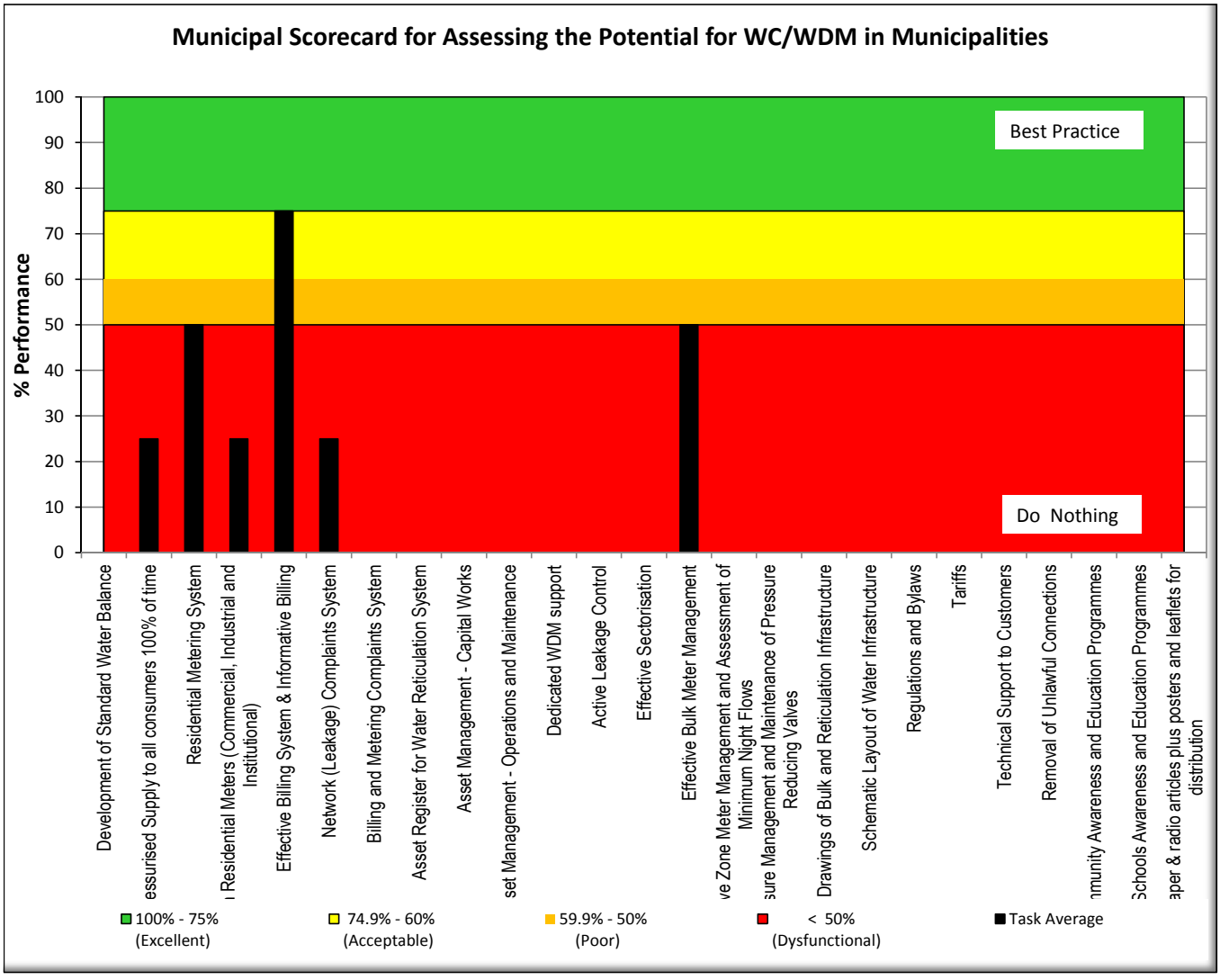
Municipality Name	Musina LM, Mutale LM, Thulamela LM, Makhado LM

Introduction

The purpose of the Water Conservation / Water Demand Management (WC/WDM) Scorecard is to ascertain the status quo of WC/WDM and evaluate the potential for WC/WDM measures to be implemented in these systems. The scorecard is also designed to enable the Regulator (Department of Water Affairs) to assess the current situation regarding losses and levels of wastage in all water supply systems countrywide. The scorecard consists of 25 multiple choice questions with each question getting scored from 0 to 4. The Regulator and WSA can track progress with each year the scorecard gets completed. Each question ends with an audit requirement which indicates what will be required by the Regulator should the questionnaire be audited. It also provides an indication on what is required in terms of each of the measures.

Date	Jun-10	Jun-11			Average
1. Development of Standard Water Balance	0				0
2. Pressurised supply to all consumers 100% of time	1				1
3. Residential Metering System	2				2
4. Non Residential Meters (Commercial, Industrial and Institutional)	1				1
5. Effective Billing System & Informative Billing	3				3
6. Network (Leakage) Complaints System	1				1
7. Billing and Metering Complaints System	0				0
8. Asset Register for Water Reticulation System	0				0
9. Asset Management - Capital Works	0				0
10. Asset Management - Operations and Maintenance	0				0
11. Dedicated WDM support	0				0
12. Active Leakage Control	0				0
13. Effective Sectorisation	0				0
14. Effective Bulk Meter Management	2				2
15. Effective Zone Meter Management and Night Flow Analysis	0				0
16. Pressure Management and Maintenance of Pressure Reducing Valves	0				0
17. As-Built Drawings of Bulk and Reticulation Infrastructure	0				0
18. Schematic Layout of Water Infrastructure	0				0
19. Regulations and Bylaws	0				0

Date	Jun-10	Jun-11			Average
20. Tariffs	0				0
21. Technical Support to Customers	0				0
22. Removal of Unlawful Connections	0				0
23. Community Awareness and Education Programmes	0				0
24. Schools Awareness and Education Programmes	0				0
25. Newspaper & radio articles plus posters and leaflets for distribution	0				0
Total score (maximum 100)	10		0	0	10



WCWDM STRATEGY AND BUSINESS PLAN : BUDGET AND CASH FLOW

Municipality name	Musina LM, Mutale LM, Thulamela LM, Makhado LM

COSTS

Item		Unit	Quantity / year	Rate	Year 1	Year 2	Year 3	Year 4	Year 5	Total
INSTITUTIONAL / LEGISLATIVE INTERVENTIONS										
Institutional review:					50%	50%				100%
CAPEX	Review organogram and fill vacancies	Sum	4	R 200 000	R 400 000	R 400 000	R 0	R 0	R 0	R 800 000
OPEX		Sum			R 0	R 0	R 0	R 0	R 0	R 0
Training and education :					50%	50%				
CAPEX	Not applicable	No		R 0	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Assume one training course / employee / annum	No	100	R 5 000	R 500 000	R 500 000	R 500 000	R 500 000	R 500 000	R 2 500 000
Customer charter, policy, bylaws :						100%				100%
CAPEX	Review bylaws on 5 year cycles	Sum	1	R 200 000	R 0	R 200 000	R 0	R 0	R 0	R 200 000
OPEX	Enforce bylaws	Sum	1	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 500 000
FINANCIAL INTERVENTIONS										
Effective metering and billing :					50%	50%				100%
CAPEX	Perform meter audit	No		R 0	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Ensure proper metering and billing of all consumers	No	173 614	R 100	R 17 361 400	R 17 361 400	R 17 361 400	R 17 361 400	R 17 361 400	R 86 807 000
Water tariffs :					50%	50%				100%
CAPEX	Review water tariffs	Sum	4	R 200 000	R 400 000	R 400 000	R 0	R 0	R 0	R 800 000
OPEX	Not applicable	Sum		R 0	R 0	R 0	R 0	R 0	R 0	R 0
Informative billing :					50%	50%				100%
CAPEX	Improve invoice to show monthly consumption	Sum	4	R 200 000	R 400 000	R 400 000	R 0	R 0	R 0	R 800 000
OPEX	Distribute information with bill	Sum	173 614	R 120	R 20 833 680	R 20 833 680	R 20 833 680	R 20 833 680	R 20 833 680	R 104 168 400
SOCIAL INTERVENTIONS										
Consumer Awareness Campaign :					20%	20%	20%	20%	20%	100%
CAPEX	Install bill boards, design pamphlets, radio campaigns	Sum	173 614	R 120	R 4 166 736	R 4 166 736	R 4 166 736	R 4 166 736	R 4 166 736	R 20 833 680
OPEX	Target households on monthly basis with awareness cam	No	173 614	R 60	R 10 416 840	R 10 416 840	R 10 416 840	R 10 416 840	R 10 416 840	R 52 084 200
Consumer Help and Support Desk :					50%	50%				100%
CAPEX	Improve existing help-desk to provide one-stop service	Sum	4	R 200 000	R 400 000	R 400 000	R 0	R 0	R 0	R 800 000
OPEX	Maintain help-desk	Sum	4	R 100 000	R 400 000	R 400 000	R 400 000	R 400 000	R 400 000	R 2 000 000
Schools awareness :					50%	50%				100%
CAPEX	Prepare schools competition, awareness, retrofit	No	967	R 20 000	R 9 670 000	R 9 670 000	R 0	R 0	R 0	R 19 340 000
OPEX	Monthly schools awareness campaign	No	967	R 2 000	R 1 934 000	R 1 934 000	R 1 934 000	R 1 934 000	R 1 934 000	R 9 670 000

TECHNICAL INTERVENTIONS										
Bulk metering :					50%	50%				100%
CAPEX	New meter installations required	No	86	R 50 000	R 2 150 000	R 2 150 000	R 0	R 0	R 0	R 4 300 000
OPEX	Maintenance of existing bulk meters	No	17	R 1 000	R 17 200	R 17 200	R 17 200	R 17 200	R 17 200	R 86 000
Sectorisation :					50%	50%				100%
CAPEX	Setup of new DMA / PMAs	No	86	R 50 000	R 2 150 000	R 2 150 000	R 0	R 0	R 0	R 4 300 000
OPEX	Maintenance of DMA / PMAs including step testing	No	86	R 25 000	R 2 150 000	R 2 150 000	R 2 150 000	R 2 150 000	R 2 150 000	R 10 750 000
Active Leakage Control :					50%	50%				100%
CAPEX	Not applicable	No		R 0	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Fix all visible and reported leaks	No	1 875	R 1 000	R 1 875 000	R 1 875 000	R 1 875 000	R 1 875 000	R 1 875 000	R 9 375 000
Valve audits					50%	50%				100%
CAPEX	Locate, clean, repair, document network valves	No	7 500	R 4 000	R 15 000 000	R 15 000 000	R 0	R 0	R 0	R 30 000 000
OPEX	Maintain network valves	No	1 500	R 1 000	R 1 500 000	R 1 500 000	R 1 500 000	R 1 500 000	R 1 500 000	R 7 500 000
Leak and logging equipment :					50%	50%				100%
CAPEX	Procure basic WDM equipment	Sum	8	R 20 000	R 80 000	R 80 000	R 0	R 0	R 0	R 160 000
OPEX	Not applicable	Sum			R 0	R 0	R 0	R 0	R 0	R 0
Telemetry :						50%	50%			100%
CAPEX	Install telemetry sites	No	30	R 15 000	R 0	R 225 000	R 225 000	R 0	R 0	R 450 000
OPEX	Maintain telemetry sites	No	30	R 1 500	R 45 000	R 45 000	R 45 000	R 45 000	R 45 000	R 225 000
Retrofitting and removal of wasteful devices :					20%	20%	20%	20%	20%	100%
CAPEX	Retrofit government buildings, schools, etc.	No	17 361	R 1 000	R 3 472 280	R 3 472 280	R 3 472 280	R 3 472 280	R 3 472 280	R 17 361 400
OPEX	Not applicable	No		R 0	R 0	R 0	R 0	R 0	R 0	R 0
Mains replacement :					20%	20%	20%	20%	20%	100%
CAPEX	Replace critical leaking mains	km	37.5	R 100 000	R 750 000	R 750 000	R 750 000	R 750 000	R 750 000	R 3 750 000
OPEX	Not applicable	km		R 0	R 0	R 0	R 0	R 0	R 0	R 0
Pressure management :					20%	80%				100%
CAPEX	New pressure management installations	No	10	R 75 000	R 150 000	R 600 000	R 0	R 0	R 0	R 750 000
OPEX	Maintain pressure management installations	No	20	R 5 000	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 500 000
Control valve management :					50%	50%				100%
CAPEX	New control valve installations	No		R 0	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Maintain all control valve installations	No	30	R 5 000	R 150 000	R 150 000	R 150 000	R 150 000	R 150 000	R 750 000
Consumer metering :						25%	25%	25%	25%	100%
CAPEX	Replacement of old water meters	No	17 316	R 1 200	R 0	R 5 194 920	R 5 194 920	R 5 194 920	R 5 194 920	R 20 779 680
OPEX	Replacement of broken and cycled water meters	No	8 681	R 1 200	R 10 416 840	R 10 416 840	R 10 416 840	R 10 416 840	R 10 416 840	R 52 084 200
Top consumer audit :					20%	20%	20%	20%	20%	100%
CAPEX	Audit and retrofit non domestic consumers	No	8 681	R 10 000	R 17 361 400	R 17 361 400	R 17 361 400	R 17 361 400	R 17 361 400	R 86 807 000
OPEX	Maintain non domestic consumers installations	No	8 681	R 500	R 4 340 350	R 4 340 350	R 4 340 350	R 4 340 350	R 4 340 350	R 21 701 750
GIS / CAD system :					50%	50%				100%
CAPEX	Setup CAD/ GIS system	Sum	4	R 200 000	R 400 000	R 400 000	R 0	R 0	R 0	R 800 000
OPEX	Maintain CAD / GIS system	Sum	4	R 200 000	R 800 000	R 800 000	R 800 000	R 800 000	R 800 000	R 4 000 000
Management Information System :					50%	50%				100%

CAPEX	Setup basic MIS system to support WDM	Sum	4	R 200 000	R 400 000	R 400 000	R 0	R 0	R 0	R 800 000
OPEX	Maintain MIS system	Sum	4	R 100 000	R 400 000	R 400 000	R 400 000	R 400 000	R 400 000	R 2 000 000
Water loss monitoring and audits:						50%	50%			100%
CAPEX	Perform proper analysis of distribution network	Sum	4	R 200 000	R 0	R 400 000	R 400 000	R 0	R 0	R 800 000
OPEX	Perform ad hoc analysis to monitor interventions	Sum	4	R 20 000	R 80 000	R 80 000	R 80 000	R 80 000	R 80 000	R 400 000

Item	Type		Year 1	Year 2	Year 3	Year 4	Year 5	Total
TOTAL COSTS								
Institutional	CAPEX		R 400 000	R 600 000	R 0	R 0	R 0	R 1 000 000
	OPEX		R 600 000	R 600 000	R 600 000	R 600 000	R 600 000	R 3 000 000
	TOTAL		**R 1 000 000**	**R 1 200 000**	**R 600 000**	**R 600 000**	**R 600 000**	**R 4 000 000**
Financial	CAPEX		R 800 000	R 800 000	R 0	R 0	R 0	R 1 600 000
	OPEX		R 38 195 080	R 38 195 080	R 38 195 080	R 38 195 080	R 38 195 080	R 190 975 400
	TOTAL		**R 38 995 080**	**R 38 995 080**	**R 38 195 080**	**R 38 195 080**	**R 38 195 080**	**R 192 575 400**
Social	CAPEX		R 14 236 736	R 14 236 736	R 4 166 736	R 4 166 736	R 4 166 736	R 40 973 680
	OPEX		R 12 750 840	R 12 750 840	R 12 750 840	R 12 750 840	R 12 750 840	R 63 754 200
	TOTAL		**R 26 987 576**	**R 26 987 576**	**R 16 917 576**	**R 16 917 576**	**R 16 917 576**	**R 104 727 880**
Technical	CAPEX		R 41 913 680	R 48 183 600	R 27 403 600	R 26 778 600	R 26 778 600	R 171 058 080
	OPEX		R 21 874 390	R 21 874 390	R 21 874 390	R 21 874 390	R 21 874 390	R 109 371 950
	TOTAL		**R 63 788 070**	**R 70 057 990**	**R 49 277 990**	**R 48 652 990**	**R 48 652 990**	**R 280 430 030**
Total	CAPEX		R 57 350 416	R 63 820 336	R 31 570 336	R 30 945 336	R 30 945 336	R 214 631 760
	OPEX		R 73 420 310	R 73 420 310	R 73 420 310	R 73 420 310	R 73 420 310	R 367 101 550
	TOTAL		**R 130 770 726**	**R 137 240 646**	**R 104 990 646**	**R 104 365 646**	**R 104 365 646**	**R 581 733 310**
			R 130 770 726	R 137 240 646	R 104 990 646	R 104 365 646	R 104 365 646	

BENEFITS

Item	Unit	Quantity	Rate	Year 1	Year 2	Year 3	Year 4	Year 5	Total
CHANGE IN CONSUMPTION									
Reduced input volume				20%	40%	60%	80%	100%	300%
Volume	m^3/annum	1 505 000		301 000	602 000	903 000	1 204 000	1 505 000	4 515 000
Amount	R / annum	1 505 000	R 2.00	R 602 000	R 1 204 000	R 1 806 000	R 2 408 000	R 3 010 000	R 9 030 000
Increased revenue water				20%	40%	60%	80%	100%	300%
Volume	m^3/annum	5 554 000		1 110 800	2 221 600	3 332 400	4 443 200	5 554 000	16 662 000
Amount	R / annum	5 554 000	R 4.00	R 4 443 200	R 8 886 400	R 13 329 600	R 17 772 800	R 22 216 000	R 66 648 000
Total	**R / annum**			**R 5 045 200**	**R 10 090 400**	**R 15 135 600**	**R 20 180 800**	**R 25 226 000**	**R 75 678 000**

Payback period - years 7.7

WCWDM STRATEGY AND BUSINESS PLAN : BUDGET AND CASH FLOW

COSTS							
	Unit	Year 1	Year 2	Year 3	Year 4	Year 5	Total
INSTITUTIONAL / LEGISLATIVE INTERVENTIONS							
Institutional review:		50%	50%				100%
CAPEX	Sum	R 800 000	R 0	R 0	R 0	R 0	R 800 000
OPEX	Sum	R 0	R 0	R 0	R 0	R 0	R 0
Training and education :		50%	50%				
CAPEX	No	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	No	R 225 000	R 225 000	R 225 000	R 225 000	R 225 000	R 1 125 000
Customer charter, policy, bylaws :			100%				100%
CAPEX	Sum	R 0	R 0	R 800 000	R 0	R 0	R 800 000
OPEX	Sum	R 400 000	R 400 000	R 400 000	R 400 000	R 400 000	R 2 000 000
FINANCIAL INTERVENTIONS							
Effective metering and billing :		50%	50%				100%
CAPEX	No	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	No	R 30 596 100	R 30 596 100	R 30 596 100	R 30 596 100	R 30 596 100	R 152 980 500
Water tariffs :		50%	50%				100%
CAPEX	Sum	R 400 000	R 0	R 400 000	R 0	R 0	R 800 000
OPEX	Sum	R 0	R 0	R 0	R 0	R 0	R 0
Informative billing :		50%	50%				100%
CAPEX	Sum	R 400 000	R 400 000	R 0	R 0	R 0	R 800 000
OPEX	Sum	R 36 715 320	R 36 715 320	R 36 715 320	R 36 715 320	R 36 715 320	R 183 576 600
SOCIAL INTERVENTIONS							
Consumer Awareness Campaign :		20%	20%	20%	20%	20%	100%
CAPEX	Sum	R 7 343 064	R 7 343 064	R 7 343 064	R 7 343 064	R 7 343 064	R 36 715 320
OPEX	No	R 18 357 660	R 18 357 660	R 18 357 660	R 18 357 660	R 18 357 660	R 91 788 300
Consumer Help and Support Desk :		50%	50%				100%
CAPEX	Sum	R 800 000	R 0	R 0	R 0	R 0	R 800 000
OPEX	Sum	R 400 000	R 400 000	R 400 000	R 400 000	R 400 000	R 2 000 000
Schools awareness :		50%	50%				100%
CAPEX	No	R 2 928 000	R 2 928 000	R 2 928 000	R 2 928 000	R 2 928 000	R 14 640 000
OPEX	No	R 1 464 000	R 1 464 000	R 1 464 000	R 1 464 000	R 1 464 000	R 7 320 000

TECHNICAL INTERVENTIONS							
Bulk metering :		50%	50%				100%
CAPEX	No	R 125 000	R 125 000	R 0	R 0	R 0	R 250 000
OPEX	No	R 20 000	R 20 000	R 20 000	R 20 000	R 20 000	R 100 000
Sectorisation :		50%	50%				100%
CAPEX	No	R 200 000	R 200 000	R 0	R 0	R 0	R 400 000
OPEX	No	R 300 000	R 300 000	R 300 000	R 300 000	R 300 000	R 1 500 000
Active Leakage Control :		50%	50%				100%
CAPEX	No	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	No	R 2 575 000	R 2 575 000	R 2 575 000	R 2 575 000	R 2 575 000	R 12 875 000
Valve audits		50%	50%				100%
CAPEX	No	R 8 240 000	R 8 240 000	R 8 240 000	R 8 240 000	R 8 240 000	R 41 200 000
OPEX	No	R 2 060 000	R 2 060 000	R 2 060 000	R 2 060 000	R 2 060 000	R 10 300 000
Leak and logging equipment :		50%	50%				100%
CAPEX	Sum	R 40 000	R 40 000	R 40 000	R 40 000	R 0	R 160 000
OPEX	Sum	R 0	R 0	R 0	R 0	R 0	R 0
Telemetry :			50%	50%			100%
CAPEX	No	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	No	R 0	R 0	R 0	R 0	R 0	R 0
Retrofitting and removal of wasteful		20%	20%	20%	20%	20%	100%
CAPEX	No	R 11 753 660	R 11 753 660	R 11 753 660	R 11 753 660	R 11 753 660	R 58 768 300
OPEX	No	R 0	R 0	R 0	R 0	R 0	R 0
Mains replacement :		20%	20%	20%	20%	20%	100%
CAPEX	km	R 1 030 000	R 1 030 000	R 1 030 000	R 1 030 000	R 1 030 000	R 5 150 000
OPEX	km	R 0	R 0	R 0	R 0	R 0	R 0
Pressure management :		20%	80%				100%
CAPEX	No	R 525 000	R 525 000	R 0	R 0	R 0	R 1 050 000
OPEX	No	R 85 000	R 85 000	R 85 000	R 85 000	R 85 000	R 425 000
Control valve management :		50%	50%				100%
CAPEX	No	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	No	R 0	R 0	R 0	R 0	R 0	R 0
Consumer metering :			25%	25%	25%	25%	100%
CAPEX	No	R 7 343 136	R 7 343 136	R 7 343 136	R 7 343 136	R 7 343 136	R 36 715 680
OPEX	No	R 18 357 840	R 18 357 840	R 18 357 840	R 18 357 840	R 18 357 840	R 91 789 200
Top consumer audit :		20%	20%	20%	20%	20%	100%
CAPEX	No	R 30 596 400	R 30 596 400	R 30 596 400	R 30 596 400	R 30 596 400	R 152 982 000
OPEX	No	R 7 649 000	R 7 649 000	R 7 649 000	R 7 649 000	R 7 649 000	R 38 245 000
GIS / CAD system :		50%	50%				100%
CAPEX	Sum	R 400 000	R 400 000	R 0	R 0	R 0	R 800 000
OPEX	Sum	R 800 000	R 800 000	R 800 000	R 800 000	R 800 000	R 4 000 000
Management Information System :		50%	50%				100%

CAPEX	Sum	R 400 000	R 400 000	R 0	R 0	R 0	R 800 000
OPEX	Sum	R 400 000	R 400 000	R 400 000	R 400 000	R 400 000	R 2 000 000
Water loss monitoring and audits:			50%	50%			100%
CAPEX	Sum	R 800 000	R 0	R 0	R 0	R 0	R 800 000
OPEX	Sum	R 80 000	R 80 000	R 80 000	R 80 000	R 80 000	R 400 000
	Type	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
TOTAL COSTS							
Institutional	CAPEX	R 800 000	R 0	R 800 000	R 0	R 0	R 1 600 000
	OPEX	R 625 000	R 625 000	R 625 000	R 625 000	R 625 000	R 3 125 000
	TOTAL	**R 1 425 000**	**R 625 000**	**R 1 425 000**	**R 625 000**	**R 625 000**	**R 4 725 000**
Financial	CAPEX	R 800 000	R 400 000	R 400 000	R 0	R 0	R 1 600 000
	OPEX	R 67 311 420	R 67 311 420	R 67 311 420	R 67 311 420	R 67 311 420	R 336 557 100
	TOTAL	**R 68 111 420**	**R 67 711 420**	**R 67 711 420**	**R 67 311 420**	**R 67 311 420**	**R 338 157 100**
Social	CAPEX	R 11 071 064	R 10 271 064	R 10 271 064	R 10 271 064	R 10 271 064	R 52 155 320
	OPEX	R 20 221 660	R 20 221 660	R 20 221 660	R 20 221 660	R 20 221 660	R 101 108 300
	TOTAL	**R 31 292 724**	**R 30 492 724**	**R 30 492 724**	**R 30 492 724**	**R 30 492 724**	**R 153 263 620**
Technical	CAPEX	R 61 453 196	R 60 653 196	R 59 003 196	R 59 003 196	R 58 963 196	R 299 075 980
	OPEX	R 32 326 840	R 32 326 840	R 32 326 840	R 32 326 840	R 32 326 840	R 161 634 200
	TOTAL	**R 93 780 036**	**R 92 980 036**	**R 91 330 036**	**R 91 330 036**	**R 91 290 036**	**R 460 710 180**
Total	CAPEX	R 74 124 260	R 71 324 260	R 70 474 260	R 69 274 260	R 69 234 260	R 354 431 300
	OPEX	R 120 484 920	R 120 484 920	R 120 484 920	R 120 484 920	R 120 484 920	R 602 424 600
	TOTAL	**R 194 609 180**	**R 191 809 180**	**R 190 959 180**	**R 189 759 180**	**R 189 719 180**	**R 956 855 900**
		R 194 609 180	R 191 809 180	R 190 959 180	R 189 759 180	R 189 719 180	
BENEFITS							
	Unit	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
CHANGE IN CONSUMPTION							
Reduced input volume		20%	40%	60%	80%	100%	300%
Volume	m^3/annum	1 133 296	2 266 592	3 399 889	4 533 185	5 666 481	16 999 444
Amount	R / annum	R 1 938 072	R 3 876 145	R 5 814 217	R 7 752 290	R 9 690 362	R 29 071 087
Increased revenue water		20%	40%	60%	80%	100%	300%
Volume	m^3/annum	2 106 475	4 212 949	6 319 424	8 425 899	10 532 373	31 597 120
Amount	R / annum	R 8 425 899	R 16 851 797	R 25 277 696	R 33 703 595	R 42 129 494	R 126 388 481
Total	**R / annum**	**R 10 363 971**	**R 20 727 942**	**R 31 091 914**	**R 41 455 885**	**R 51 819 856**	**R 155 459 568**

Payback period - years **6.2**

WC/WDM Projection summary and targets

Municipality name	Musina LM, Mutale LM, Thulamela LM, Makhado LM

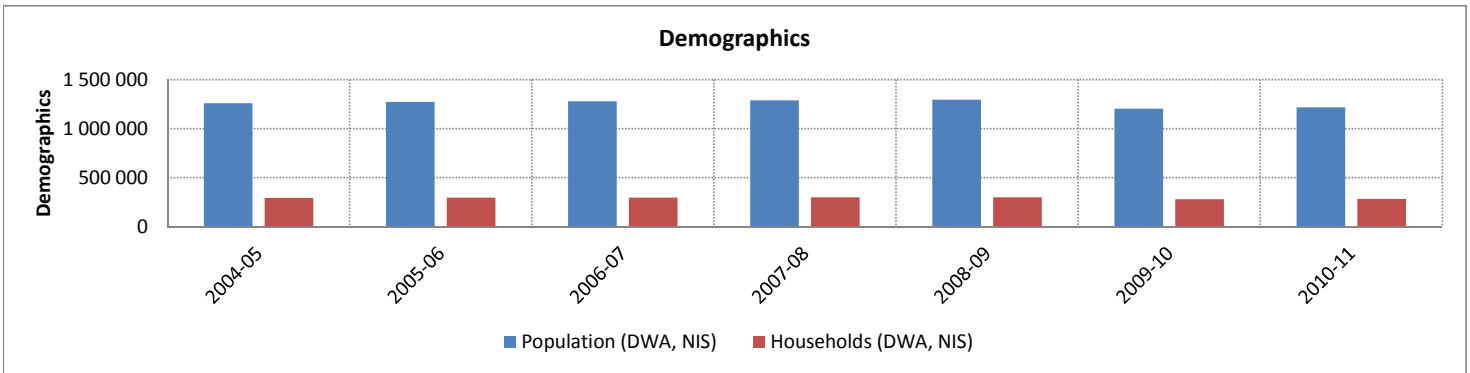
Water Demand projection	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Less 1.0% WDM Scenario							61.75	64.11	63.55	69.11	71.75	74.50
Less 3.0% WDM Scenario							61.54	63.68	61.88	68.18	70.55	72.99
Less 5.0% WDM Scenario							61.33	63.25	60.21	67.25	69.34	71.49
Actual Demand	59.00	58.73	58.60	60.46	62.32	61.39	61.85					
High population No WDM							61.85	64.32	66.90	69.57	72.36	75.25
Current yield	153.00	153.00	153.00	153.00	153.00	153.00	153.00	153.00	153.00	153.00	153.00	153.00

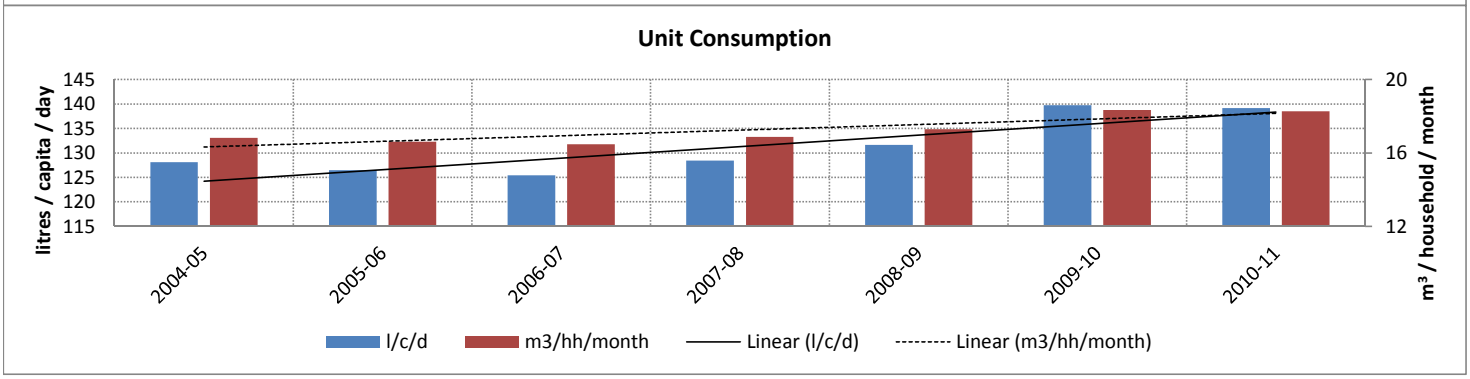
Savings	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Less 1.0% WDM Scenario							0.10	0.21	3.34	0.46	0.60	0.75
Less 3.0% WDM Scenario							0.31	0.64	5.02	1.39	1.81	2.26
Less 5.0% WDM Scenario							0.52	1.07	6.69	2.32	3.01	3.76
Actual savings							0.00					

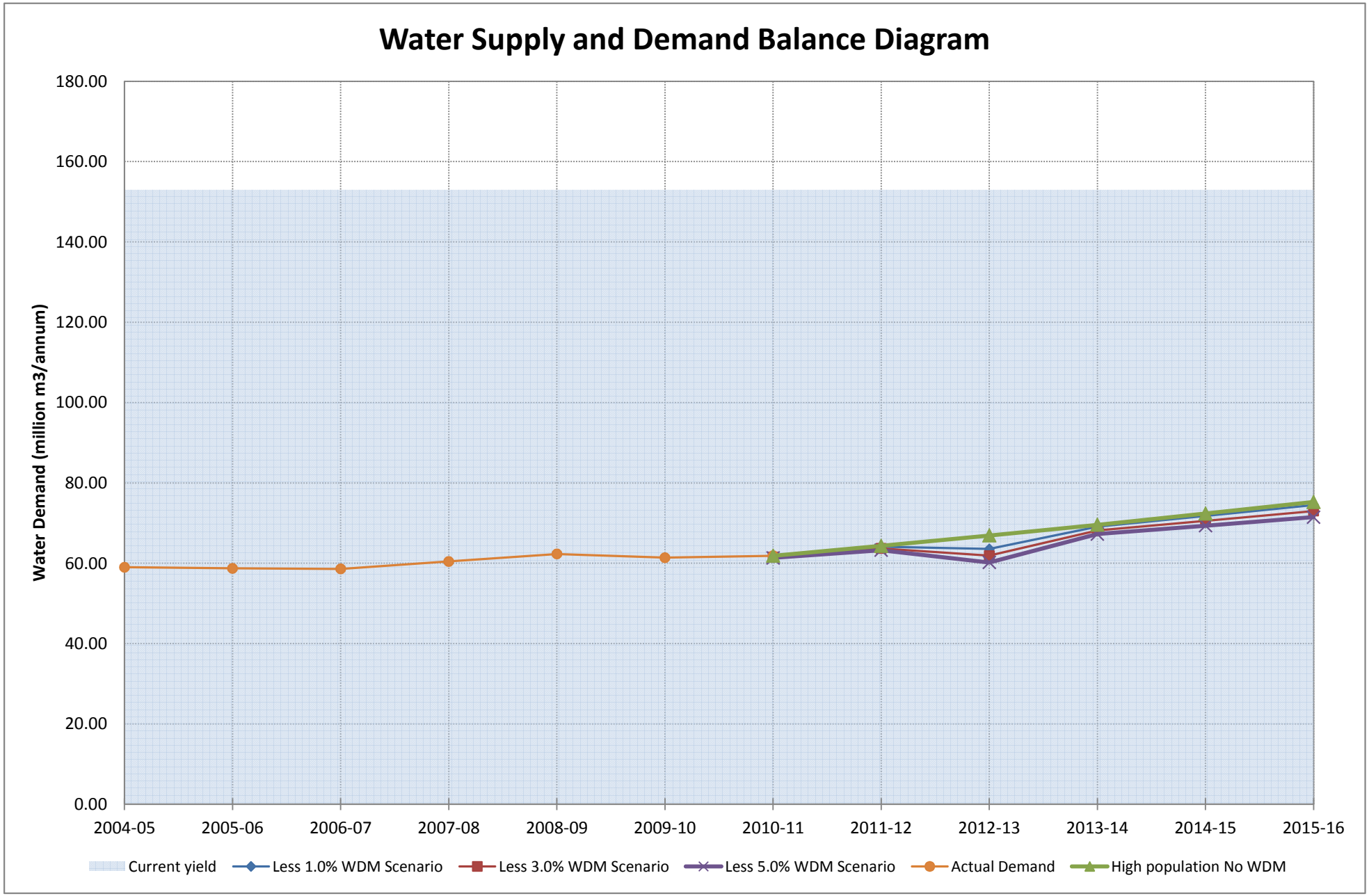
% Reduction	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Less 1.0% WDM Scenario							0.17%	0.33%	5.00%	0.67%	0.83%	1.00%
Less 3.0% WDM Scenario							0.50%	1.00%	7.50%	2.00%	2.50%	3.00%
Less 5.0% WDM Scenario							0.83%	1.67%	10.00%	3.33%	4.17%	5.00%

Year / Year % Growth	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Less 1.0% WDM Scenario								3.8%	-0.9%	8.7%	12.9%	7.8%
Less 3.0% WDM Scenario								3.5%	-2.8%	10.2%	14.0%	7.1%
Less 5.0% WDM Scenario								3.1%	-4.8%	11.7%	15.2%	6.3%
Actual Demand		-0.5%	-0.2%	3.2%	3.1%	-1.5%	0.8%					
High population No WDM								4.0%	4.0%	4.0%	4.0%	4.0%

Key Performance Indicators	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Population (DWA, NIS)	1 261 526	1 272 395	1 280 023	1 289 612	1 297 349	1 203 291	1 217 730					
Households (DWA, NIS)	292 169	294 701	296 457	298 679	300 463	278 936	282 283					
l/c/d	128	126	125	128	132	140	139					
m3/hh/month	17	17	16	17	17	18	18					
Demand Ml/day	162	161	161	166	171	168	169					






Water Supply and Demand Balance Diagram
Water Demand (million m3/annum)
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
2004-05
2005-06
2006-07
2007-08
2008-09
2009-10
2010-11
2011-12
2012-13
2013-14
2014-15
2015-16
Current yield
Less 1.0% WDM Scenario
Less 3.0% WDM Scenario
Less 5.0% WDM Scenario
Actual Demand
High population No WDM

WCWDM STRATEGY : RPMS Compliance

Municipality name	Musina LM, Mutale LM, Thulamela LM, Makhado LM

Key questions from the Regulatory Performance Measurement System (RPMS) related to WC/WDM

KPI		ID	WSA Value
KPI 1 – Access to Water			
KPI 2 – Access to Sanitation			
KPI 3 – Access to Free Basic Water			
	Total poor households receiving Free Basic Water for last financial year	ID:012	
	Total poor households	ID:013	
KPI 4 – Access to Free Basic Sanitation			
	Total poor households receiving Free Basic Sanitation for last financial year	ID:014	
	Total poor households	ID:013	
KPI 5 – Drinking Water Quality			
KPI 6 –Wastewater Quality			
KPI 7 - Customer Services Standards			
Component 1 – Service Interruptions			
	Total number of Service interruptions in the last financial year	ID:034	
	Number of interruptions in continuous service to consumers, where interruption for a single incident was greater than 24h	ID:033	
Component 2 – CRM Systems			
	Does the WSA have a customer Charter	ID:036	
	Does the WSA have a customer service centre	ID:035	
	Is there a system to manage customer queries and log faults	ID:038	
	Does the incident tracking system escalate complaints if not responded to within a prescribed time?	ID:037	
KPI 8 - Institutional Effectiveness			
Component 1 - Institutional Effectiveness			
	Completed WSDP is approved by Council for the last financial year?	ID:039	
	Required policies are in place and approved by Council?	ID:040	
	Required bylaws are in place and approved by Council?	ID:041	
	Contracts and Service level agreements in place with all appropriate service delivery role-players (WSPs, internal etc.)	ID:042	
	The WSA monitors the KPIs defined by the contract or SLA?	ID:043	
Component 2 - Water Services Staff Effectiveness			
	Total Water Services staff costs for the last financial year	ID:045	
	Total cost of water and sanitation provision for the last financial year including interest and depreciation (expenditure)	ID:046	
	Total budgeted for water services staff according to the approved organogram for the last financial year	ID:078	
Component 3 - Grant Funding Effectiveness			
	Total grant funding allocation received for the last financial year	ID:048	
	Total grant funding allocation spent for the last financial year	ID:047	
Component 4 - WSA Annual Report			
	WSA annual report submitted to Minister	ID:077	
Component 5 - % Filled Posts on Organogram			
	Total number of posts on Council-approved organogram for the last financial year for water services staff	ID:080	
	Total number of posts filled on the approved water services organogram in the last financial year	ID:079	

KPI 9 - Financial Performance			
Component 1 – Financial Integrity			
	Is WSA ring-fenced? (Separate legal entity=3, Separate accounting entity=2, Partially ring-fenced=1, Not ring-fenced at all=0)	ID:049	
	Audit report evaluation. (Unqualified=4, Qualified=3, Adverse=2, Disclaimer=1, No report=0)	ID:050	
Component 2 – Average Debtor Days			
	Water Services sales income for the last financial year (water/sanitation)	ID:052	
	Total outstanding customer/consumer debt for water and sanitation for the last financial year	ID:051	
Component 3 – Revenue Collection Effectiveness			
	Water Services sales income for the last financial year (water/sanitation)	ID:052	
	Water Services billed income actually received from consumers for last financial year	ID:053	
Component 4 – Average Creditor Days			
	Total bulk water purchases for the last financial year	ID:055	
	Total bulk water accounts outstanding for the last financial year	ID:054	
Component 5 – Financial Sustainability			
	Total water and sanitation income for the last financial year	ID:056	
	Total cost of water and sanitation provision for the last financial year including interest and depreciation (expenditure)	ID:046	
Component 6 – Financial Effectiveness			
	Total outstanding customer/consumer debt (after provisions) for water and sanitation for the last financial year	ID:051	
	Total provision for doubtful debt for water and sanitation for the last financial year	ID:082	
KPI 10 Strategic Asset Management			
Component 1 - Capital Spent on Rehabilitation and Replacement			
	Total capital budget (Water and Sanitation) in the last financial year	ID:063	
	Total capital spent on refurbishment and replacement in the last financial year	ID:062	
Component 2 –Asset Management Effectiveness			
	Asset management plan status	ID:057	
	Asset register status	ID:058	
	Asset management system is electronic	ID:059	
Component 3 – O&M Expenditure			
	Total spent on O&M/Annual maintenance cost (Water and Sanitation) in the last financial year	ID:060	
	Replacement value of assets (water services infrastructure)	ID:061	
Component 4 – Replacement Saving			
	Depreciation value for the last financial year (Water and Sanitation infrastructure)	ID:065	
	Contribution to asset replacement fund for the last financial year. (Water and Sanitation)	ID:064	
Component 5 – Asset Register Monitoring			
	Asset register field monitored: Date acquired	ID:066	
	Asset register field monitored: Estimated remaining life of asset	ID:068	
	Asset register field monitored: Replacement value of asset	ID:070	
	Asset register field monitored: Purchase cost of asset	ID:069	
	Asset register field monitored: Description of asset (Yes/No)	ID:067	
KPI 11 Water Demand Management			
	System input volume (external sources) for the last financial year	ID:121	
	System input volume (own sources) for the last financial year	ID:122	
	Total billed metered water consumption (volume) for the last financial year	ID:071	
	Total billed unmetered water consumption (volume) for the last financial year	ID:074	
	Total unbilled metered water consumption (volume) for the last financial year	ID: 073	
	Total unbilled unmetered water consumption (volume) for the last financial year	ID: 123	
ADDITIONAL QUESTIONS FOR WATER USE EFFICIENCY			

	Water Conservation and Water Demand Management plan		
	Installation of water efficient devices		
	Repair of leaks		
	Measurement or control of water supplied		
	Pressure management		
Additional KPI : Tariff Data			
	Which of the listed elements are taken into account when you determine your tariff? Indicate from the list provided	ID: 201	
	Total amount of subsidies allocated to water for the next financial year	ID: 202	
	Total projected cost of water provision for the next financial year	ID: 203	
	Does your tariff recognise the difference between levels of service (according to Regulation 4 under s10 of the Water Services Act)?	ID: 204	
	Does your tariff recognise the difference between socio-economic status of customers (according to s10 of the Water Services Act)?	ID: 205	
	Do you charge a rising block tariff?	ID: 206	
	How many blocks are in your tariff structure?	ID: 207	
	What is your approved standard tariff? (Basic levy)	ID: 208	
	What are the actual 2010/2011 tariffs for the following consumer categories?	ID: 209	
	Do you reflect your tariff structure on your bill?	ID: 210	
	What are the quantities of water supplied to the following consumer categories (annually)?	ID: 211	
	What is the unit number of consumers served with water in each consumer category?	ID: 212	
	Do you have a seasonal tariff in your WSA?	ID: 213	
	Does your tariff include a fixed charge?	ID: 214	
	If a fixed charge is levied, do you subsidise the FBW?	ID: 215	
	What other sources of water services revenue (other than tariffs) does your WSA have? Indicate sources on the list provided	ID: 216	
	Total annual water services surplus / deficit	ID: 217	

Appendix B : Polokwane LM Strategy and Business Plan

water affairs

Department:
Water Affairs
REPUBLIC OF SOUTH AFRICA

Department of Water Affairs : Rapid Response Unit

Water Demand Management Strategy and Business Plan

for Polokwane Local Municipality

March 2012

WCWDM STRATEGY AND BUSINESS PLAN: Signature Page

Title :	**Development of a First Order Water Conservation and Water Demand Management Strategy and Business Plan for Polokwane Local Municipality**			
Authors :	**WA Wegelin, Z Siqalaba, N Zondo**			
Study Name:	**Development of a First Order Water Conservation and Water Demand Management Strategy and Business Plan for Various Municipalities under the DWA Rapid Response Programme : Limpopo Province**			
Status of Report :	**Final draft**			
Consultants :	**WRP Consulting Engineers (Pty) Ltd**			
Approved for Consultants :	Study leader	WA Wegelin, PrEng		
	Position	**Name**	**Signature**	**Date**
Municipality	**Polokwane Local Municipality**			
Approved for municipality :	Municipal Manager			
	Position	**Name**	**Signature**	**Date**
Department of Water Affairs	**Limpopo Region**			
Approved for Regional Office :				
	Position	**Name**	**Signature**	**Date**
Department of Water Affairs	**Head Office**			
Approved for Head Office				
	Position	**Name**	**Signature**	**Date**

WCWDM STRATEGY AND BUSINESS PLAN: Contact details

Province	Limpopo	WSA	Yes
Municipal Code	LIM354	Category	B1
District Municipality	Capricorn		
Municipality	Polokwane		
Settlements	Boyne, Bylsteel, Leshwane, Makgwareng, Nuwe Smitsdorp, Polokwane, Rietkolk, Sebayeng, Seshego		

Information provided by			
Date	17/11/2011		
Contact person	Mushaisano Ramusetheli		
Position	Water Services Manager		
Telephone	015 290 2194		
E-mail	mushair@polokwane.gov.za		
Study team contact			
Company	WRP Consulting Engineers		
Address	PO Box 1522, Brooklyn Square, 0075		
Contact person	Mr Willem Wegelin		
Telephone number	012 346 3496	**Cell number**	083 4477 999
E-mail	willemw@wrp.co.za		

Water Affairs contact			
Directorate	Limpopo Regional Office		
Address	Private Bag X9506, Polokwane, 0700		
Contact person	Ms Motlatso Machaba		
Telephone number	(015) 290 1272	**Cell number**	082 885 6125
E-mail	machabamo@dwa.gov.za		

Water Balance Data Confidence Level (see legend below)	
Input volume	Medium level of accuracy
Authorised consumption (Engineering functions)	Medium level of accuracy
Meter reading and billing (Finance functions)	Medium level of accuracy
Legend	
High level of accuracy	Calibrated bulk meters, >98% of consumers are metered < 10 years old, <2% billing complaints
Medium level of accuracy	Functional bulk meters, >90% of consumers are metered, <10% billing complaints
Low level of accuracy	Some functional bulk meters, >50% consumer meters, any age, meter reading & billing dysfunctional
Estimated values	No bulk or consumer meter readings, best estimate of water consumption
No data	No data and no idea of water consumption

WCWDM STRATEGY AND BUSINESS PLAN: Executive Summary

Province	Limpopo	WSA	Yes
Municipal Code	LIM354	Category	B1
District Municipality	Capricorn		
Municipality	Polokwane		
Settlements	Boyne, Bylsteel, Leshwane, Makgwareng, Nuwe Smitsdorp, Polokwane, Rietkolk, Sebayeng, Seshe		

Executive summary

Status quo

The municipality started with WCWDM and there is sufficient management information available to perform an assessment of the water losses and potential savings. The performance is in line with RPMS and DWA Drop assessments.
All towns are formal with formal infrastructure which enables proper metering and billing but rural areas are a problem.
The engineering department is characterised by high (40%) vacancy and lacks management capacity and skills.
The working relationship with the finance department can improve.
The NRW is very high at 44.5% but the unit consumption of 150 l/c/d is low and probably as a result of the rural water supply schemes. A better understanding of the population supplied and LOS is required.
There has been a considerable increase in unit consumption over the past few years.
The relationship with the community is fair but can improve with the elimination of intermittent supply.

Strategy

The municipality should focus on proper recording keeping, analysis and development of detailed management information.
The engineering and finance department must work closer together to improve metering, billing and cost recovery and start with a meter audit. All vacancies must be filled as a matter of priority together with skills transfer and capacity building.
A steering committee should be setup to report on a monthly basis to council on water loss figures, leaks repaired, targets, progress, consumer metering, billing and cost recovery.
Proper metering, billing and cost recovery should be supported by community awareness that promotes reporting of leaks, fixing of private leaks and efficient use.
Based on the available information, a target reduction in NRW of 45% down to 26% and target input volume reduction of 3.5% have been set.
Review the water tariff structure to promote WCWDM, reflects true cost and work towards compliance with RPMS and improvement of their WSDP.

Business Plan

The budget requirements for the next five years are summarised in the table below:

Intervention	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Institutional	700 000	900 000	600 000	600 000	600 000	3 400 000
Financial	9 100 000	9 300 000	9 000 000	9 000 000	9 000 000	45 400 000
Social	2 190 000	2 190 000	1 690 000	1 690 000	1 690 000	9 450 000
Technical	15 813 800	18 688 800	11 491 800	11 266 800	11 266 800	68 528 000
Total	**27 803 800**	**31 078 800**	**22 781 800**	**22 556 800**	**22 556 800**	**126 778 000**

Compliance

Results from the Regulatory Performance Measurement System (RPMS)

Key Performance Indicators	Achieved KPI Score	Required score	Performance assessment
KPI 1: Access to water supply [Overall KPI compliance score]	3.711	3	Excellent
KPI 2: Access to sanitation [Overall KPI compliance score]	3.161	3	Adequate
KPI 3: Access to Free Basic Water [Overall KPI compliance score]	5	3	Excellent
KPI 4: Access to Free Basic Sanitation [Overall KPI compliance score]	0	3	Crisis
KPI 5: Drinking Water Quality management [Overall KPI compliance score]	3	3	Adequate
KPI 6: Wastewater quality management [Overall KPI compliance score]	3	3	Adequate
KPI 7: Customer service quality [Overall KPI compliance score]	3.25	3	Adequate
KPI 8: Institutional effectiveness [Overall KPI compliance score]	3.614	3.5	Adequate
KPI 9: Financial performance [Overall KPI compliance score]	4.177	4	Adequate
KPI 10: Strategic asset management [Overall KPI compliance score]	4.792	3	Excellent
KPI 11: Water use efficiency [Overall KPI compliance score]	0	3	Crisis

Results from Blue and Green Drop Assessments

Assessment	2009	2010	2011	2012
Blue drop	64.90%	81.00%	92.61%	
Green drop	38.00%	-	67.20%	

WCWDM STRATEGY AND BUSINESS PLAN: Municipal Water Conservation and Water Demand Management Implementation Process Map

Strategy and Planning Phase Performed by WCWDM Strategy Steering Committee (MEC, Municipal Manager, Technical and Financial Directors) Reviewed by SSC and DWA					Implementation Performed by Department Reviewed by SSC and DWA	Monitoring and Review Performed by Department Reviewed by SSC and DWA
Vision	**Mission**	**Situation**	**Strategy**	**Business Plan**	**Implementation**	**Deliverables**
Water Services Act, 108 of 1997 **Provide water services in an efficient, affordable, equitable, economical and sustainable manner to all consumers or potential consumers in its area of jurisdiction.** BIG HAIRY AND AUDACIOUS VISION If it doesn't scare you, its not big enough 	Presidential Target (State of the Nation address 2010) Reduce water losses by half by 2014	***Technical*** Information on demographics, demands, water loss, level of service Key water loss contributing factors Key performance indicators and targets Asset value and condition Departmental organogram	***Technical*** **SWOT Analysis : Strengths**, **W**eaknesses, **Opportunities** & **T**hreats of technical department (human resources, processes, **Goals and objectives:** Achieving water loss reduction target in terms of available resources and non-revenue water. If no target exists, then goal is to develop a target. **How :** Identify key principles to achieve target (user pay, water restrictions, consumer education, etc.) **Actions :** Responsible person, measurement and timelines to address SWOT analysis	***Technical*** Bulk metering Leakage control and repair Sectorisation and zone metering Logging and water loss monitoring Non domestic and domestic metering and audits Resolve intermittent supply Pressure management Clean out and recommission existing infrastructure Training and capacity building	***All Projects*** Council approval of Strategy and Business Plan Identify key stakeholders - setup working committees Appoint PSP Appoint contractor Assess / determine baseline Implement interventions Project Quality Control Project Financial Management Establish record keeping and reporting processes Assess benefits from implementation Establish take-over procedure Training and capacity building	***Technical*** Record keeping and reporting process Monthly IWA Water Balance calculation for system and DMA No visible leakage Asset management Comply with Regulations R509 of 2001 Responsible WCWDM individual/unit Measurement against goals
		Economic Tariffs Metering, billing and revenue collection status Existing sources of funding	***Economic*** **SWOT Analysis : Strengths**, **W**eaknesses, **Opportunities** and **T**hreats of funding sources **Goals and objectives:** Allocate sufficient funding to address WCWDM **How :** Identify key principles to obtain funding (improved metering and billing, cost recovery, external funding, etc.) **Actions :** Responsible person, measurement and timelines to address SWOT analysis	***Economic*** Review tariff structure Ensure effective metering and billing system Review CAPEX budget in terms of WDM goals Review OPEX budget in terms of WDM goals Develop business plan for external funding Training and capacity building		***Economic*** Sufficient budget allocation Realistic tariff setting Efficient meter reading, billing and cost recovery process Measurement against goals
		Social Customer profile Communication dynamics between WSA and consumers Existing support structures for consumers Level of stakeholder involvement	***Social*** **SWOT Analysis : Strengths**, **W**eaknesses, **Opportunities** and **T**hreats of consumers and institution **Goals and objectives:** Informed and supportive consumer and institution **How :** Identify key principles to develop turn consumers into customers (political, schools, specific consumer groups, water wise, etc.) **Actions :** Responsible person, measurements and timelines to address SWOT analysis	***Social*** Raise awareness at political levels Raise awareness at institutional levels Identify and engage relevant stakeholders Establish customer care centre Training and capacity building Conduct WC/WDM education and awareness Conduct schools awareness campaigns		***Social*** Political support Institutional support Informed, involved and supportive consumer Measurement against goals
		Institutional Existence of approved policies Existence of approved bylaws Regulatory compliance Legislative compliance	***Institutional*** **SWOT Analysis : Strengths**, **W**eaknesses, **Opportunities** and **T**hreats of policies, bylaws, political support , enforcement, Regulatory compliance **Goals and objectives:** Reform organisation to support WCWDM **How :** Identify key principles to obtain improve (improved political support, policies, enforcement, etc.) **Actions :** Responsible person, measurement and	***Institutional*** Establish policies in terms of payment for services, arrears, Establish bylaws that addresses water loss reduction and efficiency Succession planning - ensure initiatives continue		***Institutional*** Approved policies Approved bylaws Policy and bylaws enforcement Regulatory compliance Succession plan Measurement against goals

Deliverables

Review and update strategy and business plan . Implement and regulate.

Detailed management information

DWA Planning and target setting, Review strategies and Business Plans and align with targets, Possible funding, Technical and Institutional Support, Develop generic Policies and bylaws, Develop Regulations and Regulate, Report to Presidency

WCWDM STRATEGY : Definitions

Terminology

Acronym	Description	Link
DWA	Department of Water Affairs	http://www.dwa.gov.za
WS RPMS	Water Services : Regulatory Performance Measurement System	http://www.dwa.gov.za/dir_ws/rpm/
WS NIS	Water Services : National Information System	http://www.dwa.gov.za/dir_ws/wsnis/
FBS	Water Services : Free Basic Water Project	http://www.dwaf.gov.za/dir_ws/fbw/
NRW	Non-revenue water. Volume of water for which no revenue is received (preferred term)	
UAW or UFW	Unaccounted-for water. Volume of water lost due to physical and apparent losses (not preferred term)	
StatsSA NFC	Statistics South Africa : Non-Financial Census of Municipalities P9115	http://www.statssa.gov.za/

Information sources

Item	Source	Calculation
Population	DWA WS NIS or municipality	
Households	DWA WS NIS or municipality	
Connections - metered	Extrapolated 2007 DWA - WS FBW serviced above RDP or municipality	
Connections - Unmetered	Extrapolated 2007 DWA - WS FBW serviced at RDP or municipality	
Length of mains (km)	Actual value or calculated at average of 50 connections / km of mains	# connections ÷ 50
(A) System input volume	Total volume of potable water supplied by the municipality in kl/annum	
(B) Billed metered consumption	Total volume of water metered and billed by the municipality in kl/annum	
(C) Billed unmetered consumption	Total volume of water unmetered and billed by the municipality in kl/annum	
Underlined values	Calculated values using trends or averages	

Standard IWA Water Balance

SYSTEM INPUT VOLUME:
1 + 2 + 3
1. Total water treated and measured at treatment works outlet
2. Total water pumped directly from boreholes into reticulation system
3. Total water purchased from bulk water services provider

AUTHORISED CONSUMPTION:
1 + 2 + 3 + 4
Total water used for legitimate purposes
1. Billed metered water
2. Billed un-metered water
3. Unbilled metered water
4. Unbilled un-metered water

BILLED METERED:
1. Water is billed for based on a metered consumption (see further explanatory notes).

BILLED UN-METERED:
1 + 2
1. Water is billed for based on a flat rate tariff (ie. Not based on a meter reading)
2. Free basic water used through unbilled un-metered stand pipes or yard connections (see further explanatory notes)

REVENUE WATER:
1 + 2
1. Billed metered
2. Billed un-metered

UNBILLED METERED:
1. Usually very small in RSA, can include government buildings or parks that is metered but not billed.

UNBILLED UN-METERED:
1. Estimated water used for legitimate purposes such as fire fighting. Also usage above free basic water for un-metered unbilled standpipe and yard connection usage. (see notes)

Unaccounted for Water (UAW / UFW)

TOTAL LOSSES:
1 + 2
Total water not used for legitimate purposes
1. Apparent losses
2. Real losses

APPARENT LOSSES:
1 + 2 + 3
1. Water used through illegal connections
2. Water used but not billed for because of inaccurate meters
3. Water used but not billed for because of data transfer errors, low estimated readings or any administrative errors.

REAL LOSSES:
1. Water that leaks from the system through pipes and connections or overflows from reservoirs

NON REVENUE WATER:
1 + 2 + 3 + 4
1. Unbilled metered
2. Unbilled un-metered
3. Apparent losses
4. Real losses

Apparent Losses

Illegal connections	%	Water Quality	Meter age and accuracy	%	Data transfer	%
Very high	10%	Very poor	> 10 years	10%	Very poor	9%
High	8%	Poor		8%	Poor	7%
Average	6%	Average	5- 10 years	6%	Average	5%
Low	4%	Good		4%	Good	3%
Very low	2%	Very good	< 5 years	2%	Very good	1%

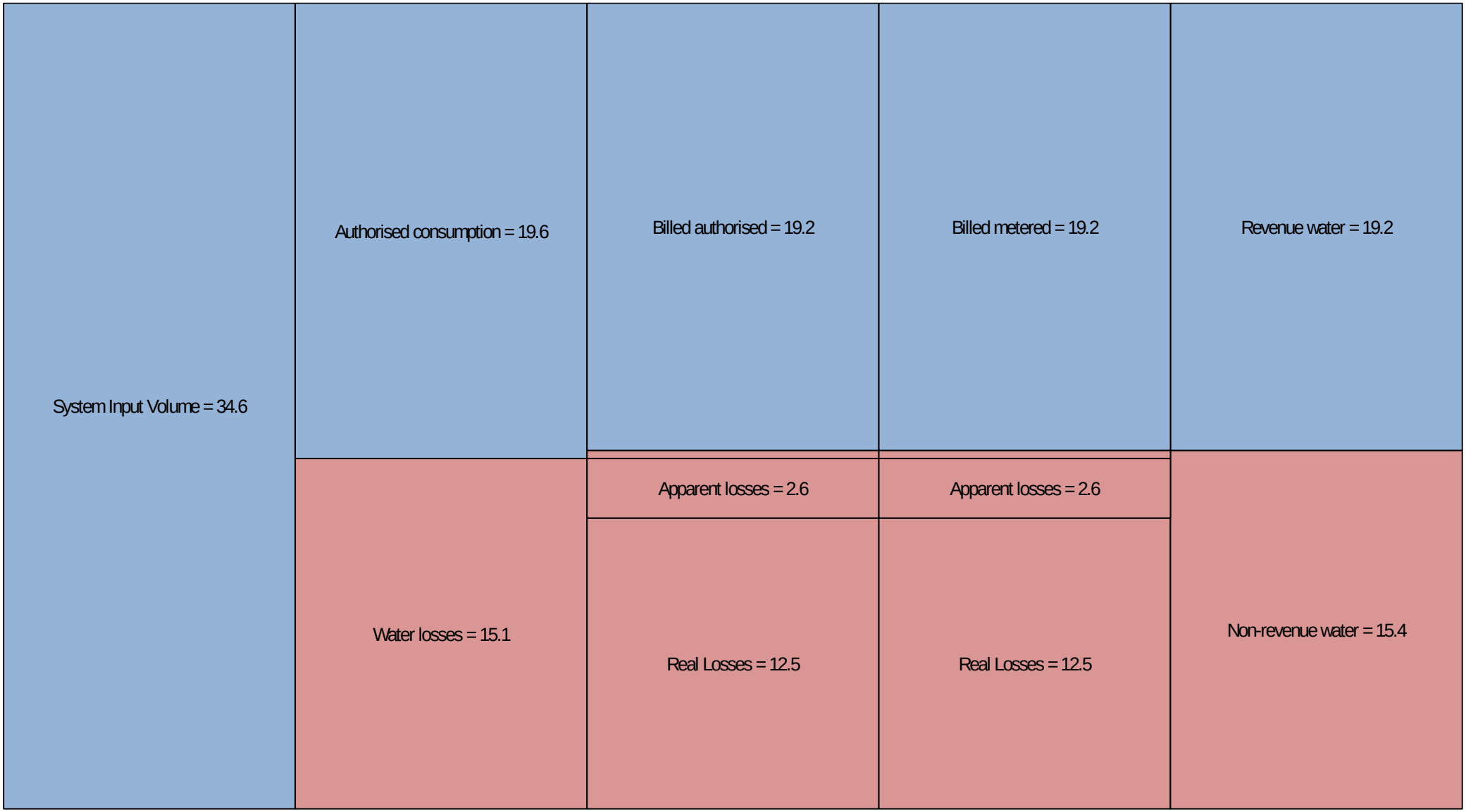
WCWDM STRATEGY : Base Information

Municipality name	Polokwane			Date of current data	2010
			Current	Target	Change
Input Data	Demographics	WSDP Ref			
	Population	Par 2.4	No	631 318	631 318	0
	Urban		No	229 347	229 347	
	Rural		No	401 971	401 971	
	Households	Par 2.4	No	153 980	153 980	0
	Urban		No	55 938	55 938	
	Rural		No	98 042	98 042	
	Household density		Pop / HH	4.1	4.1	
	Growth rate: 5 years	Par 4.1.3	%	4.0%	4.0%	0
	Consumer units	Par 3.3	No	90 882	90 882	0
	Residential		No	87 959	87 959	
	Police stations		No	3	3	
	Magistrates Offices		No	3	3	
	Business		No	945	945	
	Dry industries		No	1 478	1 478	
	Office buildings		No	144	144	
	Prisons		No	1	1	
	Schools		No	310	310	
	Health facilities		No	33	33	
	Wet industries		No	6	6	
	Mining		No	1	1	
	Resorts and tourism		No	2	2	
	Infrastructure					
	Water Level of Service	Par 3.1	no	90 830	90 830	0
	Stand pipes		HH	0	0	0
	Yard connections		HH	0	0	
	House connections		HH	90 830	90 830	
	Length of mains (km)	Par 5.1.2	km	1 443.0	1 443.0	0
	Connections / km of mains		No / km	62.9	62.9	
	Average system pressure		m	40	40	0
	Time pressurised		%	100%	100%	0
	Sanitation Level of Service	Par 3.2		60 142	60 142	0
	None water borne		No	26 942	26 942	
	Water borne low flush		No			
	Septic tanks / conservancy		No	771	771	
	Water borne - WTW		No	32 429	32 429	
	Apparent losses		%	17%	17%	0%
	Consumer meter age		%	6%	6%	0%
	Illegal connections		%	6%	6%	0%
	Data transfer		%	5%	5%	0%
	Water balance data					
	System input volume		kℓ/annum	34 636 897	31 078 147	-3 558 750
	Own sources		kℓ/annum	20 401 897	20 401 897	0
	Other sources		kℓ/annum	14 235 000	10 676 250	-3 558 750
	Billed metered consumption		kℓ/annum	19 225 693	23 070 832	3 845 139
	Billed unmetered consumption		kℓ/annum			0
	Unbilled metered consumption		kℓ/annum			0
	Unbilled unmetered consumption		kℓ/annum	346 369	310 781	-35 588

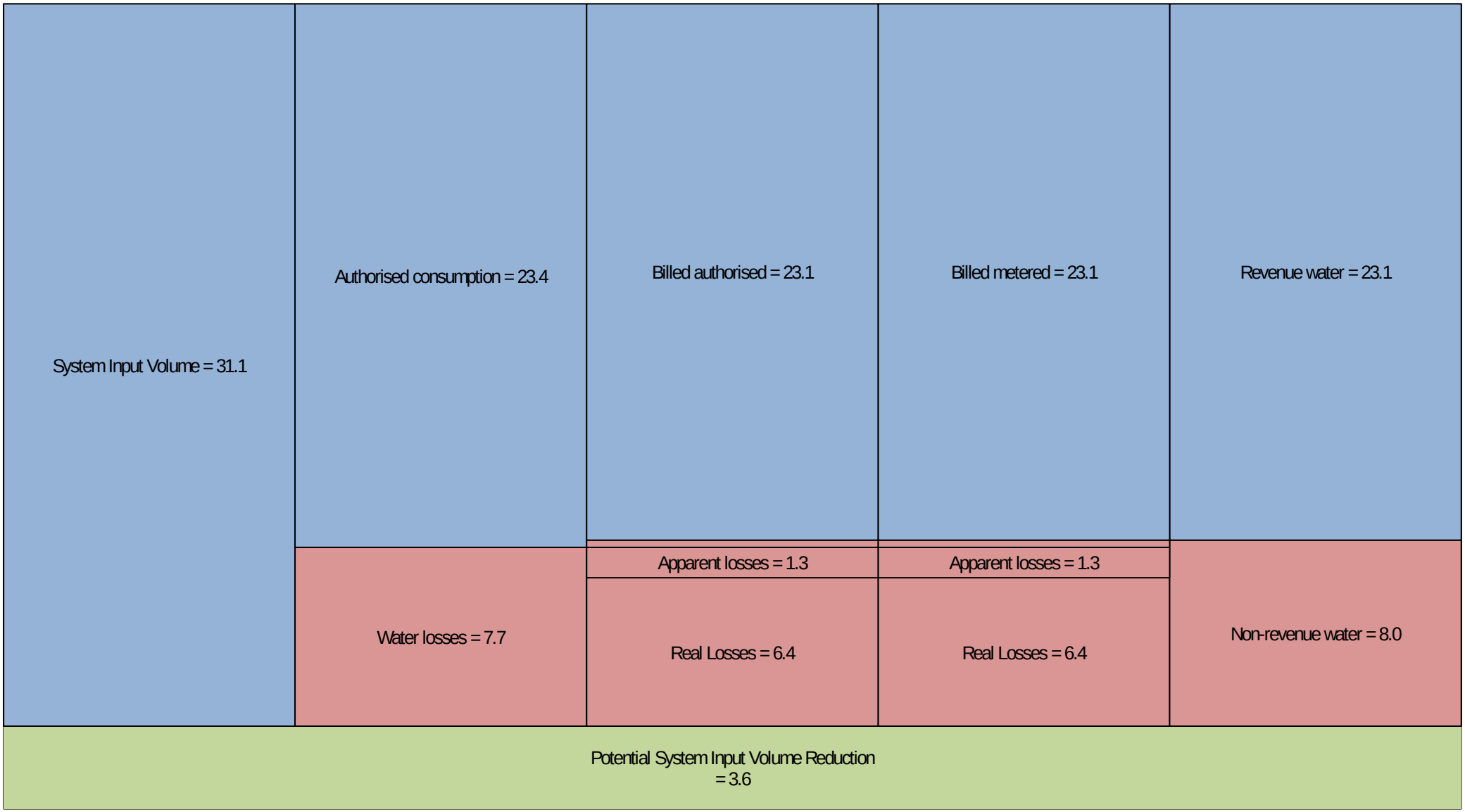
	Water Tariffs					
	Purchase of bulk water	Par 10.2	R/annum	R 73 200 000	R 73 200 000.00	R 0.00
	Total operating cost		R/annum	R 246 900 000	R 246 900 000.00	R 0.00
	Rate - Purchase of bulk water		R/kℓ	R 5.14	R 6.86	
	Rate - Total operating		R/kℓ	R 7.13	R 7.94	
	Domestic Water Tariffs	Par 10.3				
	0 to	5	kℓ/month	R 4.10	R 4.10	R 0.00
	5 to	15	kℓ/month	R 6.20	R 6.20	R 0.00
	15 to	30	kℓ/month	R 6.70	R 6.70	R 0.00
	30 to	50	kℓ/month	R 8.85	R 8.85	R 0.00
	50 to	100	kℓ/month	R 10.70	R 10.70	R 0.00
	>	100	kℓ/month	R 12.95	R 12.95	R 0.00
Water Balance Calculations	System input volume		kℓ/annum	34 636 897	31 078 147	-3 558 750
	Authorised Consumption		kℓ/annum	19 572 062	23 381 613	3 809 551
	Billed authorised		kℓ/annum	19 225 693	23 070 832	3 845 139
	Billed metered		kℓ/annum	19 225 693	23 070 832	3 845 139
	Billed unmetered		kℓ/annum	0	0	0
	Unbilled authorised		kℓ/annum	346 369	310 781	-35 588
	Unbilled metered		kℓ/annum	0	0	0
	Unbilled unmetered		kℓ/annum	346 369	310 781	-35 588
	Water losses		kℓ/annum	15 064 835	7 696 534	-7 368 301
	Apparent losses		kℓ/annum	2 561 022	1 308 411	0
	Real losses		kℓ/annum	12 503 813	6 388 123	-7 368 301
	UARL		kℓ/annum	1 440 115	1 440 115	0
	Potential real loss saving		kℓ/annum	11 063 698	4 948 008	-7 368 301
	Revenue water		kℓ/annum	19 225 693	23 070 832	3 845 139
	Non-Revenue water		kℓ/annum	15 411 204	8 007 315	-7 403 889
Key Performance Indicators	System input volume unit consumption					
	litres / capita / day		ℓ / c / d	150	135	-15
	m³ / household / month		m³ / hh / month	19	17	-2
	m³ / connection / month		m³ / conn / month	32	28	-4
	Authorised unit consumption					
	litres / capita / day		ℓ / c / d	85	101	16
	m³ / household / month		m³ / hh / month	11	13	2
	m³ / connection / month		m³ / conn / month	18	21	3
	Water loss indicators					
	UARL : Losses / connection / day		ℓ / conn / day	43	43	0
	CARL : Losses / connection / day		ℓ / conn / day	377	193	-184
	Infrastructure Leakage Index (ILI)		-	8.68	4.44	-4
	Losses / km mains / day		m³ / km / day	23.7	12.1	-12
	Non-revenue water		%	44.5%	25.8%	-18.7%
	Unbilled Consumption		%	1.0%	1.0%	0.0%
	Water Losses		%	43.5%	24.8%	-18.7%
	Apparent losses		%	7.4%	4.2%	-3.2%
	Real losses		%	36.1%	20.6%	-15.5%
Cost Analysis	Average monthly water bill / connection		R / conn / month	R 103	R 123	R 20
	Estimated annual income		R / annum	R 111 829 896	R 133 738 092	R 21 908 196
	Total water supply cost		R / annum	R 246 900 000	R 246 900 000	R 0
	Net profit / loss		R / annum	-R 135 070 104	-R 113 161 908	R 21 908 196

	Town and description	Source	Ml/day	m^3/annum	million m^3/annum
Water Source and Treatment Capacity				0	0.000
				0	0.000
				0	0.000
					0.000
	Total		0.00	0	0.000

Current IWA Water Balance Diagram (million m^3/annum)



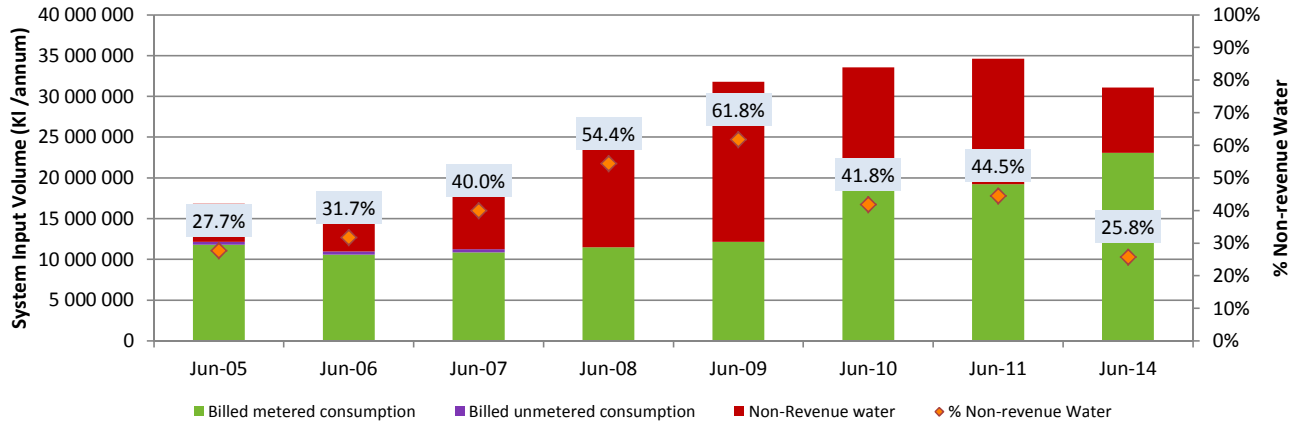
Target IWA Water Balance Diagram (million m^3/annum)



WCWDM STRATEGY : Water Balance History

Municipality Name	Polokwane

			Year ending	Jun-05	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	Jun-11	Jun-14
Input Data			Population	544 548	545 816	549 087	553 203	556 524	518 674	561 772	596 157
			Households	140 564	140 899	141 733	142 807	143 655	133 889	130 361	138 340
			Connections - metered						74 012	75 751	80 388
			Connections - Unmetered						56 349	54 610	57 953
			Length of mains (km)						1 363	1 443	1 531
	System input volume	kl/annum		16 842 248	16 064 072	18 728 695	25 251 093	31 773 490	33 555 165	34 636 897	31 078 147
	Billed metered consumption	kl/annum		11 816 000	10 604 708	10 875 001	11 508 689	12 142 377	19 523 972	19 225 693	23 070 832
	Billed unmetered consumption	kl/annum		360 000	360 000	360 000		0	0	0	0
	Unbilled metered consumption	kl/annum								0	0
	Unbilled unmetered consumption	kl/annum		168 422	160 641	187 287	252 511	317 735	335 552	346 369	310 781
Water Balance Calculations	Revenue water	kl/annum		12 176 000	10 964 708	11 235 001	11 508 689	12 142 377	19 523 972	19 225 693	23 070 832
	Non-Revenue water	kl/annum		4 666 248	5 099 364	7 493 694	13 742 404	19 631 113	14 031 193	15 411 204	8 007 315
	Water Losses	kl/annum		4 497 826	4 938 723	7 306 407	13 489 893	19 313 378	13 695 641	15 064 835	7 696 534
	% Non-revenue water			27.7%	31.7%	40.0%	54.4%	61.8%	41.8%	44.5%	25.8%
	% Water Losses			26.7%	30.7%	39.0%	53.4%	60.8%	40.8%	43.5%	24.8%
Key performance indicators	Input : Litres / capita / day			85	81	93	125	156	177	169	143
	Input: m³ / household / month			10	10	11	15	18	21	22	19
	Billed : Litres / capita / day			61	55	56	57	60	103	94	106
	Billed : m³ / household / month			7	6	7	7	7	12	12	14
	% Population growth				0.23%	0.60%	0.75%	0.60%	-6.80%	8.31%	2.00%
	% Water demand growth				-4.62%	16.59%	34.83%	25.83%	5.61%	3.22%	-3.55%
Source of information				DWA NIS StatsSA NFC	DWA NIS StatsSA NFC	DWA NIS StatsSA NFC	DWA NIS Estimated	DWA NIS StatsSA NFC	DWA NIS Municipality	DWA NIS WSDP	Estimated



Comments

WCWDM STRATEGY : Qualitative Scorecard

Municipality Name	Polokwane

Introduction

The purpose of this section is to perform a qualitative evaluation of the municipality's water business. The objectives are as follows :

SWOT Analysis	External - Opportunities Positive external conditions which you don't control which you could take advantage of	External - Threats Negative conditions you don't control but could minimise their effects
Internal - Strengths Positive aspects under your control and on which you may wish to capitalise	Strengths and Opportunities (SO) – Strategies that use strengths to maximize opportunities.	Strengths and Threats (ST) – Strategies that use strengths to minimize threats.
Internal - Weaknesses Negative aspects under your control (to a large extent) which you could plan to improve	Weaknesses and Opportunities (WO) – Strategies that minimize weaknesses by taking advantage of opportunities.	Weaknesses and Threats (WT) – Strategies that minimize weaknesses and avoid threats.

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY (1) High (3) Low
1	**INSTITUTIONAL REVIEW**				
1.1	**Water and Sanitation department structure**				
1.1.1	Is there an approved organogram for the Water and Sanitation Department?	The existing organogram is under review and critical vacancies have been identified	**S**	Ensure that the revised organogram is approved as soon as possible	**1**
1.1.2	What is the vacancy rate in the department and is it a problem?	Current vacancy rate is 40%. This is problematic as critical positions in the section are open and the operations and maintenance team must be significantly expanded to cope with the management of the water supply system	**W**	Identified critical posts must be filled within the next 6 months.	**1**
1.1.3	Does the department have the correct technical skills for the correct posts.				
1.1.4	Is training and capacity building being done?	No training and capacity building is currently taking place.	**W**	A training programme should be instituted particularly for O&M staff and WDM Management personnel to improve efficiency and monitoring	**2**
1.1.5	Are there sufficient support structures ito vehicles, equipment, materials etc.?	Supply chain appears to have challenges in terms of expediting the procurement of material.	**T**	The Supply Chain management systems must be improved. Alternatively the municipality can outsource the procurement of material improve the efficiency of obtaining materials	**1**
1.1.6	Does the municipality own any water loss control equipment such as loggers, listening sticks, etc.?	There is no existing water loss control equipment. The municipality primarily undertakes reactive maintenance.	**W**	It is recommended that loggers and simple leak detection equipment be purchased to improve water loss monitoring and management in the system.	**2**
1.2	**Municipal support**				

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY (1) High (3) Low
1.2.1	Describe the working relationship with other departments such finance, planning, housing etc.?	The relationship between the Finance and Technical department is very good.	O	The positive relationship between these departments should be utilised to improve water loss management. Water sales can be requested on a monthly basis from finance in order to compile and more effectively monitor the NRW.	
1.2.2	Are the politicians supporting the department?	The politicians are supportive particularly in the improvement of cost recovery, however they require WC/WDM training to better understand the objectives and goals of the municipality.	O	Plan a workshop session with the local councillors comprising an introduction to WC/WDM.	3
1.3	**Public Private Partnerships**				
1.3.1	Is there any major industrial or institutional role player in the area and is there co-operation?				
1.3.2	If yes, what does the co-operation involve and can it be expanded?				3
1.4	**Legislation and bylaws**				
1.4.1	Does the municipality have a customer service charter?	The municipality has no existing customer charter but intend to develop one.	O	Develop a customer service charter to ensure the customers are aware of the municipalities commitment and their responsibilities as consumers.	2
1.4.2	What is the status and age of the existing bylaws and do they address water loss management?	There are existing promulgated bylaws which address WC/WDM.	S	Periodically review the bylaws and ensure they encapsulate the latest developments and continue to promote WC/WDM.	2
1.4.3	Are bylaws enforced and if not, why not?	There bylaws are not enforced.	O	Bylaw enforcement mechanisms should be put in place in partnership with local institutions such as the SAPS as well as the Legal department of the municipality.	1
1.4.4	What is the status and age of Water Services Development Plan?	An annually reviewed Water Services Development Plan was developed and submitted for 2010.	S	Continuously update the WSDP on an annual basis.	1
2	**FINANCIAL REVIEW**				
2.1	**Financial Department**				
2.1.1	What is your opinion of the Finance Department's ability to perform metering and billing				
2.1.2	Is training and capacity building being done?				
2.1.3	What is the state of the municipal metering and billing system?	Inaccurate meter readings have become a significant concern. A contract with a new meter reading company is currently being negotiated to improve efficiency.	S	Finalise new meter reading contract and monitor the metering situation.	1
2.1.4	What is your primary source of funding?				
2.2	**Tariffs**				

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY (1) High (3) Low
2.2.1	Who prepares the water tariffs and what is it based on?	The water tariffs are prepared by the department of Finance, however the technical department does make inputs. No guidelines were previously used to set the tariffs but guidelines will be used by the municipality in future	T	Obtain National Treasury tariff guidelines and review tariffs.	1
2.2.2	What is the tariff structure and does it promote WCWDM?	Currently, the tariffs do not adequately cover the costs of service provision. The municipality is operating at a huge financial deficit	T	Review the current tariff structure. Institute a rising block tariff sufficiently differentiated in cost at each level to promote WCWDM	1
2.2.3	Is the water supplied considered affordable by the customers?	The tariff appears affordable for the consumers which is indicated by the high levels of payment and cost recovery	S	Continue ensuring that the tariffs remain affordable particularly for the efficient and low income water users	1
2.3	**Meter Reading and Billing**				
2.3.1	Who performs the water meter readings, frequency and accuracy?	An external meter reading company has been contracted to undertake meter reading, however the work produced has been sub standard	T	Monitor the frequency and accuracy of meter reading through the customer complaints system.	1
2.3.2	Are the meter readers trained and can they report leakage when encountered on site?				
2.3.3	Is the water bill understandable and informative?	Informative billing is taking place.	S	Consider including water conservation tips and information in the water bill. It is also recommended to display 6 months graphical consumption data on the bill to aid consumers in effectively monitoring water use	3
2.4	**Credit control**				
2.4.1	Is credit control being implemented and by whom?				
2.4.2	What is the current level of non-payment?	Non payment levels are low particularly because the politicians are active in supporting cost recovery.	S	Capitalise on the relationship with the councillors and the community and ensure that the areas that re not yet metered are metered and billed to increase revenue water	3
3	**SOCIAL REVIEW**				
3.1	**Customer profile**				
3.1.1	Describe the general consumer profile i.e. Income levels, indigence, unemployment, literacy				
3.1.2	Describe the relationship between customers and the municipality and reasons?	The relationship between the community and the municipality appears positive. The community does communicate leakage to the municipality which indicates that the lines of communication are open	O	The existing relationship should be improved on and utilised to increasingly promote water conservation.	2
3.2	**Customer awareness**				

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY (1) High (3) Low
3.2.1	Are consumers informed regarding the value of water?	A water awareness community campaign was initiated by the municipality in September 2011. It is envisaged that the campaign will become an on-going initiative	S	The community awareness must become an annual on-going programme to make an impact. It can be monitored through KAP surveys conducted biannually in order to determine effectiveness and pertinent water services issues	2
3.2.2	What is the level of leakage reporting by the community and what method do they use?	The community frequently reports leakage through the customer care centre.	S	Ensure that the customer care line is continuously publicised to further encourage reporting of leakage.	3
3.2.3	What are the most prominent consumer behavioural challenges encountered by the municipality?	Unlawful connections and general wastage of water are the most pertinent behavioural challenges in the municipality.	T	The community awareness campaign should be tailored to address these problems. The councillors should be encouraged to make these issues an agenda at all public metering held in the different wards	2
3.2.4	Is xeriscaped gardening and rain water harvesting encouraged?				3
3.2.5	Are radio campaigns, bill board, pamphlets, informative billing used to inform and educate customers?	A radio campaign has been undertaken as part of the wider community awareness being implemented.	S		3
3.3	**Schools awareness**				
3.3.1	Number of primary and secondary schools?				
3.3.2	Frequency and scope of schools awareness campaigns?	A schools programme has been undertaken in one of the municipal clusters comprising 27 schools.	S	Huge benefit can be derived from the expansion of the schools programme. The section 21 schools in particular should be visited, monitored and encouraged to fix leakage as the O&M budgets are operated by the school management for this category of schools	3
3.3.3	Are goals and objectives monitored and controlled?				3
3.4	**Customer Care Centre**				
3.4.1	Does the municipality have a CCC and who operates it?	The municipality has a 24 hour call centre.	S	The customer care personnel should receive training on WC/WDM to ensure that they are knowledgeable and equipped to assist the consumers. This will help to improve the communication between the municipality and the community.	2
3.4.2	How and to whom are billing queries referred?				
3.4.3	To whom are the leak reports referred and do consumers have confidence in the reporting system?				
4	**TECHNICAL REVIEW**				
4.1	**Measurement and control**				

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY (1) High (3) Low
4.1.1	Is the system input volume measured, monitored and controlled?	There are currently no bulk meters. Measurement is taking place only at the water treatment works, therefore this aspect is not adequately monitored.	W	Bulk meters must be installed and read on a monthly basis.	1
4.1.2	Is the water supply system sectorised into zones and districts?	No sectorisation has taken place.	W	The water supply system must be sectorised into manageable sized areas to allow for improved monitoring.	2
4.1.3	Are the supply to the zones and districts metered?	There are no existing zone meters.	W	Zone meters must be installed and read on a monthly basis. The readings must be captured on a spread sheet	2
4.1.4	Is the system monitored through a telemetry system?	There is no telemetry system in place. As a result, reservoirs are frequently overflowing.	W	Due to the frequency of overflowing reservoirs, a telemetry system is recommended to monitor activity at the reservoirs	1
4.1.5	What is the Frequency and detail of your water balance calculation?				
4.1.6	Are minimum night flows, consumption trends and logging used to monitor the system?	No MNF and flow or pressure analysis is taking place.	W	Obtain and install logging equipment periodically on the bulk meters and conduct MNF analysis to determine leakage levels and areas experiencing high or low pressures	2
4.1.7	Are monthly management reports prepared and key performance indicators measured?	Management reports are produced on an ad hoc basis. No monthly management is undertaken	W	Prepare monthly reports on the NRW KPI's	2
4.2	**Physical leakage**				
4.2.1	What is the average age of the network, pipe material, replacement programme?	The majority of the network is very old. 70% of the network must be replaced ion the near future	T	Set aside 5% of the CAPEX budget for the replacement of the network	2
4.2.2	Number of burst pipes reported and repaired per week / month and the average response time?	Average response time for leak repair is 48hrs.	S	The response time of 48hrs must be maintained and continuously improved upon	2
4.2.3	What is the primary cause of burst pipes?				
4.2.4	Are active leak detection programmes conducted?	A service provider is contracted on an ad hoc basis to undertake leak detection on the network (approximately once a year)	S	Conduct active leak detection bi annually (twice a year) through the existing contractor.	3
4.2.5	How often and for how long do reservoirs overflow?	The reservoirs overflow frequently.	W	Install a real time telemetry system to monitor activity at the reservoirs	2
4.2.6	Are water losses from treatment processes (backwash, etc.) monitored and minimised?				
4.2.7	Is leakage on private properties a problem and if so, why?				
4.2.8	Are leaks on indigent private properties repaired and removal of wasteful devices encouraged?	The municipality does not fix leaks on private properties.	O	Undertake a leak audit as part of the community awareness campaign and determine the extent of internal plumbing leakage. Consider repairing leaks on indigent properties to decrease NRW	3
4.3	**Pressure management and control valves**				
4.3.1	What is the average and maximum system pressure?				

ITEM	CATEGORY	STATUS QUO	SWOT	STRATEGY	PRIORITY (1) High (3) Low
4.3.2	Is basic or advanced pressure management being implemented?	No pressure management is currently being implemented	O	Install PRV's in critical areas experiencing high pressures and monitor on a monthly basis	2
4.3.3	Are control valves pro-actively being maintained to prevent overflowing reservoirs?	No preventative measures for reservoir overflows are currently in place.	W	Existing control valves must be maintained or recommissioned to assist in the monitoring of reservoirs	1
4.4	**Consumer metering**				
4.4.1	Are domestic and non-domestic consumers metered and which type of meter is used?	75%-98% of the non residential consumers are metered and 50%-75% of residential consumers are metered.	O	Meter and bill 100% of non domestic connections as a priority and increasingly meter and bill the domestic consumers where practicable to increase revenue water	1
4.4.2	What is the condition, age and accuracy of water meters?				
4.4.3	Are the top consumers pro-actively monitored on a monthly basis?	No pro-active monitoring of the top consumers is currently taking place.	O	Initiate monthly monitoring of top non domestic consumers. Undertake a top consumer audit and ensure that all connections are metered and billed	2
4.4.4	Describe the water quality and its impact on consumer water meters?				
4.4.5	What is the prevalence and control of illegal connections?	There is a high prevalence of illegal connections. Removal of illegal connections takes place on an ad-hoc reactive basis, however reconnection of these connections is also a challenge	W	Undertake an illegal connection removal programme. Consider an amnesty programme where consumers with unlawful connections can come forward and report without prosecution	1
4.5	**Management information**				
4.5.1	Does the Municipality have an asset register and asset management programme?	There is no data management system in place to consolidate asset management data. The information is available but scattered and fragmented	W	Obtain an electronic asset management programme and institute an asset management programme. Utilise indigent community members to locate and clean the municipal infrastructure	2
4.5.2	What is the status and age of as-built drawings?	As-Built drawings are available digitally for the majority of the network and available in hard copy for the remainder of the network	T	Develop digital copies of the remainder of the network.	2

WC/WDM STRATEGY : Quantitative Scorecard

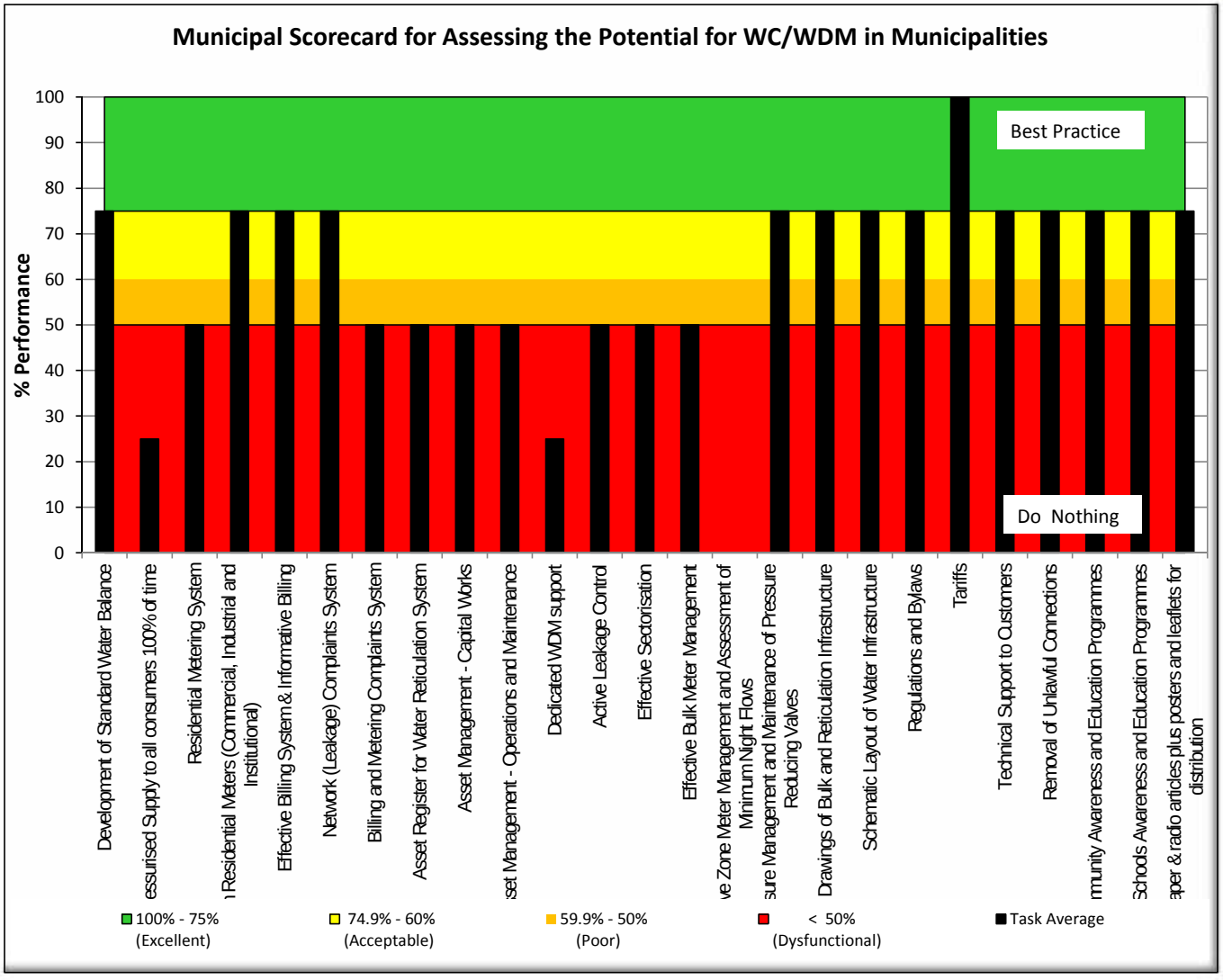
Municipality Name	Polokwane

Introduction

The purpose of the Water Conservation / Water Demand Management (WC/WDM) Scorecard is to ascertain the status quo of WC/WDM and evaluate the potential for WC/WDM measures to be implemented in these systems. The scorecard is also designed to enable the Regulator (Department of Water Affairs) to assess the current situation regarding losses and levels of wastage in all water supply systems countrywide. The scorecard consists of 25 multiple choice questions with each question getting scored from 0 to 4. The Regulator and WSA can track progress with each year the scorecard gets completed. Each question ends with an audit requirement which indicates what will be required by the Regulator should the questionnaire be audited. It also provides an indication on what is required in terms of each of the measures.

Supply area	Aug-11				Average
1. Development of Standard Water Balance	3				3
2. Pressurised supply to all consumers 100% of time	1				1
3. Residential Metering System	2				2
4. Non Residential Meters (Commercial, Industrial and Institutional)	3				3
5. Effective Billing System & Informative Billing	3				3
6. Network (Leakage) Complaints System	3				3
7. Billing and Metering Complaints System	2				2
8. Asset Register for Water Reticulation System	2				2
9. Asset Management - Capital Works	2				2
10. Asset Management - Operations and Maintenance	2				2
11. Dedicated WDM support	1				1
12. Active Leakage Control	2				2
13. Effective Sectorisation	2				2
14. Effective Bulk Meter Management	2				2
15. Effective Zone Meter Management and Night Flow Analysis	0				0
16. Pressure Management and Maintenance of Pressure Reducing Valves	3				3
17. As-Built Drawings of Bulk and Reticulation Infrastructure	3				3
18. Schematic Layout of Water Infrastructure	3				3
19. Regulations and Bylaws	3				3

Supply area	Aug-11				Average
20. Tariffs	4				4
21. Technical Support to Customers	3				3
22. Removal of Unlawful Connections	3				3
23. Community Awareness and Education Programmes	3				3
24. Schools Awareness and Education Programmes	3				3
25. Newspaper & radio articles plus posters and leaflets for distribution	3				3
Total score (maximum 100)	61	0	0	0	61



WCWDM STRATEGY AND BUSINESS PLAN : BUDGET AND CASHFLOW

Municipality name	Polokwane

COSTS

Item		Unit	Quantity / year	Rate	Year 1	Year 2	Year 3	Year 4	Year 5	Total
INSTITUTIONAL / LEGISLATIVE INTERVENTIONS										
Institutional review:					50%	50%				100%
CAPEX	Review organogram and fill vacancies	Sum	1	R 200 000	R 100 000	R 100 000	R 0	R 0	R 0	R 200 000
OPEX		Sum			R 0	R 0	R 0	R 0	R 0	R 0
Training and education :					50%	50%				100%
CAPEX	Not applicable	No	0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Assume one training course / employee / annum	No	100	R 5 000	R 500 000	R 500 000	R 500 000	R 500 000	R 500 000	R 2 500 000
Customer charter, policy, bylaws :						100%				100%
CAPEX	Review bylaws on 5 year cycles	Sum	1	R 200 000	R 0	R 200 000	R 0	R 0	R 0	R 200 000
OPEX	Enforce bylaws	Sum	1	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 500 000
FINANCIAL INTERVENTIONS										
Effective metering and billing :					50%	50%				100%
CAPEX	Perform meter audit	No	1	R 0	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Ensure proper metering and billing of all consumers	No	90 000	R 50	R 4 500 000	R 4 500 000	R 4 500 000	R 4 500 000	R 4 500 000	R 22 500 000
Water tariffs :						100%				100%
CAPEX	Review water tariffs, no cost	Sum	1	R 200 000	R 0	R 200 000	R 0	R 0	R 0	R 200 000
OPEX	Review water tariffs, no cost	Sum	0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
Informative billing :					50%	50%				100%
CAPEX	Improve invoice to show monthly consumption	Sum	1	R 200 000	R 100 000	R 100 000	R 0	R 0	R 0	R 200 000
OPEX	Distribute information with bill	Sum	90 000	R 50	R 4 500 000	R 4 500 000	R 4 500 000	R 4 500 000	R 4 500 000	R 22 500 000
SOCIAL INTERVENTIONS										
Consumer Awareness Campaign :					20%	20%	20%	20%	20%	100%
CAPEX	Install bill boards, design pamphlets, radio campaigns	Sum	25 000	R 50	R 250 000	R 250 000	R 250 000	R 250 000	R 250 000	R 1 250 000
OPEX	Target households on monthly basis with awareness campaign	No	25 000	R 50	R 1 250 000	R 1 250 000	R 1 250 000	R 1 250 000	R 1 250 000	R 6 250 000
Consumer Help and Support Desk :					50%	50%				100%
CAPEX	Improve existing help-desk to provide one-stop service	Sum	1	R 100 000	R 50 000	R 50 000	R 0	R 0	R 0	R 100 000
OPEX	Maintain help-desk	Sum	1	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 500 000
Schools awareness :					50%	50%				100%
CAPEX	Prepare schools competition, awareness, retrofit	No	45	R 20 000	R 450 000	R 450 000	R 0	R 0	R 0	R 900 000
OPEX	Monthly schools awareness campaign	No	45	R 2 000	R 90 000	R 90 000	R 90 000	R 90 000	R 90 000	R 450 000

Item		Unit	Quantity / year	Rate	Year 1	Year 2	Year 3	Year 4	Year 5	Total
TECHNICAL INTERVENTIONS										
Bulk metering :					50%	50%				100%
CAPEX	New meter installations required	No	10	R 50 000	R 250 000	R 250 000	R 0	R 0	R 0	R 500 000
OPEX	Maintenance of existing bulk meters	No	5	R 1 000	R 5 000	R 5 000	R 5 000	R 5 000	R 5 000	R 25 000
Sectorisation :					50%	50%				100%
CAPEX	Setup of new DMA / PMAs	No	15	R 50 000	R 375 000	R 375 000	R 0	R 0	R 0	R 750 000
OPEX	Maintenance of DMA / PMAs including step testing	No	15	R 25 000	R 375 000	R 375 000	R 375 000	R 375 000	R 375 000	R 1 875 000
Active Leakage Control :					50%	50%				100%
CAPEX	Not applicable	No	0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Fix all visible and reported leaks	No	1 443	R 1 000	R 1 443 000	R 1 443 000	R 1 443 000	R 1 443 000	R 1 443 000	R 7 215 000
Valve audits					50%	50%				100%
CAPEX	Locate, clean, repair, document network valves	No	2 886	R 4 000	R 5 772 000	R 5 772 000	R 0	R 0	R 0	R 11 544 000
OPEX	Maintain network valves	No	577	R 1 000	R 577 200	R 577 200	R 577 200	R 577 200	R 577 200	R 2 886 000
Leak and logging equipment :					100%					100%
CAPEX	Procure basic WDM equipment	Sum	10	R 20 000	R 200 000	R 0	R 0	R 0	R 0	R 200 000
OPEX	Not applicable	Sum	0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
Telemetry :						50%	50%			100%
CAPEX	Install telemetry sites	No	30	R 15 000	R 0	R 225 000	R 225 000	R 0	R 0	R 450 000
OPEX	Maintain telemetry sites	No	30	R 1 500	R 45 000	R 45 000	R 45 000	R 45 000	R 45 000	R 225 000
Retrofitting and removal of wasteful devices :					20%	20%	20%	20%	20%	100%
CAPEX	Retrofit government buildings, schools, etc.	No	9 000	R 1 000	R 1 800 000	R 1 800 000	R 1 800 000	R 1 800 000	R 1 800 000	R 9 000 000
OPEX	Not applicable	No	0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
Mains replacement :					20%	20%	20%	20%	20%	100%
CAPEX	Replace critical leaking mains	km	24	R 100 000	R 474 000	R 474 000	R 474 000	R 474 000	R 474 000	R 2 370 000
OPEX	Not applicable	km	0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
Pressure management :					20%	80%				100%
CAPEX	New pressure management installations	No	1	R 750 000	R 150 000	R 600 000	R 0	R 0	R 0	R 750 000
OPEX	Maintain pressure management installations	No	20	R 5 000	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 500 000
Control valve management :					50%	50%				100%
CAPEX	New control valve installations	No	0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Maintain all control valve installations	No	40	R 5 000	R 200 000	R 200 000	R 200 000	R 200 000	R 200 000	R 1 000 000
Consumer metering :						25%	25%	25%	25%	100%
CAPEX	New meter connections required	No	8 000	R 1 200	R 0	R 2 400 000	R 2 400 000	R 2 400 000	R 2 400 000	R 9 600 000
OPEX	Not applicable	No	923	R 1 200	R 1 107 600	R 1 107 600	R 1 107 600	R 1 107 600	R 1 107 600	R 5 538 000
Top consumer audit :					20%	20%	20%	20%	20%	100%
CAPEX	Audit and retrofit non domestic consumers	No	410	R 20 000	R 1 640 000	R 1 640 000	R 1 640 000	R 1 640 000	R 1 640 000	R 8 200 000
OPEX	Maintain non domestic consumers installations	No	82	R 10 000	R 820 000	R 820 000	R 820 000	R 820 000	R 820 000	R 4 100 000
GIS / CAD system :					50%	50%				100%
CAPEX	Setup CAD/ GIS system	Sum	1	R 200 000	R 100 000	R 100 000	R 0	R 0	R 0	R 200 000
OPEX	Maintain CAD / GIS system	Sum	1	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 500 000

Item		Unit	Quantity / year	Rate	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Management Information System :					50%	50%				100%
CAPEX	Setup basic MIS system to support WDM	Sum	1	R 200 000	R 100 000	R 100 000	R 0	R 0	R 0	R 200 000
OPEX	Maintain MIS system	Sum	1	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 100 000	R 500 000
Water loss monitoring and audits:					50%	50%				100%
CAPEX	Perform proper analysis of distribution network	Sum	0	R 500	R 0	R 0	R 0	R 0	R 0	R 0
OPEX	Perform ad hoc analysis to monitor interventions	Sum	8	R 10 000	R 80 000	R 80 000	R 80 000	R 80 000	R 80 000	R 400 000

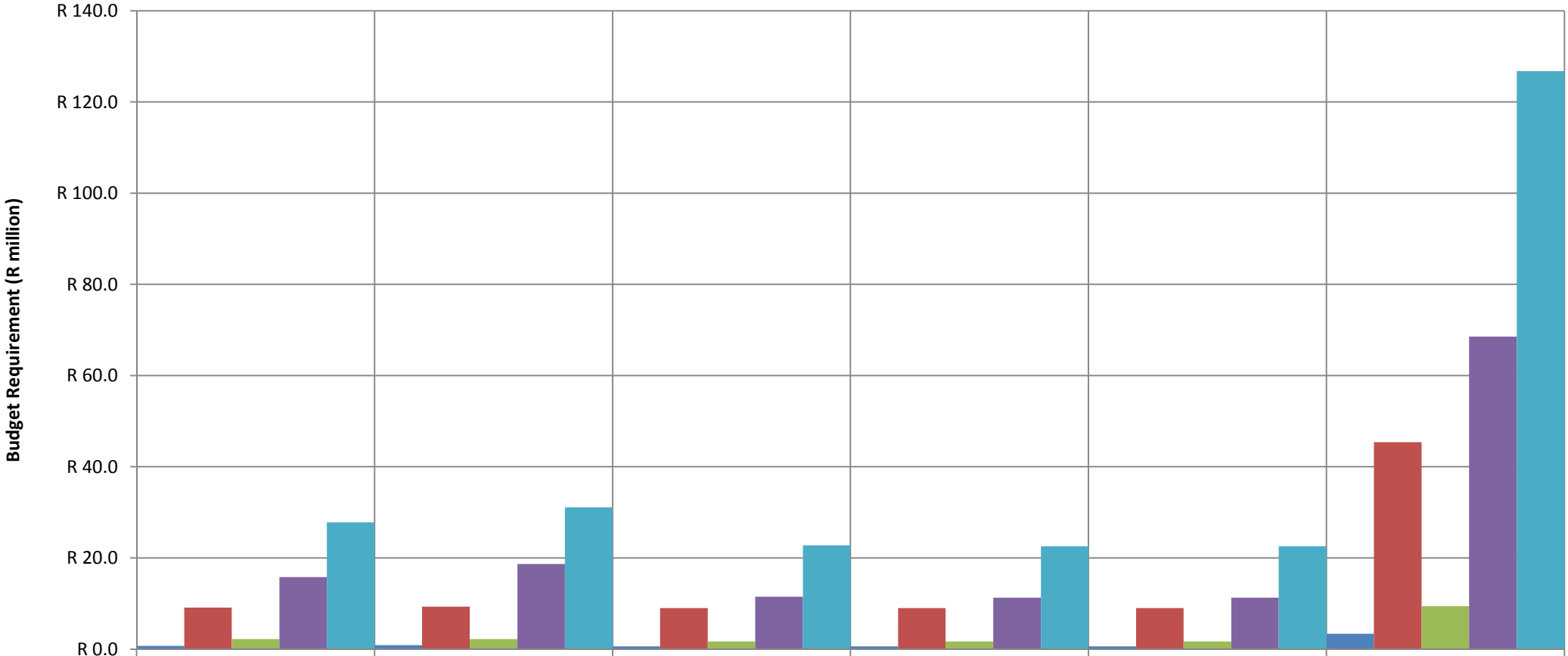
Item	Type		Year 1	Year 2	Year 3	Year 4	Year 5	Total
TOTAL COSTS								
Institutional	CAPEX		R 100 000	R 300 000	R 0	R 0	R 0	R 400 000
	OPEX		R 600 000	R 600 000	R 600 000	R 600 000	R 600 000	R 3 000 000
	TOTAL		**R 700 000**	**R 900 000**	**R 600 000**	**R 600 000**	**R 600 000**	**R 3 400 000**
Financial	CAPEX		R 100 000	R 300 000	R 0	R 0	R 0	R 400 000
	OPEX		R 9 000 000	R 9 000 000	R 9 000 000	R 9 000 000	R 9 000 000	R 45 000 000
	TOTAL		**R 9 100 000**	**R 9 300 000**	**R 9 000 000**	**R 9 000 000**	**R 9 000 000**	**R 45 400 000**
Social	CAPEX		R 750 000	R 750 000	R 250 000	R 250 000	R 250 000	R 2 250 000
	OPEX		R 1 440 000	R 1 440 000	R 1 440 000	R 1 440 000	R 1 440 000	R 7 200 000
	TOTAL		**R 2 190 000**	**R 2 190 000**	**R 1 690 000**	**R 1 690 000**	**R 1 690 000**	**R 9 450 000**
Technical	CAPEX		R 10 861 000	R 13 736 000	R 6 539 000	R 6 314 000	R 6 314 000	R 43 764 000
	OPEX		R 4 952 800	R 4 952 800	R 4 952 800	R 4 952 800	R 4 952 800	R 24 764 000
	TOTAL		**R 15 813 800**	**R 18 688 800**	**R 11 491 800**	**R 11 266 800**	**R 11 266 800**	**R 68 528 000**
Total	CAPEX		R 11 811 000	R 15 086 000	R 6 789 000	R 6 564 000	R 6 564 000	R 46 814 000
	OPEX		R 15 992 800	R 15 992 800	R 15 992 800	R 15 992 800	R 15 992 800	R 79 964 000
	TOTAL		**R 27 803 800**	**R 31 078 800**	**R 22 781 800**	**R 22 556 800**	**R 22 556 800**	**R 126 778 000**
			R 27 803 800	R 31 078 800	R 22 781 800	R 22 556 800	R 22 556 800	

BENEFITS

Item	Unit	Quantity	Rate	Year 1	Year 2	Year 3	Year 4	Year 5	Total
CHANGE IN CONSUMPTION									
Reduced input volume				20%	40%	60%	80%	100%	300%
Volume	m^3/annum	3 559 000		711 800	1 423 600	2 135 400	2 847 200	3 559 000	10 677 000
Amount	R / annum	3 559 000	R 5.14	R 3 658 652	R 7 317 304	R 10 975 956	R 14 634 608	R 18 293 260	R 54 879 780
Increased revenue water				20%	40%	60%	80%	100%	300%
Volume	m^3/annum	3 845 000		769 000	1 538 000	2 307 000	3 076 000	3 845 000	11 535 000
Amount	R / annum	3 845 000	R 10.00	R 7 690 000	R 15 380 000	R 23 070 000	R 30 760 000	R 38 450 000	R 115 350 000
Total	**R / annum**			**R 11 348 652**	**R 22 697 304**	**R 34 045 956**	**R 45 394 608**	**R 56 743 260**	**R 170 229 780**

Payback period - years **0.7**

WCWDM Five Year Budget Requirements



	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Institutional	R 700 000	R 900 000	R 600 000	R 600 000	R 600 000	R 3 400 000
Financial	R 9 100 000	R 9 300 000	R 9 000 000	R 9 000 000	R 9 000 000	R 45 400 000
Social	R 2 190 000	R 2 190 000	R 1 690 000	R 1 690 000	R 1 690 000	R 9 450 000
Technical	R 15 813 800	R 18 688 800	R 11 491 800	R 11 266 800	R 11 266 800	R 68 528 000
Total	R 27 803 800	R 31 078 800	R 22 781 800	R 22 556 800	R 22 556 800	R 126 778 000

WC/WDM Projection summary and targets

Municipality name	Polokwane

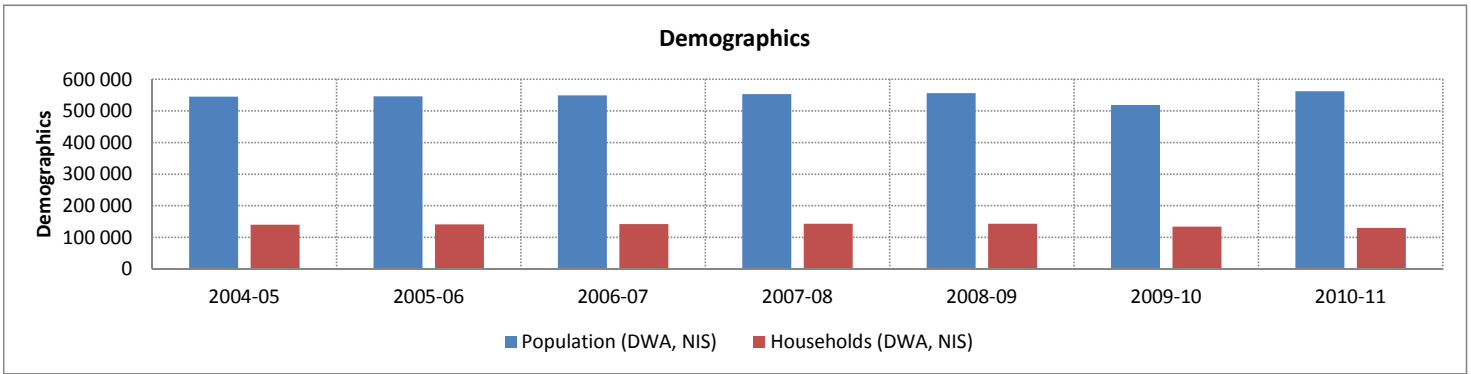
Water Demand projection	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Less 1.0% WDM Scenario							34.58	35.56	36.57	37.60	38.66	39.76
Less 3.0% WDM Scenario							34.47	35.32	36.20	37.10	38.01	38.95
Less 5.0% WDM Scenario							34.35	35.08	35.83	36.59	37.36	38.15
Actual Demand	16.84	16.06	18.73	25.25	31.77	33.56	34.64					
High population No WDM							34.64	35.68	36.75	37.85	38.99	40.16
Current Abstraction	25.19	25.19	25.19	25.19	25.19	25.19	25.19	25.19	25.19	25.19	25.19	25.19

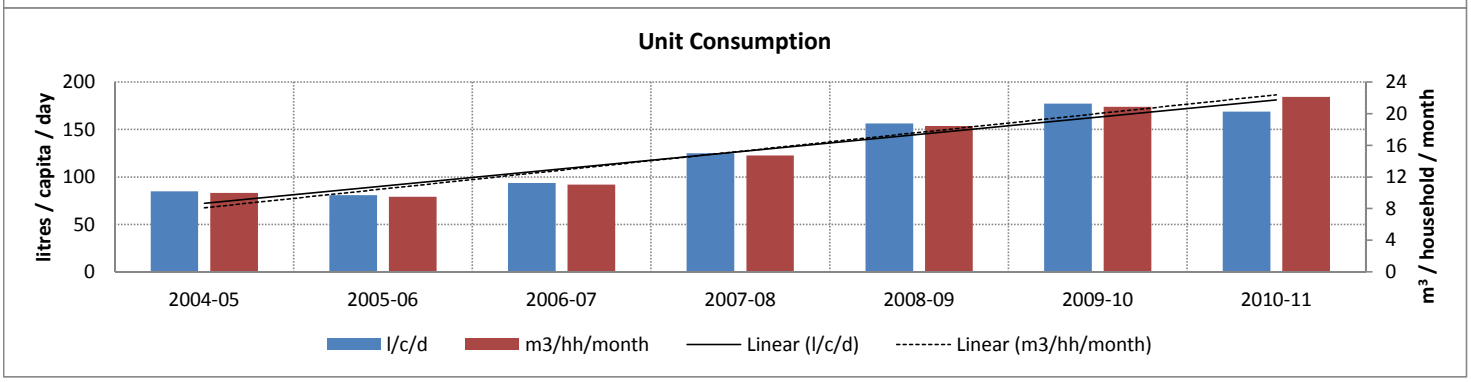
Savings	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Less 1.0% WDM Scenario							0.06	0.12	0.18	0.25	0.32	0.40
Less 3.0% WDM Scenario							0.17	0.36	0.55	0.76	0.97	1.20
Less 5.0% WDM Scenario							0.29	0.59	0.92	1.26	1.62	2.01
Actual savings							0.00					

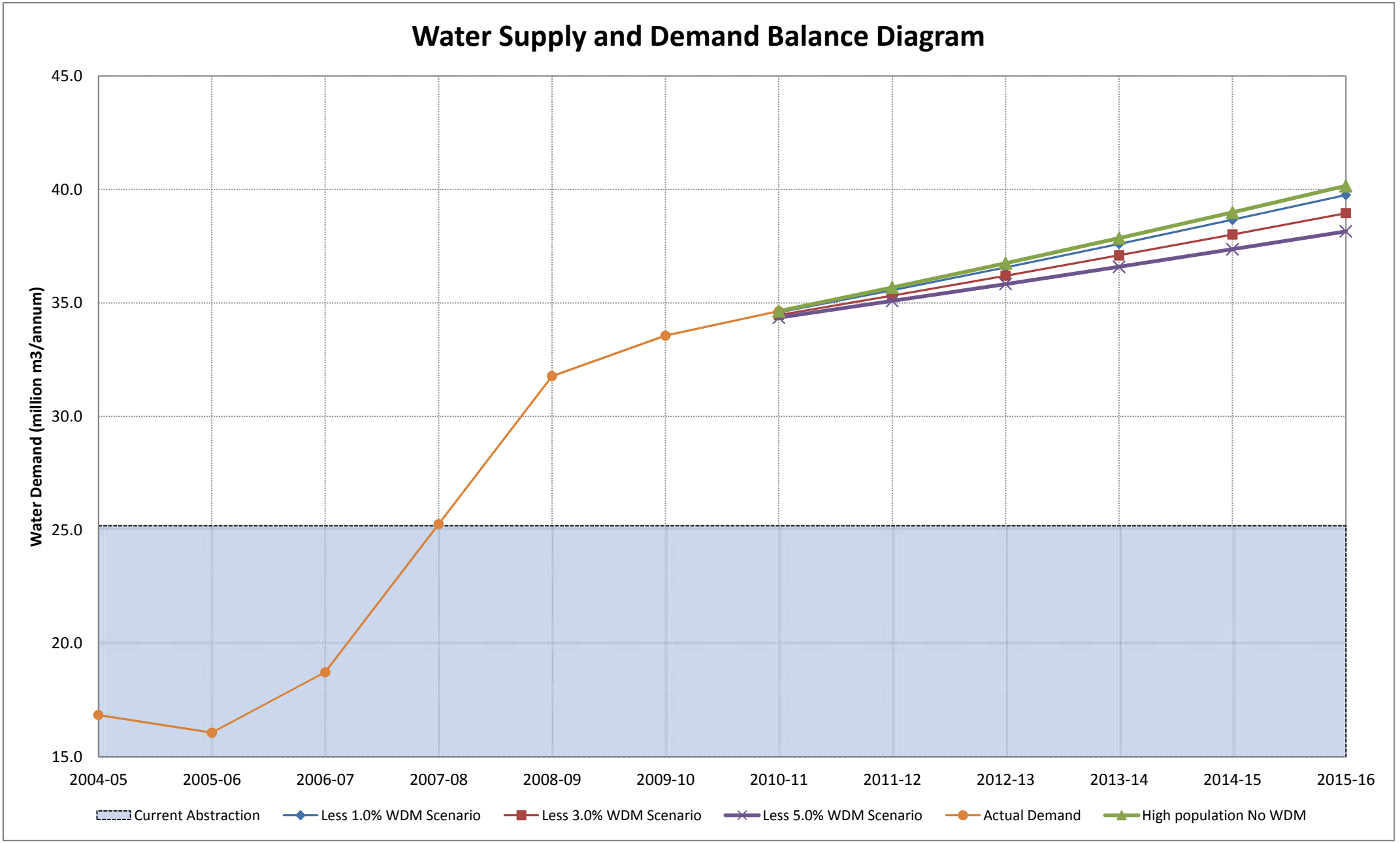
% Reduction	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Less 1.0% WDM Scenario							0.17%	0.33%	0.50%	0.67%	0.83%	1.0%
Less 3.0% WDM Scenario							0.50%	1.00%	1.50%	2.00%	2.50%	3.0%
Less 5.0% WDM Scenario							0.83%	1.67%	2.50%	3.33%	4.17%	5.0%

Year / Year % Growth	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Less 1.0% WDM Scenario								2.8%	2.8%	2.8%	2.8%	5.7%
Less 3.0% WDM Scenario								2.5%	2.5%	2.5%	2.5%	5.0%
Less 5.0% WDM Scenario								2.1%	2.1%	2.1%	2.1%	4.3%
Actual Demand		-4.6%	16.6%	34.8%	25.8%	5.6%	3.2%					
High population No WDM								3.0%	3.0%	3.0%	3.0%	3.0%

Key Performance Indicators	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Population (DWA, NIS)	544 548	545 816	549 087	553 203	556 524	518 674	561 772					
Households (DWA, NIS)	140 564	140 899	141 733	142 807	143 655	133 889	130 361					
l/c/d	85	81	93	125	156	177	169					
m3/hh/month	10	10	11	15	18	21	22					
Demand Ml/day	46	44	51	69	87	92	95					






Water Supply and Demand Balance Diagram
Water Demand (million m3/annum)
45.0
40.0
35.0
30.0
25.0
20.0
15.0
2004-05
2005-06
2006-07
2007-08
2008-09
2009-10
2010-11
2011-12
2012-13
2013-14
2014-15
2015-16
Current Abstraction
Less 1.0% WDM Scenario
Less 3.0% WDM Scenario
Less 5.0% WDM Scenario
Actual Demand
High population No WDM