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REPUBLIC OF SOUTH AFRICA

Support on the Continuation of the Reconciliation Strategy of the KwaZulu-Natal Coastal Metropolitan Area: Phase 2

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LIST OF ABBREVIATIONS

BWSS	Bulk Water Supply Scheme
DM	District Municipality
DWS	Department of Water and Sanitation
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
KZN	KwaZulu-Natal (Province)
LTBWSS	Lower Thukela Bulk Water Supply Scheme

LIST OF ABBREVIATIONS (CONT.)

MM	Metropolitan Municipality
MMTS	Mooi-Mgeni Transfer Scheme
MMTS2a	Mooi-Mgeni Transfer Scheme Phase 2a (Spring Grove Dam)
NWRS2	National Water Resources Strategy 2
O&M	Operation and Maintenance
SANBI	South African National Biodiversity Institute
SCA	South Coast Augmentation
SOF	System Operations Forum
SSC	Strategy Steering Committee
TWP	Thukela Water Project
UEIP	uMngeni Ecological Infrastructure Partnership
uMWP-1	uMkhomazi Water Project Phase 1 (Smithfield Dam)
WC/WDM	Water Conservation and Water Demand Management
WSA	Water Services Authority
WSS	Water Supply System
WTW	Water Treatment Works

1 INTRODUCTION

a) Background

In 2006 the Department of Water and Sanitation, DWS, (then Department of Water Affairs) commissioned the *Water Reconciliation Strategy Study for the KwaZulu-Natal Coastal Metropolitan Area* to develop a strategy for ensuring an adequate supply of water for the metropolitan areas in the central KwaZulu-Natal (KZN) region. The key objective of the Strategy is to identify, evaluate and prioritise the interventions that should be implemented to meet future water requirements. Within this context the Strategy is used as a decision support framework for making informed and timeous recommendations on interventions through a collaborative process involving stakeholders and institutions involved in the water supply cycle.

The study area of the Reconciliation Strategy extends from the Thukela River mouth on the KZN North Coast to the uMtwalume River on the South Coast and from Howick in the west to Durban in the east. It includes the eThekwini Metropolitan Municipality (MM), Msunduzi Local Municipality, as well as portions of uMgungundlovu, iLembe, and Ugu District Municipalities (DMs). The area consists of three main supply systems, namely the **Mgeni Water Supply System (WSS)**, the **South Coast WSS** and the combined **Mdloti-Mvoti WSS** (on the North Coast).

b) Study area

The location of the supply areas as well as the integrated nature and main sources of water are shown in **Figure 1.1**. This includes the Mooi-Mgeni Transfer Scheme (MMTS) with Mearns Weir (Phase 1) and the recently completed Spring Grove Dam (Phase 2), as well as linkages between the supply systems via the Northern and Western Aqueducts, as well as the South Coast Augmentation (SCA) and Lower Thukela Bulk Water Supply Scheme (LTBWSS) conveyance infrastructure.

More information in this regard is provided in the *Status Report: August 2014* (DWS, 2014).

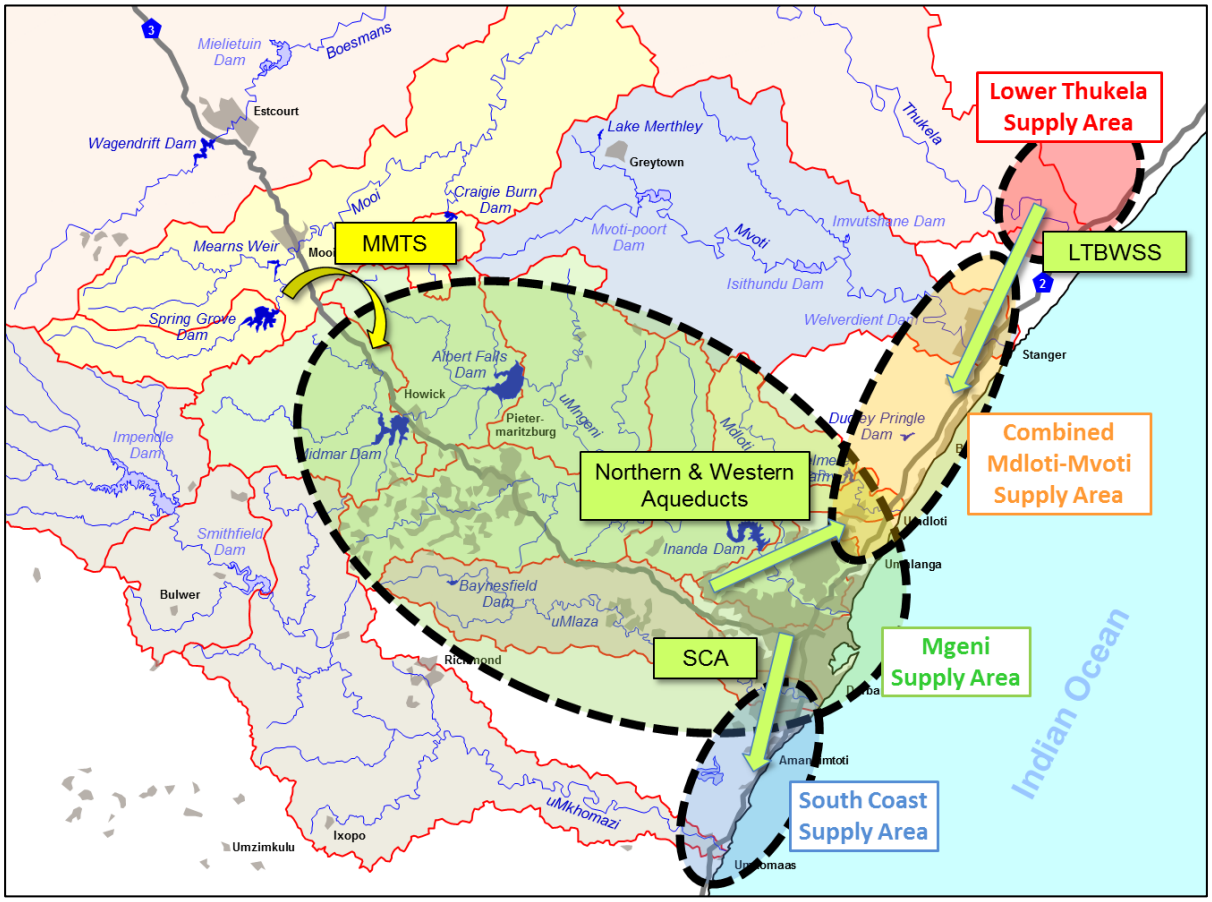

Figure 1.1: Study area of the Reconciliation Strategy

c) Purpose of report

The purpose of this document is to report on the current status of the Strategy as discussed and agreed upon at the 7th meeting of the *Strategy Steering Committee* (SSC) held on 25 February 2015. This included water supply challenges in the supply area, water requirement projections, water balances and the progress of a number of key short, medium, and long-term resource infrastructure projects required for the implementation of the Strategy.

A high level of emphasis was also placed on the cooperation with water services providers and authorities in the region to increase the efficiency of water use through ongoing water conservation and water demand management (WC/WDM) initiatives. Other initiatives such as the harvesting of rainwater could also play an important future role in supporting future water supply, particularly for new developments.

Finally, although the Strategy focuses on the planning of water resources over a planning horizon of 30 years, the short-term drought challenges currently being experienced in KZN were also discussed. It was acknowledged that emergency

relief work is already underway in the province. Within the focus area of the Strategy this includes a functioning emergency scheme at uMzinto to support the South Coast from the Mpanpanyoni River, as well as a scheme currently under construction on the North Coast to support Hazelmere Dam from the Tongati River.

Further information and previous reports on the Strategy can be obtained from the DWS website at:

http://www.dwaf.gov.za/Projects/KZN%20Recon/

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2 WATER REQUIREMENTS

A key component of the Reconciliation Strategy is realistic and up-to-date water requirement projections that guide the need for and timing of intervention options. Continuous updating and revision of water requirement projections ensures that the Strategy remains relevant by taking into account the various socio-economic and dynamic influencing factors that cannot be predicted with absolute certainty.

Prior to SSC Meeting 7, water requirements projections were reviewed and updated where necessary, specifically for the Mgeni WSS and South Coast WSS. The updated water requirement projections are included in the water balances presented in **Section 3**. The relevant sources of information are summarised below:

- Sales figures from Umgeni Water for 2013/2014.
- Both the *uMkhomazi Water Project Phase 1: Module 1: Technical Feasibility Study: Raw Water* (uMWP-1-1/RW) by the DWS and the *uMkhomazi Water Project Phase 1: Module 3: Potable Water Module* (uMWP-1-3/PW) by Umgeni Water.
- The *Umgeni Water Master Plan* (2014/2015).
- Liaison with the eThekwini MM and Umgeni Water with specific focus on the South Coast supply area.

As discussed in the *Status Report: August 2014* (DWS, 2014) overlaps between supply areas and potential for double-counting were carefully avoided, especially regarding the links between the Mgeni WSS and the North and South Coast supply areas through planned bulk infrastructure (as show in **Figure 1.1**).

Furthermore, the potential benefits of WC/WDM initiatives were also assessed and explicitly accounted for in the water requirement projections presented in **Section 3**. More information in this regard is provided in **Section 4.1**.

3 WATER BALANCES

3.1 MDLOTI-MVOTI WSS

Due to the inter-connectedness of the Mdloti and Mvoti systems on the North Coast, the water balances of these systems were integrated into a single water balance as presented in Figure 3.1.

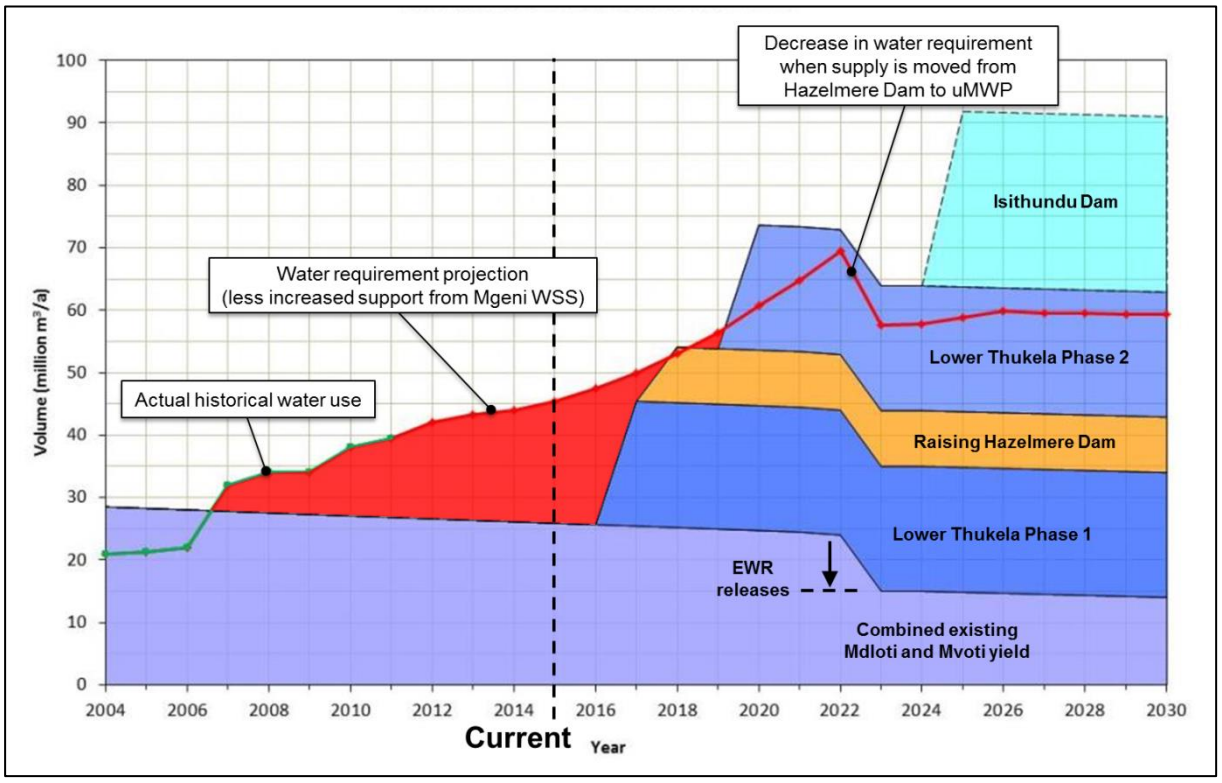

Figure 3.1: Mdloti-Mvoti water balance

The water balance clearly shows – and this is currently being experienced – that the North Coast is in a short-term shortfall situation (shown in red). The situation will improve, however, once Phase 1 of the *Lower Thukela Bulk Water Supply Scheme* (LTBWSS1) is commissioned. The figure further shows the rapid growth in water requirements anticipated on the North Coast that will require the following actions to maintain a positive water balance:

- LTBWSS1 is commissioned in 2016 (shown in a darker blue).
- The raising of Hazelmere Dam is completed by 2018 (shown in orange).
- LTBWSS2 is commissioned by 2019 (shown in light blue).
- The reduction of water requirements on the Mdloti-Mvoti WSS, represented by a decrease in the red water requirement projection line in 2023. This

results from moving a portion of the water supply from Hazelmere Dam onto the Mgeni WSS when the proposed uMkhomazi Water Project Phase 1 (uMWP-1) is commissioned. This water will be supplied via the Northern and Western Aqueducts. Note that this implies the need for commissioning uMWP-1 and the new Northern Aqueduct by 2023 (as discussed in later in Section 3.3).

- The implementation of the Reserve and associated Ecological Water Requirements (EWRs), which will require additional releases from Hazelmere Dam, is delayed until the implementation of the uMWP-1 (as discussed above). The impact of the EWR on the yield of the system is a decrease of approximately 10 million m^3/a (shown as a decrease in the light blue portion at the bottom of Figure 3.1).

Finally, if water from LTBWSS2 is used to support growing water requirements north of the Thukela, the remaining resources for supply into the Mdloti-Mvoti WSS will decrease. As shown in Figure 3.2 this may result in the need for developing Isithundu Dam on the Mvoti River by 2025 to avoid a shortfall in the Mdloti-Mvoti WSS.

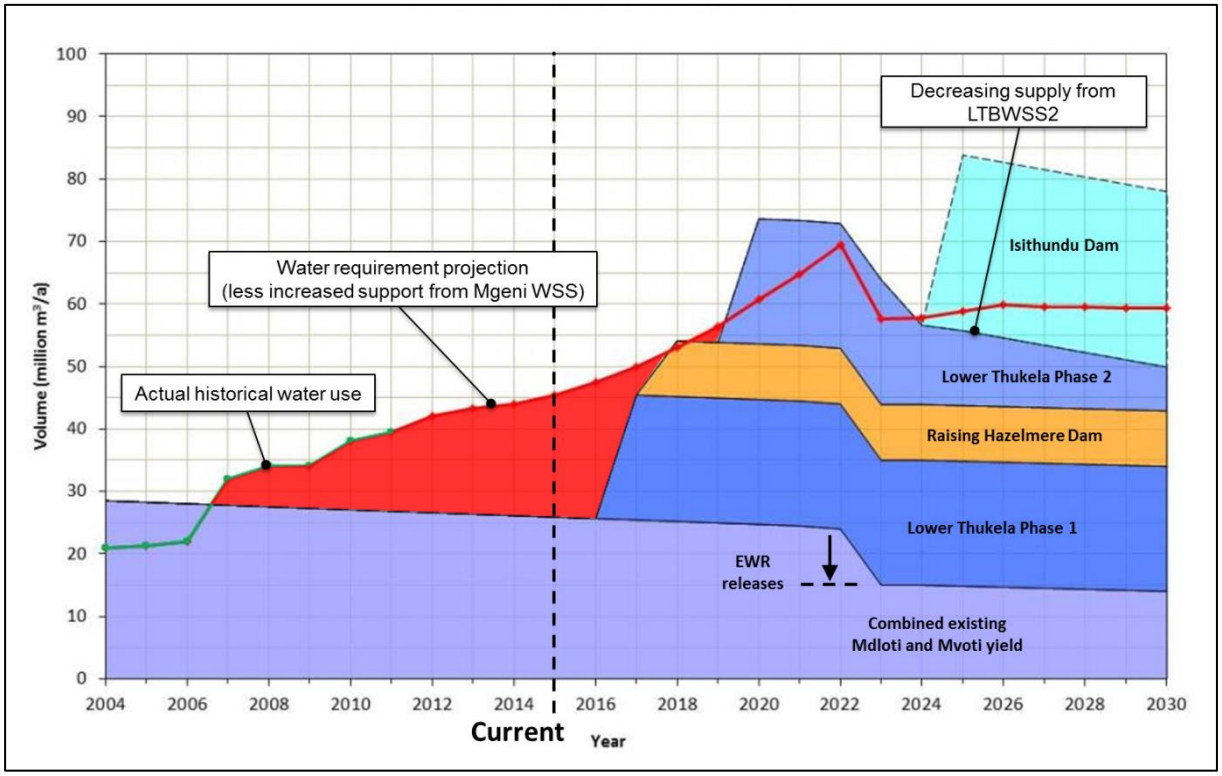

Figure 3.2: Mdloti-Mvoti water balance with decreasing support from LTBWSS2

3.2 SOUTH COAST WSS

The water balance for the South Coast WSS is shown in Figure 3.3. The existing water availability represents both local resources (shown in light blue) as well the support from the Mgeni WSS through the South Coast Augmentation (SCA) pipeline (shown in dark blue). Projected water requirements are shown as red lines, with the lower solid line including the possible benefit of WC/WDM initiatives.

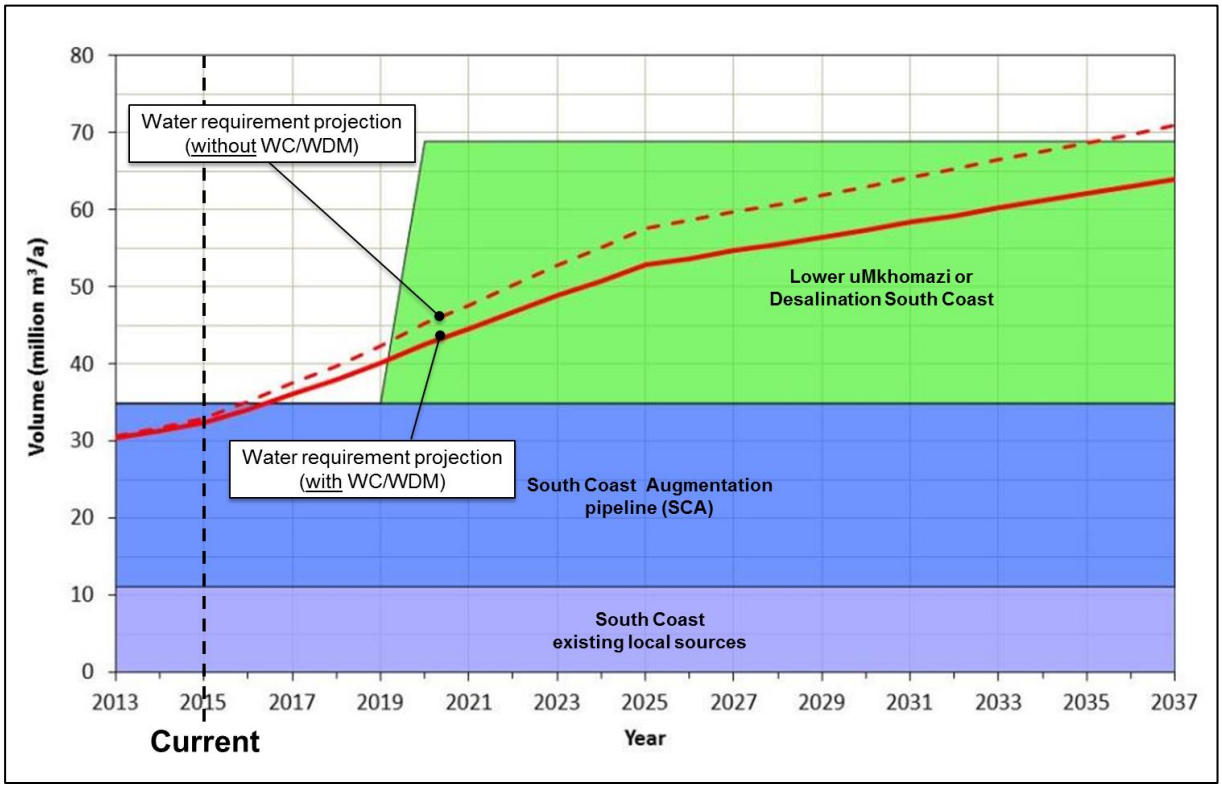

Figure 3.3: South Coast water balance with support from Mgeni WSS

Figure 3.3 also shows the augmentation of the South Coast by the implementation of either the proposed Lower uMkhomazi Bulk Water Supply Scheme (Ngwadini Dam, as discussed Section 4.7) or the desalination of seawater (both shown in green). The figure further shows that a short-term shortfall is likely around 2018 to 2019, but thereafter a positive water balance can be maintained, provided the following:

- WC/WDM initiatives are implemented and are successful in achieving the projected reduction in water requirements.
- The South Coast system is augmented by 2019.

Finally, the water balance in Figure 3.4 illustrates that once the South Coast is augmented, support currently provided from the Mgeni WSS through the SCA can be significantly reduced.

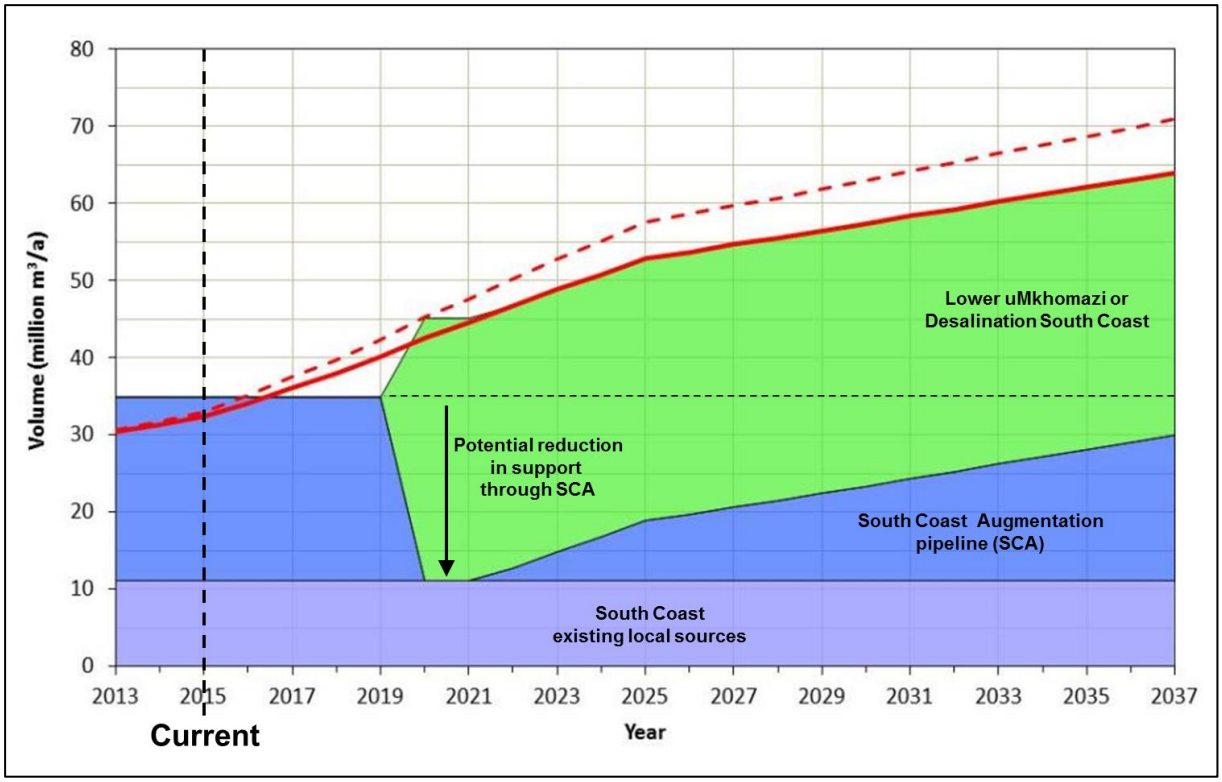

Figure 3.4: South Coast water balance with reduction in support from Mgeni WSS

3.3 MGENI WSS

At SSC Meeting 7 a number of possible options were discussed for the augmentation of the Mgeni WSS and the reconciliation of water resources and projected water requirements. These options are summarised below and the associated water balances in the figures thereafter.

- **Scenario 1**: Implementation of re-use of treated effluent or desalination of seawater on the North Coast, followed by the uMWP-1 (shown in Figure 3.5).
- **Scenario 2**: Implementation of both re-use and desalination on the North Coast, followed by a delayed uMWP-1 (shown in Figure 3.6).
- **Scenario 3**: Implementation of only uMWP-1 (shown in Figure 3.7).

It should be noted that the water requirement projection on all water balances account for the impacts of the following:

- The reduction in support from the Mgeni WSS to the South Coast after the implementation of either the proposed Lower uMkhomazi Bulk Water Supply Scheme or the desalination of seawater (as discussed earlier in Section 3.2), resulting in a decrease in the red line in 2019.
- Moving a portion of the water supply from Hazelmere Dam onto the Mgeni WSS (as discussed earlier in Section 3.1), resulting in an increase in the red line 2023.

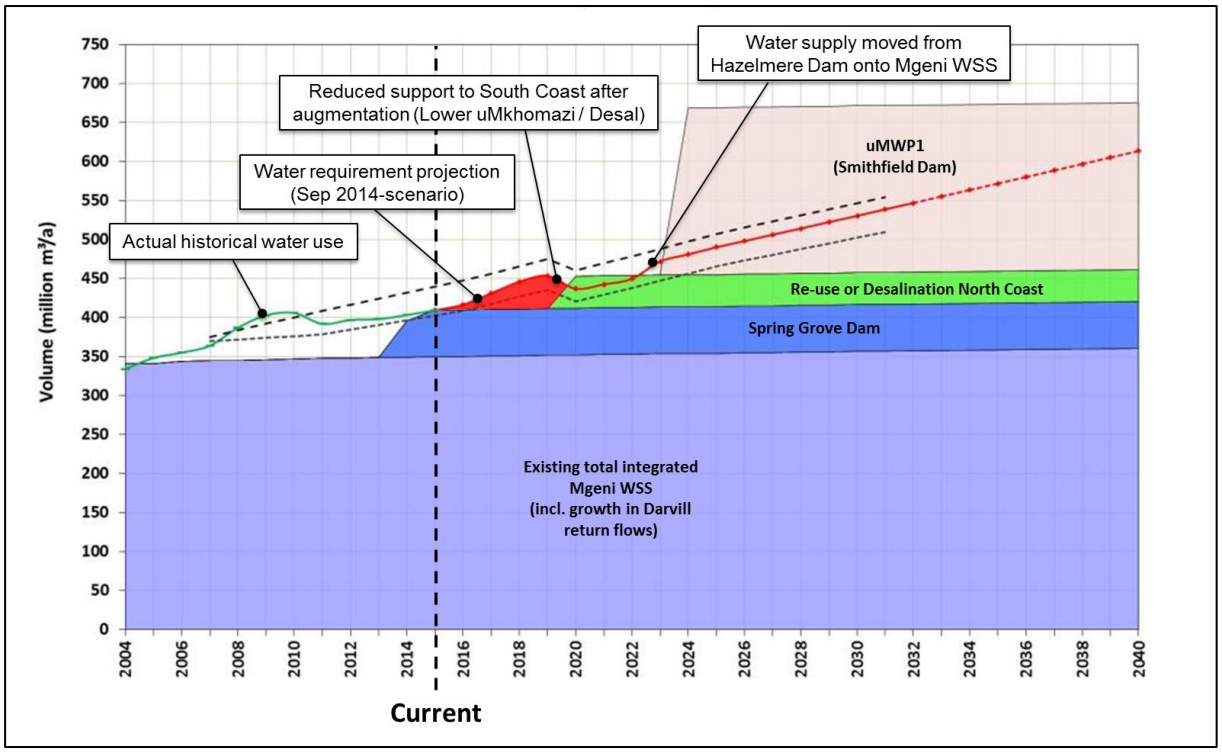

Figure 3.5: Mgeni water balance with re-use or desalination and then uMWP-1

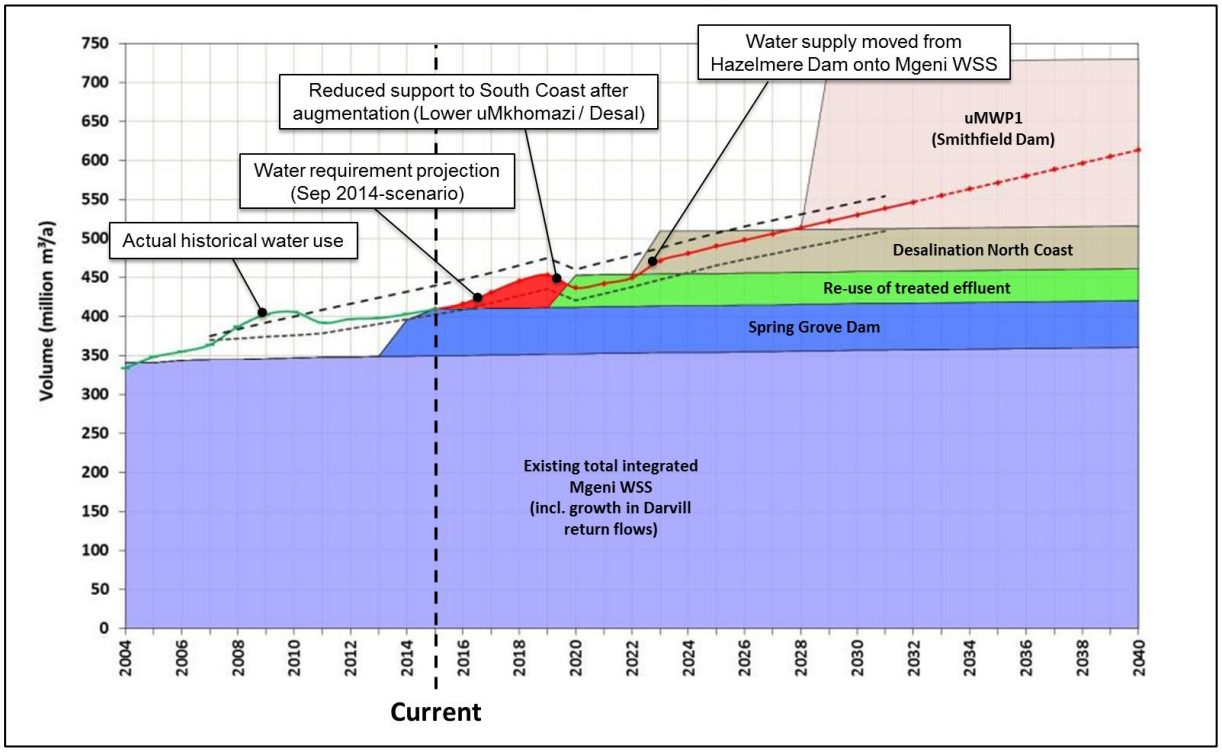

Figure 3.6: Mgeni water balance with both re-use and desalination and delayed uMWP-1

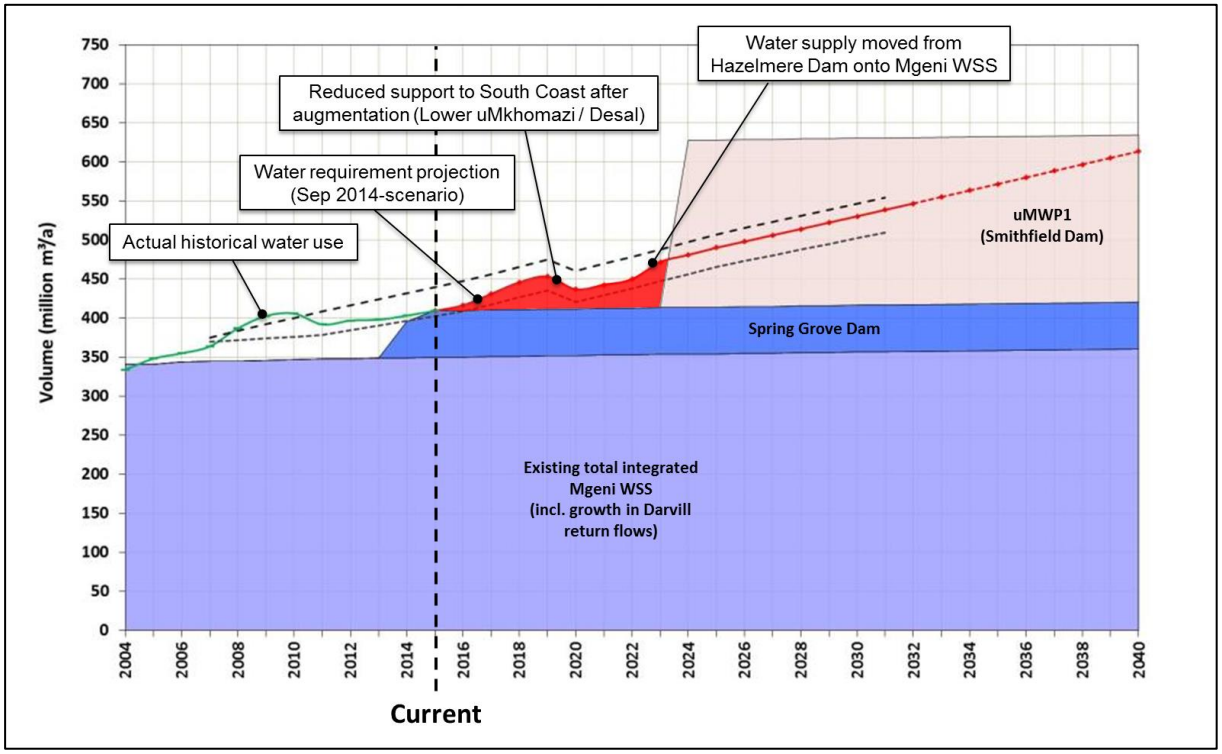

Figure 3.7: Mgeni water balance with uMWP-1 only

Based on the water balances for the reconciliation scenarios presented above the following is noted:

- Even with the recently commissioned MMTS2 (Spring Grove Dam) the Mgeni WSS is only in a positive water balance until 2016. Thereafter a short-term shortfall is again likely until the Mgeni WSS can be further augmented.
- If the re-use of treated effluent or desalination is implemented a positive water balance can be maintained from 2019. However, the uMWP-1 (Smithfield Dam) then still needs to be commissioned by 2023.
- If both re-use and desalination are implemented uMWP-1 can be delayed, although only for 5 years.
- Both re-use and desalination have high energy and O&M costs, which may result in these plants having to be mothballed when uMWP-1, which is a gravity scheme, comes on line.
- If uMWP-1 is implemented without re-use or desalination, a longer shortfall period of about six years is projected, from 2017 to 2022.

3.4 RISK ASSESSMENT

It is interesting to note that the six-year shortfall period mentioned in the last bullet-point above (i.e. from 2017 to 2022) will be similar in length and magnitude to that which has recently been experienced in the Mgeni WSS (i.e. over the period preceding the commissioning of Spring Grove Dam from 2006 to 2014). It should be borne in mind, however, that the region was fortunate to experience above average rainfall over that period and there is no guarantee that this will be the case over the projected six-year shortfall period.

Within this context, a risk assessment was undertaken to quantify the possible implications for water users in the Mgeni WSS of the projected shortfall period. This involved a comparison between the following:

- The risk of non-supply that is considered to be acceptable to water users, as defined by the **water user risk criteria** for the Mgeni WSS.
- The **projected risk of non-supply** in the system at the 2022-develolpment level (i.e. immediately prior to the earliest planned commissioning date of uMWP-1).

The approach and results are discussed below.

a) Water user risk criteria

The risk of non-supply that is considered to be acceptable to water users is defined by the water user risk criteria adopted for the Mgeni WSS. These criteria are summarised in Table 3.1 and shows the distribution of the total system water use volume across four risk classifications, namely "High", "Medium", "Low" and "Very Low", with the corresponding annual risks of non-supply (i.e. 5%, 2%, 1% and 0.5%, respectively).

Table 3.1: Water user risk criteria for the Mgeni WSS

User risk classification		Annual assurance of supply	Annual risk of failure	RI(1) of failure (years)	Volume (as % of total)
H	High	95%	5%	1:20	12%
M	Medium	98%	2%	1:50	12%
L	Low	99%	1%	1:100	13%
VL	Very Low	99.5%	0.5%	1:200	63%
Total:					**100%**

Note: (1) Recurrence interval.

b) Projected risk of non-supply

The projected supply of water to users in the Mgeni WSS was modelled using a sophisticated water resources systems model. The results were post-processed to quantify the projected risk of non-supply 2022. In that year the projected system water requirement totals approximately 450 million m^3/a. The results are presented in Figure 3.8, overlaid on the water balance for **Scenario 3** as discussed in Section 3.3 (i.e. uMWP-1 without re-use or desalination).

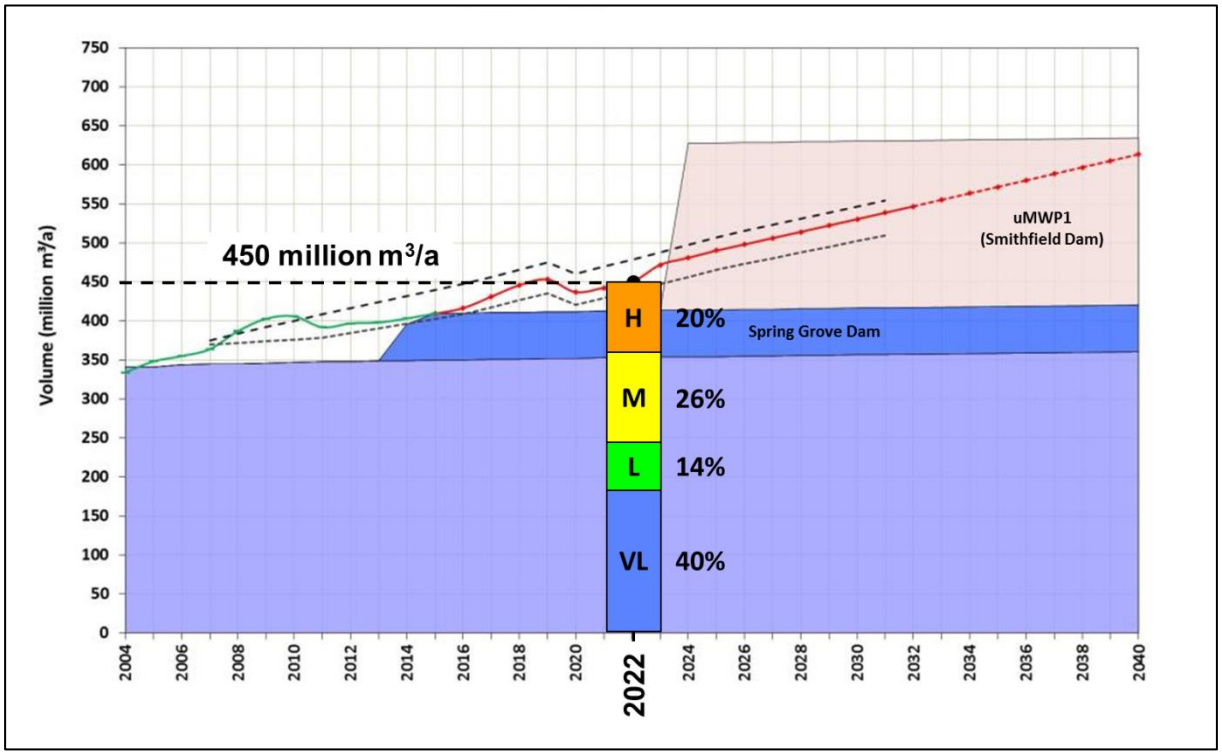

Figure 3.8: Projected risk of non-supply in 2022

c) Results

Based on the risk criteria (shown in Table 3.1) and projected risk of non-supply (shown in Figure 3.8) a comparison can be made between the target water supply and projected water supply for the Mgeni WSS in 2022. The result is presented in Figure 3.9 and can be interpreted as follows:

- The volume of water supplied at the “Very Low” risk category (shown in blue) will be approximately 20% lower than the target volume (i.e. from 63% to 40%).
- The volume of water supplied at both the “Medium” (yellow) and “High” (orange) risk categories will show a corresponding increase of approximately 10% each (i.e. from 12% to 26% and from 12% to 20%, respectively).
- These observations imply that the projected water requirements in the system can be met in 2022 without further augmentation, but that this would result in an increase in the risk of non-supply.

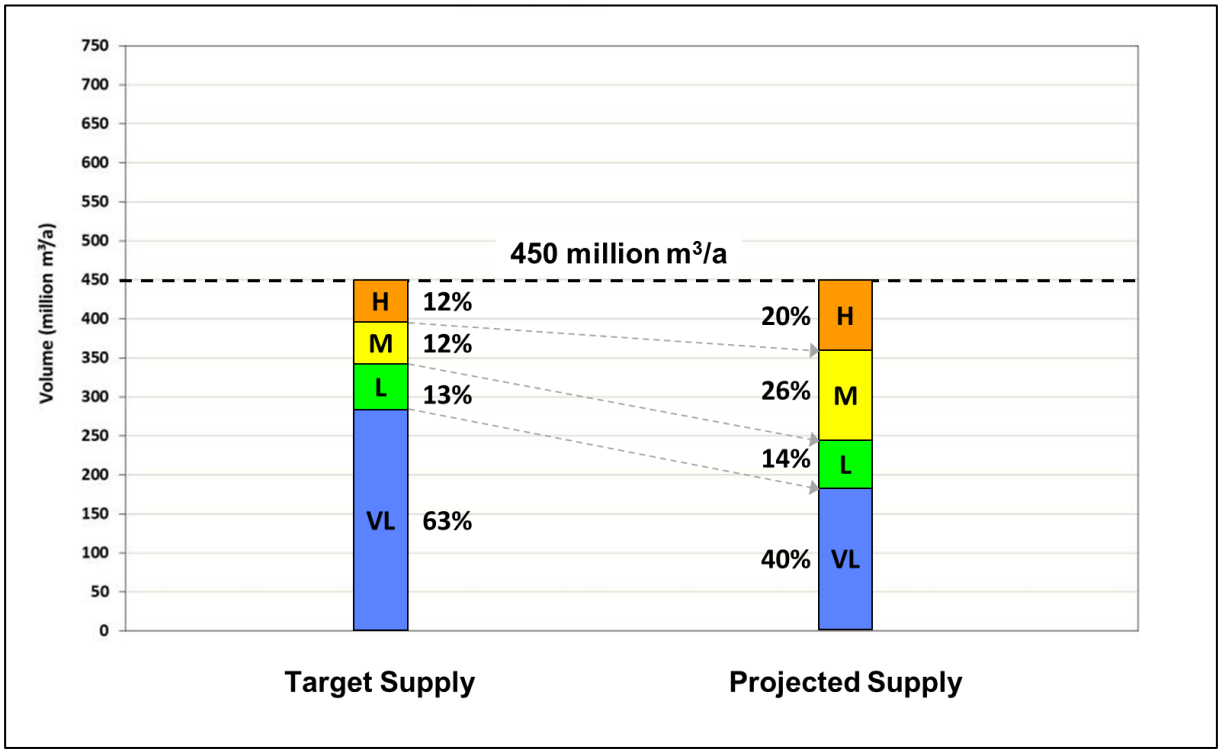

Figure 3.9: Comparison of target and projected water supply in 2022

The perception of whether the projected risks are acceptable will most likely vary from institution to institution, as well as from individual to individual. However, the risk should be evaluated against the potential monetary savings associated with not implementing costly interim intervention options (i.e. re-use or desalination). Furthermore, it is important to note that the risks are related to a supply deficit of around 10% (as shown in **Figure 3.8**), which is significantly lower than those currently being felt on the North Coast, where the deficit is close to 35% (see **Figure 3.1**).

Finally, the analysis was repeated to assess the impact of delaying the commissioning of uMWP-1 by 5 years to 2028. This analysis, again, assumed that neither of the interim intervention options (i.e. re-use or desalination) is implemented. The result is presented in **Figure 3.10** and shows that in 2027 (i.e. immediately prior to the delayed commissioning date) almost half of the volume of water (48%, shown in red) will be supplied at a risk greater than the “High” risk category.

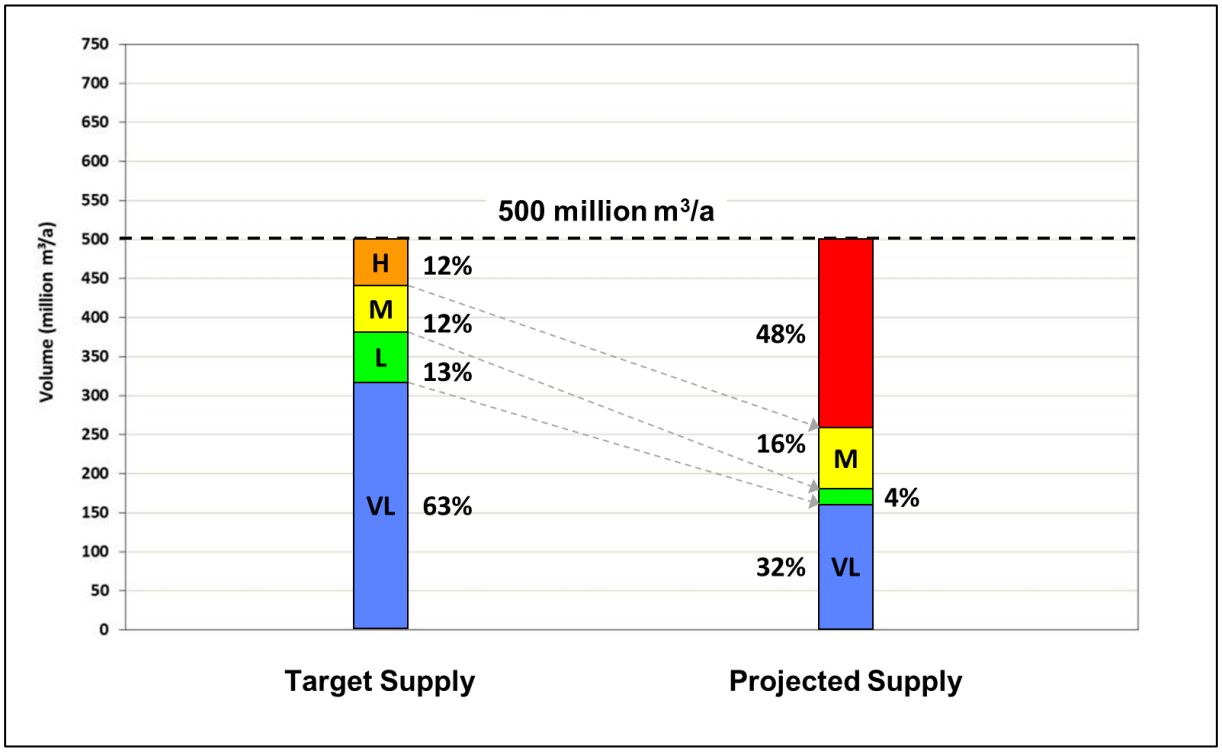

Figure 3.10: Comparison of target and projected water supply in 2027

Based on the above analysis it is clear that if the implementation of the uMWP-1 is delayed by 5 years (without either re-use or desalination) the risk of non-supply is much higher, resulting in more regular water restrictions and possibly significant negative socio-economic impacts. The implementation of the uMWP-1 therefore cannot be delayed and focused decision making and adherence to the project programme will be critical.

4 STATUS OF RECONCILIATION STRATEGY

An important aspect of updating the Strategy is the progress on the implementation and/or revision of target dates for the implementation of planned schemes and other intervention options, as well as the updating of water requirement projections (as described in **Section 2**). Target dates for intervention options were revised based on feedback from SSC members and discussions at SSC Meeting 7, and the updated list is provided in **Appendix A**. Key milestones and observations for each of the interventions are summarised below.

4.1 WC/WDM

Water conservation and water demand management (WC/WDM) is an important intervention for dealing with short- and medium-term water supply challenges. Due to the interconnectedness of the water supply systems in the Strategy area, a failure by any of the WSAs to implement and maintain appropriate WC/WDM initiatives will have a significant impact on all other users.

eThekwini MM, Umgungundlovu and Ugu DMs presented information at SSC Meeting 7 and summarised challenges and success with implementing WC/WDM. It was noted that:

- All three municipalities have a focussed strategy with associated budgets to implement WC/WDM initiatives.
- To ensure its success, WC/WDM must be viewed as more than simply a series of technical interventions as it depends heavily on social perceptions and behaviours and strong public support.
- Ageing infrastructure is one of the main causes of leaks.

Going forward, the WC/WDM strategies and associated potential savings on water requirements by each of the responsible municipalities will be more formally incorporated into the water balances and Reconciliation Strategy. Preliminary information on the 5-year WC/WDM Master Plans for five Water Services Authorities (WSAs) is presented in **Table 4.1**.

Table 4.1: Preliminary information on 5-year WC/WDM Master Plans

WSA[1]	Baseline (Mℓ/d)	5-year, no WC/WDM (Mℓ/d)	5-year, with WC/WDM (Mℓ/d)	Saving	
				(Mℓ/d)	(million m^3/a)
eThekwini	909	1031	943	88	32.0
Msunduzi	183	206	185	21	7.7
Ugu	111	113	102	11	4.0[2]
iLembe	63	79	74	5	1.8[2]
Umgungundlovu	To be confirmed[2]				
Total saving:	**Between 40 and 48 million m^3/a**				

Note: (1) Water Services Authorities.
(2) Partially located within Reconciliation Strategy area.

Finally, it was decided at SSC Meeting 7 that all municipalities (that are WSAs) will provide feedback at future meetings on WC/WDM implementation.

4.2 MOOI-MGENI TRANSFER SCHEME

The Mooi-Mgeni Transfer Scheme (MMTS) was developed to augment water supply to the Mgeni WSS, comprising the Mearns Weir, recently commissioned Spring Grove Dam on the upper Mooi River and associated conveyance infrastructure. Once commissioned in its entirety MMTS will increase the current yield of the Mgeni System by 60 million m^3/a (at Inanda Dam).

TCTA was instructed to implement the scheme on behalf of DWS and Spring Grove Dam (Phase 2A) was completed on 3 March 2014. Furthermore, 10 km of the 14.9 km Phase 2B pipeline has been completed, and commissioning is scheduled for July 2015.

4.3 NORTH COAST INFRASTRUCTURE

The North Coast has been experiencing rapid growth in recent years, increasing the water requirements above the available resources and infrastructure capacities.

4.3.1 Raising of Hazelmere Dam

The raising of Hazelmere Dam by 7 m with a piano key weir to increase the gross storage capacity from 23.9 to 43.7 million m^3 will augment the water supply to the North Coast area (from the Mdloti to the Thukela River) and sustain irrigation downstream of the dam. Progress to date includes the following activities:

- People displaced are being consulted by Land Matters and professional evaluators.
- Demolition of existing buildings and minor civil works has been completed.
- The valuation of affected properties is 50% complete.
- An Environmental Control Officer (ECO) has been appointed for the monitoring of compliance to environmental regulations.
- An archaeologist has completed an investigation on heritage sites and submitted a report.
- Construction:
    - The contract for Piano Key Weir has been awarded.
    - Contractor could be on site by September 2015.
    - Construction period is 24 months.
    - An estimated 300 jobs will be created over the construction period.

4.3.2 North Coast Pipeline and Hazelmere Supply Infrastructure

In line with the planned raising of Hazelmere Dam and anticipated increase in available water, Umgeni Water has proceeded with upgrading the water treatment and supply infrastructure linked to the dam. Progress is as follows:

- A new raw water pipeline from Hazelmere Dam to the Hazelmere water treatment works (WTW), upgrade of the Hazelmere WTW from 45 to 75 Mℓ/d and a pump station at the WTW. All have recently been completed.
- The WTW and new infrastructure can only be operated at the increased capacity on a sustained basis once the raising of Hazelmere Dam has been completed.

4.3.3 Lower Thukela Bulk Water Supply Scheme

Expected growth in water requirement in the KwaDukuza area will be met from the Lower Thukela Bulk Water Supply Scheme (LTBWSS). The scheme involves the abstraction of water from the lower Thukela River (near the SAPPI mill) and treatment at a regional WTW. Construction started in February 2014, comprising the abstraction works, pump stations, de-silting works, WTW and storage reservoirs. The construction of a gravity pipeline from the Mvoti reservoir to Darnall is also underway. It is anticipated that the scheme will be commissioned by mid-2016.

4.4 uMKHOMAZI WATER PROJECT

The first phase of the uMkhomazi Water Project (uMWP) comprises a new dam at Smithfield on the uMkhomazi River, water conveyance infrastructure (including a 32 km tunnel), a balancing dam and treatment plant in the uMlaza valley, as well as a gravity potable water pipeline connecting the uMWP to the Umgeni Water bulk distribution network. Although needed to augment the Mgeni WSS from 2017 onwards, the uMWP can only be implemented, at the earliest, by 2023. Institutional arrangements to ensure the timely implementation of this scheme are therefore of critical importance.

Feasibility studies currently being finalised by DWS and Umgeni Water provide the project layout and size of infrastructure components, for both the raw water and potable water components of the scheme. The specialist Environmental Impact Assessment (EIA) is underway and the aim is to present submissions to the relevant authorities by November 2015.

4.5 DIRECT REUSE OF TREATED WASTEWATER

In 2009 eThekwini MM initiated a study to assess the viability of reuse as an option to augment water availability in their area of supply. It was proposed that treated effluent from the KwaMashu and Northern wastewater treatment works is reclaimed and treated to potable standard for reticulation. However, public concerns and negative sentiment has since halted the process. It is therefore unlikely that this option will be pursued to address short-term water supply issues in the area.

4.6 DESALINATION OF SEAWATER

Umgeni Water is investigating the option of desalinating seawater as an alternative water supply source. A feasibility study is currently being finalised to investigate two 150 Mℓ/d plants, located at Lovu on the South Coast and Tongaat on the North Coast, respectively. The size of these plants is based on the capacity of existing and proposed bulk water supply infrastructure in these areas, which can be utilised to convey the potable water from the plants to the various distribution points. Current estimates show that the total cost of the infrastructure will be approximately R3 400 million, bringing the cost of water to between R10/kℓ and R15/kℓ. The EIA is underway and the feasibility study will be completed in the near future. Implementation can potentially be achieved by 2019.

However, it is noted that initial result indicates the Tongaat plant on the North Coast may not be required as the LTBWSS (discussed in **Section 4.3.3**) and raising of Hazelmere Dam (see **Section 4.3.1**) will address the short-term needs, while the medium- to long-term needs will be from the uMWP-1 (see **Section 3.1**). The feasibility of the Lovu plant depends on an economic comparison with the other proposed scheme for the South Coast, namely the Lower uMkhomazi BWSS (discussed below).

4.7 LOWER UMKHOMAZI BWSS

The Lower uMkhomazi Bulk Water Supply Scheme (BWSS) consists of an abstraction works on the uMkhomazi River, a 50 m high off-channel storage dam at Ngwadini (on a tributary of the lower uMkhomazi River), a 100 Mℓ/d WTW, pump station and pipeline to deliver water to the South Coast supply area. The scheme is an alternative to a desalination plant at Lovu on the South Coast (discussed above). Umgeni Water commenced with a detailed feasibility study on the scheme and this is expected to be completed by December 2015. The EIA is also currently underway. The estimated implementation date of the scheme is March 2022 at an estimate cost of R2 200 million.

4.8 MVOTI RIVER FEASIBILITY STUDY

The Mvoti River Feasibility Study involves assessing the development of a large dam on the Mvoti River, either at Isithundu or Welverdient, with a regional WTW and bulk distribution infrastructure. The proposed three-year study has been delayed, but DWS will continue with the study to ensure that the scheme can be implemented when required. If the scheme is found to be feasible, detailed design of the scheme may be undertaken from 2018 to 2020 and construction from 2020 to 2023. First water delivery is currently estimated at April 2024.

4.9 THUKELA WATER PROJECT DESKTOP STUDY

The Thukela Water Project (TWP) is a major proposed water resources development located in the upper Thukela River catchment. Although the TWP has been planned as an augmentation scheme for Vaal River System, the possibility has been proposed of fast-tracking a selected component of the project as a regional water supply option for KZN. In particular, the project could provide medium-term augmentation to the lower Thukela and, therefore, a portion of the

Reconciliation Strategy area. However, no further work has been undertaken on this option since the previous SSC meeting and may only be considered at a later stage.

4.10 CATCHMENT CARE

The *uMngeni Ecological Infrastructure Partnership* (UEIP) is a committee dedicated to maintaining and investing in "ecological infrastructure" (i.e. naturally functioning ecosystems that deliver valuable services to people) as a means to contribute to water security and improve water quality. This partnership is headed by the South African National Biodiversity Institute (SANBI) and is supported by a number of the SSC member institutions. The SSC recognises the importance of maintaining ecological infrastructure within the Reconciliation Strategy area and, as such, indicated their continued commitment to collaboration between the Strategy and the UEIP.

4.11 RAINWATER HARVESTING

At SSC Meeting 7 the potential benefits of rainwater harvesting and on-site water management solutions were discussed. In particular, the recent initiatives and achievements at the Dube Tradeport Agrizone on water management were highlighted. It was requested by the SSC that the benefits of rainwater harvesting be further explored as a way of improving water use efficiency in the Reconciliation Strategy area. In particular, the potential for implementing such approaches and technologies at new developments should be encouraged.

4.12 THE NATIONAL WATER RESOURCES STRATEGY

The KZN Reconciliation Strategy supports the *National Water Resources Strategy 2* (NWRS2) that has been approved by Cabinet and is currently being implemented. An important commitment made in the NWRS2 is that the DWS will continue, in partnership with stakeholders, to develop maintain Reconciliation Strategies for balancing water supply and water requirements into the future. Many of the initiatives of the KZN Reconciliation Strategy align with the key priority areas of the NWRS2 and this focused will be maintained.

4.13 MANAGEMENT OF SYSTEM OPERATION AND DROUGHT INTERVENTIONS

Further to the above interventions, the *Umgeni Water Supply System Operations Forum* (SOF) has been established to focus on improving system operation and the management of water restrictions in the event of a drought. The SOF met on 11 June 2014 and came to the conclusion that, at that time, the short-term water supply situation in the Mgeni WSS is not a concern, but that the situation must be monitored.

This information was presented and discussed at SSC Meeting 6, but subsequently the situation has deteriorated with rainfall in the wet season of 2014/2015 being below average. At SSC Meeting 7 the DWS KZN office reported back on the current situation and interventions in the province and the following was discussed on the schemes of concern:

- The two local dams supplying the Umzinto WTW reached critical levels when good rainfall and an Umgeni Water emergency scheme pumping water from the neighbouring Mpampanyoni River rescued the situation. Currently, storage levels are significantly improved. On-going monitoring is required particularly towards the drought operating decision date in May 2015.
- An emergency scheme from the Tongati River is currently being implemented to assist with the drought situation at Hazelmere Dam. Storage levels in the dam were below 40% at the time of SSC Meeting 7 and “Level 3” restrictions had been in place in parts of the supply area since December 2014. Without the emergency scheme and other planned interventions such as the fast tracking of the Northern Aqueduct by eThekwini (as discussed in **Section 3.3**), the dam is projected to run empty by September 2015.
- Further drought relief funds and interventions are being administered, following the declaration by the Premier of KZN of a *Provincial State of Disaster* due the continued drought conditions. The various activities and allocated budgets associated with the drought relief plans in iLembe, Umkhanyakude, Zululand, uThungulu and Ugu were presented at the SSC meeting.

It was agreed that while the drought situation in KZN requires short-term actions to resolve, the ongoing **long-term planning and implementation of the Reconciliation Strategy** are critical to managing the impact of similar future water scarcity situations.

5 REFERENCES

DWS, 2014. *Continuation of the Reconciliation Strategy of the KwaZulu-Natal Coast Metropolitan Area: Phase 2, Status Report: August 2014,* Pretoria, South Africa: DWS.

Appendix A

List of Intervention Options

Table A.1: Updated list of intervention options and target dates

Main scheme	Start date	End date	Comment/s
Mooi-Mgeni Transfer Scheme Phase 2A (DWS/TCTA)			
Spring Grove Dam	-	-	Completed
Water delivery via MMTS1	In progress	Jul 2015	Refurbishment of MMTS1 valves and manhole complete
Upgrade Mearns pump station and pipeline (3.2 m^3/s)	In progress	Dec 2015	-
Mooi-Mgeni Transfer Scheme Phase 2B (DWS/TCTA)			
Construction	Oct 2014	Apr 2015	-
Delivery via MMTS2B (1.8 m^3/s)	-	Dec 2015	-
Hazelmere Dam Raising (DWS)			
Contract	-	Nov 2012	
Preliminary design work and geotechnical investigation to confirm best option	Feb 2012	Oct 2014	
Decision to continue with raising of dam as an option	-	Apr 2015	Need confirmation from DWS (K Bester)
Finalise design/tenders	May 2015	Aug 2015	
Construction	Sep 2015	Jul 2017	
Delivery		2018/2019	DWS estimate (K Bester)
uMkhomazi Water Project Phase 1 (DWS)			
Feasibility Study (Raw Water)	Oct 2011	June 2015	EIA scoping completed, proceed with EIA
Feasibility Study (Potable Water)	Aug 2012	Jul 2014	-
Feasibility Study EIA	Nov 2012	Nov 2015	-
Decision to proceed with uMWP-1 and offtake agreements	Dec 2015	Dec 2016	-
Detailed design	Jan 2017	Dec 2018	-
Construction	Jan 2019	Dec 2022	-
Delivery (220 million m^3/a, or 214 with release to Lower uMkhomazi)	-	Apr 2023	-

Main scheme	Start date	End date	Comment/s
Mvoti River Scheme (DWS)			
Feasibility Study	Apr 2015	Apr 2018	Estimated start date (timeline moved)
EIA (including estuary)	Jun 2015	Apr 2018	-
Detailed design	Aug 2018	Jul 2020	-
Construction	Oct 2020	Oct 2023	-
Delivery	-	Apr 2024	-
Lower Thukela Bulk Water Supply Scheme (Umgeni Water)			
Construction Phase 1	Feb 2014	Jun 2015	Underway
Delivery Phase 1 (55 Mℓ/d)	-	Jun 2016	-
Construction Phase 2	Jul 2017	Dec 2018	Uncertain
Delivery Phase 2 (55 Mℓ/d, total 110 Mℓ/d)	-	Jan 2019	-
North Coast Pipeline and Hazelmere Supply Infrastructure (Umgeni Water)			
Construction pipeline from Honolulu to Mvoti pump station	-	Jun 2014	Pump station to Ballito experienced delays
Upgrade Hazelmere WTW	-	Jun 2014	Target completion before 2014 holiday season
Desalination of seawater (Umgeni Water)			
Feasibility Study	Jan 2012	Jun 2014	Awaiting report
Funding procurement, design and tender phase	Jan 2016	Jul 2017	1 year assumed starting 2016
Construction	Jul 2017	Jun 2019	2 years assumed
Delivery (150 Mℓ/d)	-	Jul 2019	Tongaat or Lovu options
Direct reuse of treated wastewater (eThekwini MM)			
Tender preparation and adjudication	Jan 2015	Jun 2015	-
Tender award, financing and site establishment	Jun 2015	Jun 2016	-
Construction and commissioning	Jul 2016	Jul 2018	-
Delivery (41 million m^3/a)	-	Jul 2018	-
Lower uMkhomazi Bulk Water Supply Scheme (Umgeni Water)			
Feasibility Study	Jul 2014	Dec 2015	
EIA (including estuary)	Aug 2014	Dec 2015	
Detailed design	Apr 2016	Apr 2017	
Construction	-	Mar 2022	
Delivery (100 Mℓ/d)	-	Mar 2022	Yield available before & after uMWP-1 with releases