water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

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

STATUS REPORT: AUGUST 2014

Project Name:	***Support on the Continuation of the Reconciliation Strategy of the KwaZulu-Natal Coastal Metropolitan Area: Phase 2***
Report Title:	***Status Report: August 2014***
Authors:	***Study Team***
DWS Contract No.:	***WP 10728***
AECOM Reference No.:	***J02172***
Status of Report:	***Final***
First Issue:	***2014/10/24***
Final Issue:	***2015/05/05***

Approved for:
AECOM SA (Pty) Ltd

FGB de Jager
Study Leader

HS Pieterse
Study Director

Approved for:
DEPARTMENT OF WATER AND SANITATION
Directorate: National Water Resource Planning

NJ van Wyk
Chief Engineer: National Water Resource Planning (East)

T Nditwani
Acting Director: National Water Resource Planning

Prepared by:

AECOM SA (Pty) Ltd
PO Box 3173
Pretoria
0001

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LIST OF ABBREVIATIONS

D: NWRP	Directorate: National Water Resource Planning
DM	District Municipality
DWA	Department of Water Affairs
DWS	Department of Water and Sanitation
EIA	Environmental Impact Assessment
EWR	Ecological Water Requirement
KZN	KwaZulu-Natal
LTBWSS	Lower Thukela Bulk Water Supply Scheme
MM	Metropolitan Municipality
MMTS	Mooi-Mgeni Transfer Scheme
NWRS2	National Water Resources Strategy 2
PSP	Professional Service Provider
SANBI	South African National Biodiversity Institute
SCA	South Coast Augmentation
SOF	System Operations Forum
SSC	Strategy Steering Committee
TCTA	Trans-Caledon Transfer Authority
TWP	Thukela Water Project
UEIP	uMngeni Ecological Infrastructure Programme
uMWP	uMkhomazi Water Project
WC/WDM	Water Conservation and Demand Management
WSS	Water Supply System
WTW	Water Treatment Works
WWTW	Waste Water Treatment Works

1 INTRODUCTION

1.1 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 though a collaborative process involving stakeholders and institutions involved in the water supply cycle.

With the completion of the Strategy in 2009 (DWA, 2009) the need was identified for support in its implementation and continuation to prevent future water shortages in the region. It is also recognised that, although several actions with proposed time scales were recommended, the Strategy must always be a dynamic plan that responds to changing requirements and priorities. For this purpose a high-level *Strategy Steering Committee* (SSC) was established in 2010 to make recommendations on longer-term planning activities required as part of the Strategy. A Professional Service Provider (PSP) was also appointed to provide technical support to the DWS and SSC to enable the necessary decisions to be made to give effect to the Strategy. The status of the Strategy was documented in a *Progress Report* published subsequent to the 5th meeting of the SSC (DWA, 2012) and provides a summary of the progress with the implementation of the main components of the Strategy.

On 1 March 2014 DWS appointed AECOM to undertake this Study, entitled *Support on the Continuation of the Reconciliation Strategy of the KwaZulu-Natal Coast Metropolitan Area: Phase 2* to continue providing administrative, scientific and technical assistance to DWS and the SSC for a period of three years in support of their function to ensure the continuation of the Strategy.

1.2 STUDY AREA

The study area of the Reconciliation Strategy is shown in **Figure 1.1** and extends from the Thukela River mouth on the KZN North Coast to the uMkhomazi 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 the uMgungundlovu, uMzinyathi, iLembe, Harry Gwala and Ugu District Municipalities (DMs).

The central and southern portion of the Study Area is largely supplied with water from the Mgeni Water Supply System (WSS), including Midmar, Albert Falls, Nagle and Inanda dams on the uMngeni River, and supplemented with transfers from the Mooi-Mgeni Transfer Scheme (MMTS), including Mearns Weir (Phase 1) and the recently completed Spring Grove Dam (Phase 2). To the north the area is supplied from the integrated Mdloti and Mvoti system which incorporates Hazelmere Dam.

The location of major existing and proposed dams in the study area are shown in **Figure 1.2**.

Figure 1.1: Study area

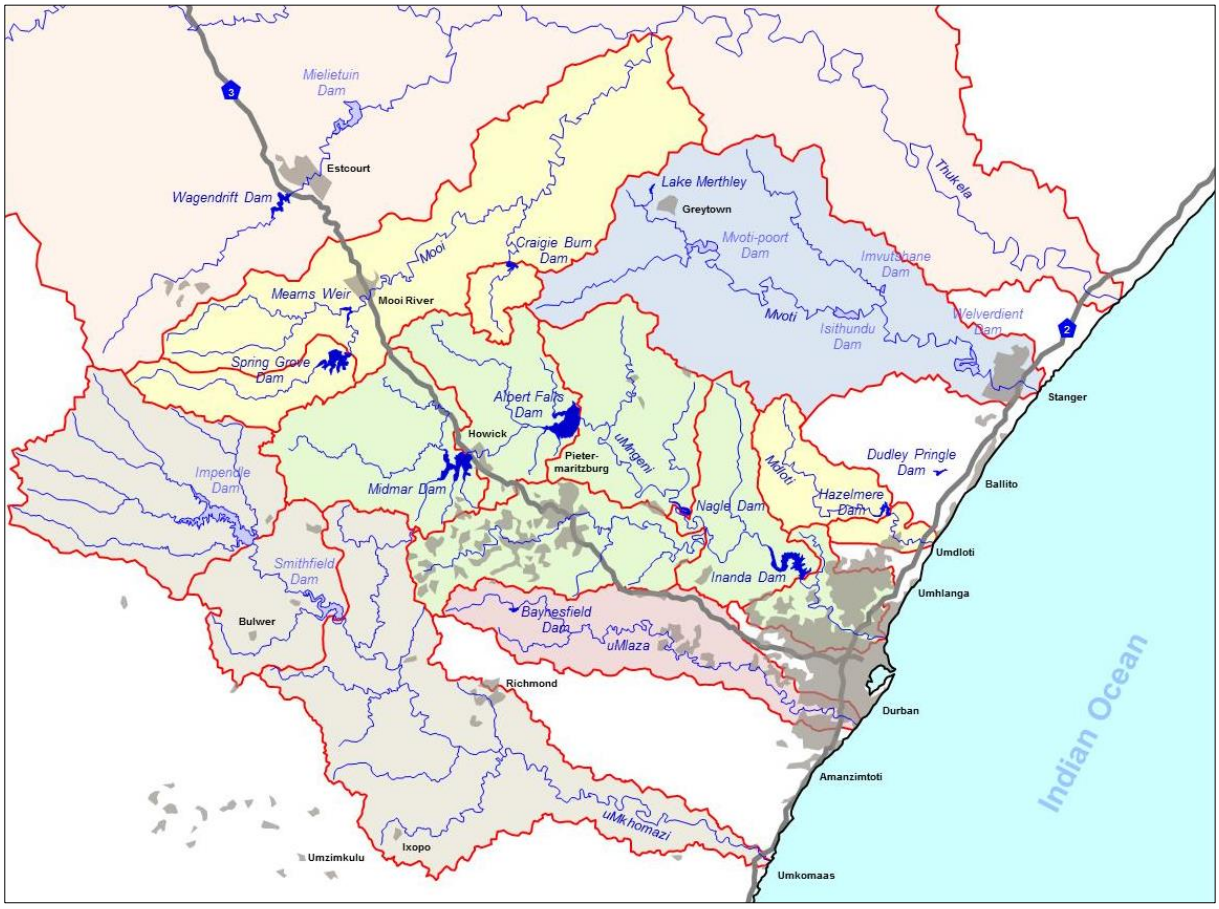

Figure 1.2: Major existing and proposed dams in the study area

1.3 PURPOSE OF THIS DOCUMENT

The 6th meeting of the SSC was held on the 24th of July 2014 to monitor progress with the implementation and continuation of the Strategy and water supply challenges in the area. The purpose of this document is to report on the current status of the Strategy as discussed and agreed upon at the SSC meeting, including aspects relating to water supply challenges in the supply area, water requirement projections, water balances and initiatives required for the implementation of the Strategy.

Further information and previous reports on the Strategy can be obtained from the DWS website at http://www.dwa.gov.za/Projects/KZN%20Recon/

2 WATER SUPPLY CHALLENGES

The Reconciliation Strategy identifies and prioritises essential interventions necessary to meet the growing water requirements in the supply area shown in Figure 2.1. The Strategy considers both requirement-side interventions, such as water conservation and water demand management (WC/WDM) initiatives, and supply-side interventions such as the implementation of water transfer schemes, commissioning of dams, water reuse and the desalination of seawater. Various factors are considered in selecting the appropriate phasing and order of interventions to meet growing water requirements, such as the practical implementation dates of schemes, the required regulatory approvals, design and funding as well as the unit cost of water. Building large capital projects such as dams are major undertakings that require significant lead times and funds to implement.

Until recently the water situation in the KZN Coast Metropolitan Area was such that water use already exceeded the assured supply of water from the Mgeni WSS. Fortunately, good rainfall was experienced during this period until Spring Grove Dam could be completed and the potentially devastating effects of a drought were avoided. However, due to the continuing growth in water requirements the water balance in the Mgeni WSS will not be in a positive situation for long. Planning and decision making is thus again at a critical stage to ensure that the implementation of the Strategy is followed and that further required interventions can be implemented timeously.

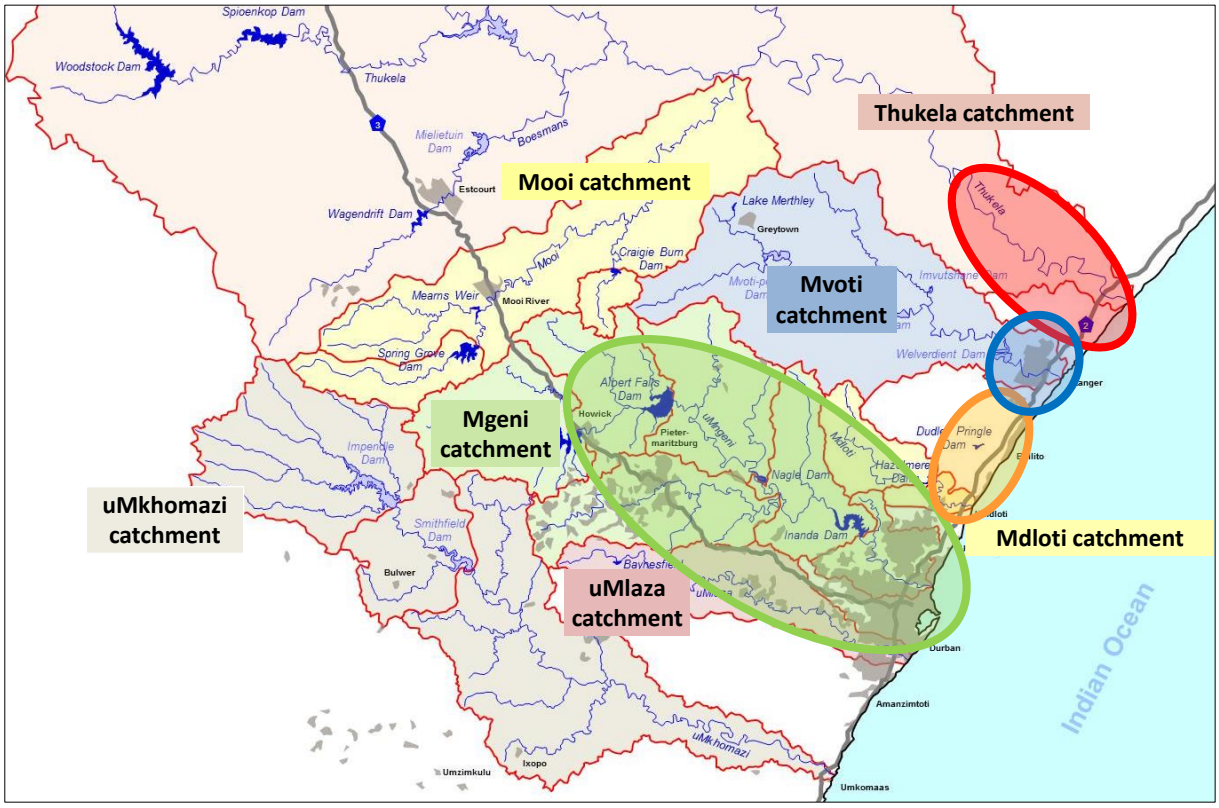

Figure 2.1: Supply areas investigated as part of the Reconciliation Strategy

3 WATER REQUIREMENTS

A key input into the water balance of water supply systems, which guides the timing and phasing of intervention options, is realistic and up-to-date water requirement projections. Updating of water requirement projections on a regular basis is a key part of ensuring the Reconciliation 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 No. 6 the water requirements of the KZN Coast Metropolitan Area were reviewed and updated, specifically for the uMngeni and Mdloti river catchment areas. 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* (uMWP1-1/RW) by the DWS and the *uMkhomazi Water Project Phase 1: Module 3: Potable Water Module* (uMWP1-3/PW) by Umgeni Water.
- The *Umgeni Water Master Plan* (2012/2013).
- Liaison with eThekwini MM and Umgeni Water with specific focus on the South Coast supply area.

Since many of these studies and sources of information are compiled by different institutions and at different spatial scales a key activity in creating consolidated water requirement projections for the Strategy was identifying overlaps of water supply area definitions. Once these overlaps were identified and understood, the double-counting or omissions of water requirements could be correctly handled when integrating the different data sources. Two particular cases of such overlap and potential for double-counting water requirements occur in the areas where current and planned bulk infrastructure link the Mgeni WSS with the North and South Coast supply areas.

The revised water requirement projections were applied in the updated water balances of the KZN Coast Metropolitan Area, as discussed in **Section 4**. For reference purposes these were plotted together with water requirement projections used in the previous phase of the Reconciliation Strategy.

4 WATER BALANCES

4.1 MDLOTI AND MVOTI SYSTEM

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 4.1. The water balance clearly shows that the North Coast is currently in a short-term shortfall situation (shown in red), which will be resolved once Phase 1 of the *Lower Thukela Bulk Water Supply Scheme* (LTBWSS1) can be commissioned in 2016 (shown in dark blue).

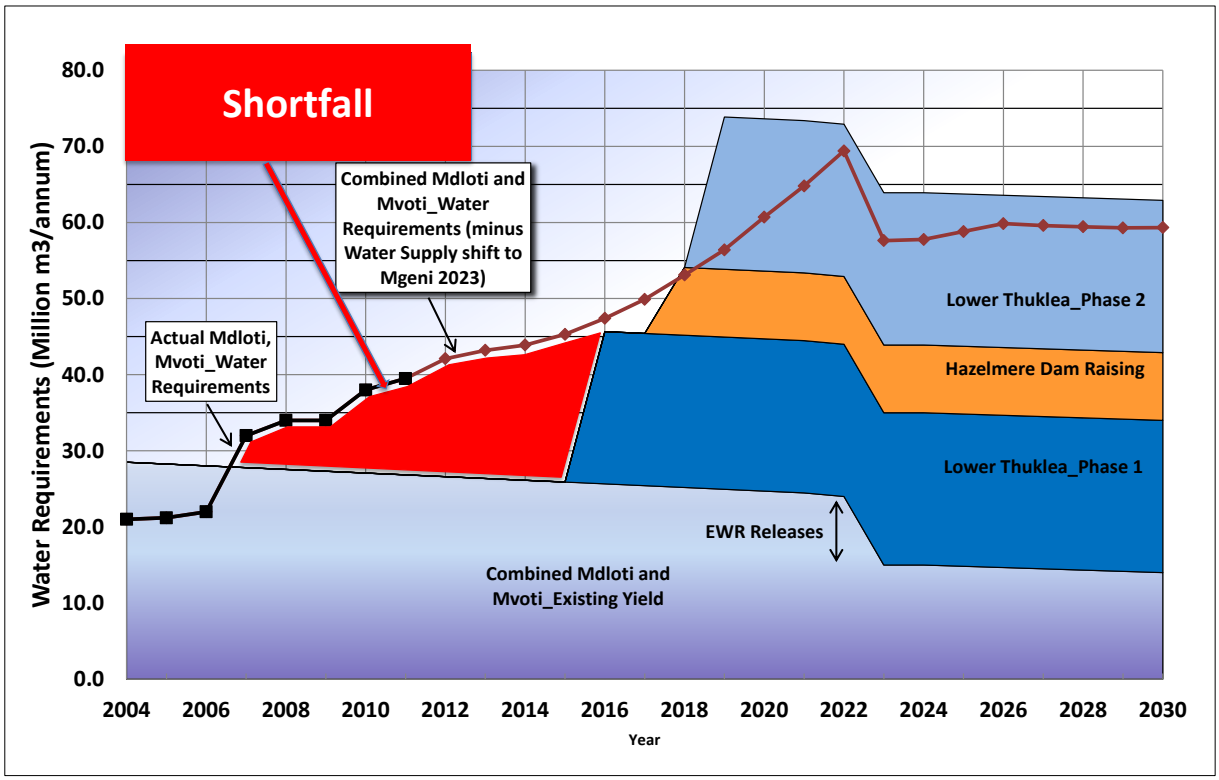

Figure 4.1: Water balance for the integrated Mdloti and Mvoti system

The figure further shows that a positive water balance can be maintained in the integrated Mdloti and Mvoti system, provided that:

- LTBWSS1 is commissioned in 2016.
- The planned raising of Hazelmere Dam is completed by 2018 (shown in orange).
- LTBWSS2 is commissioned by 2019 (shown in light blue).
- Implementation of the "load shift", which involves the moving of water requirements currently supplied from the Mdloti system onto the proposed

uMWP1 supply area by 2023 (represented by a decrease in the water requirement projection line). Note that this implies the commissioning of the uMWP1 and the new Northern aqueduct by that date, as discussed later in **Section 4.3**.

- The implementation of ecological water requirements (EWRs), with associated releases from Hazelmere Dam, is delayed until the implementation of the load shift in 2023. The impact of the EWR on the combined yield of the integrated Mdloti and Mvoti systems is shown in **Figure 4.1** as a decrease of approximately 10 million m^3/a.

4.2 SOUTH COAST SYSTEM

The water balance for the South Coast system is shown in **Figure 4.2** and **Figure 4.3**. The existing water availability (shown in blue) represents both local resources as well the support potential from the Mgeni WSS through the South Coast Augmentation (SCA) scheme – which was recently increased through the implementation of a new booster pump station. Projected water requirements are shown as red lines, with the lower solid line representing the reduced projection that is considered to be realistically achievable through the implementation of WC/WDM initiatives.

Figure 4.2 represents the situation where the South Coast is augmented by the implementation of the proposed Ngwadini Dam off-channel storage dam, which will form part of the Lower uMkhomazi Bulk Water Supply Scheme as discussed later in **Section 5.8**.Similarly, this option could also be represented by the augmentation of the South Coast through the desalination of seawater, with these options having similar possible implementation dates and water supply potential. The water balance in **Figure 4.3** is similar to that of **Figure 4.2**, but illustrates that once the South Coast is augmented through a new scheme (such as Ngwadini Dam or desalination), support currently provided to the South Coast from the Mgeni WSS through the SCA can be reduced over the long-term.

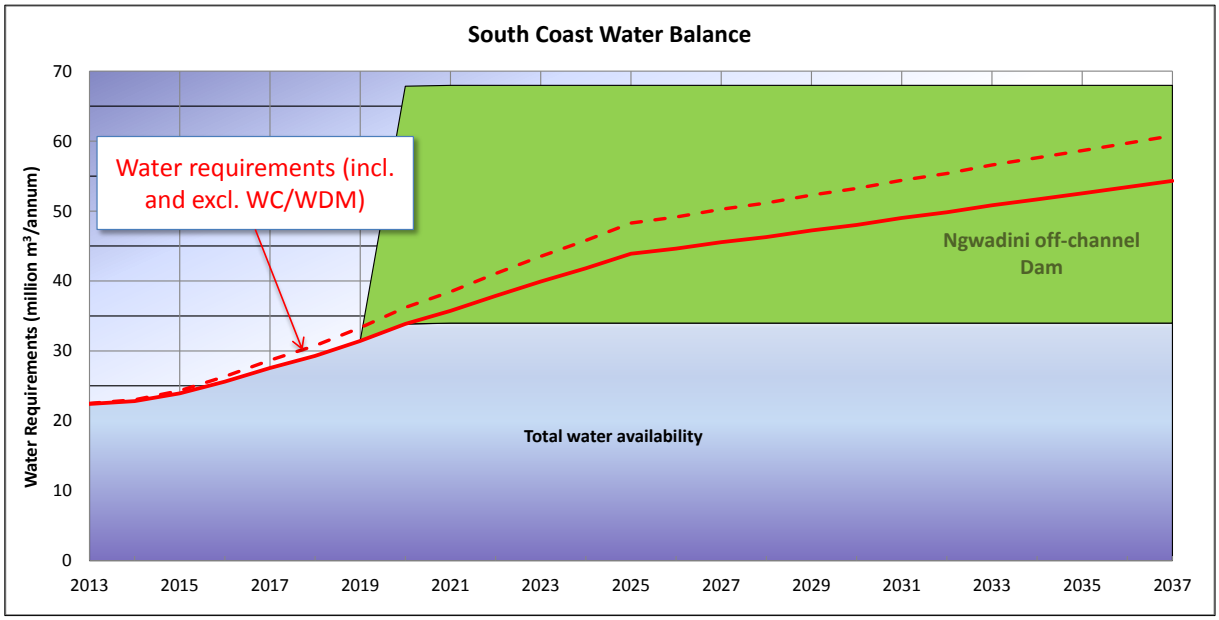

Figure 4.2: Water balance for South Coast system, with support from Mgeni WSS

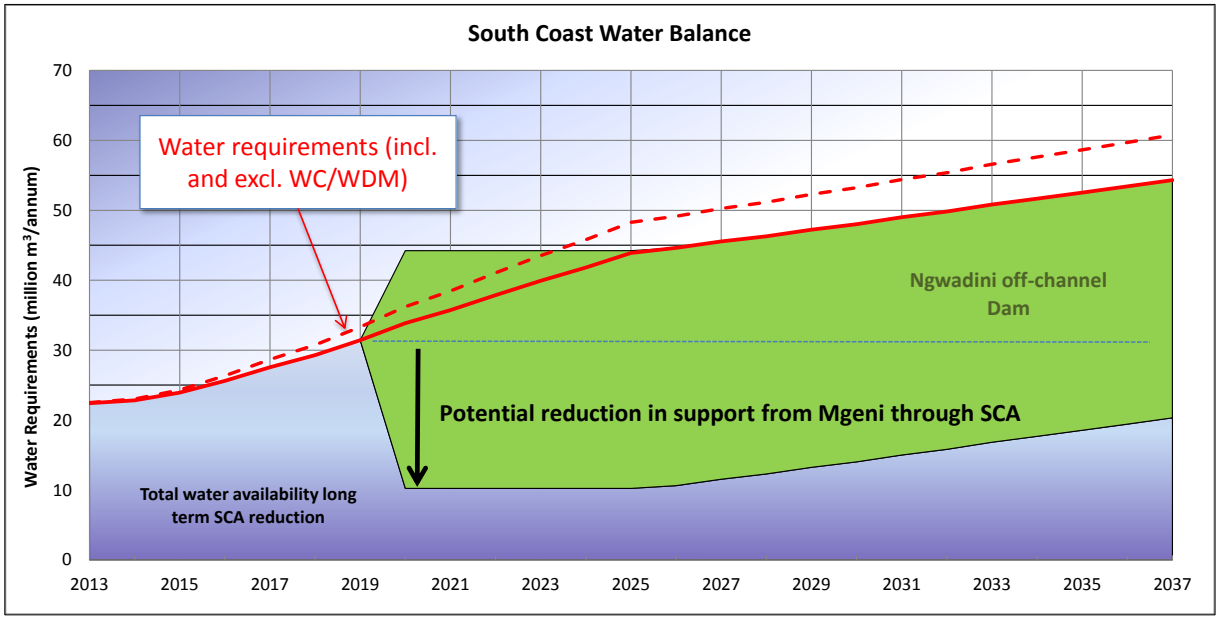

Figure 4.3: Water balance for South Coast system, with potential reduction in support from Mgeni WSS

The figures further show that a positive water balance can be maintained in the South Coast system provided that:

- WC/WDM initiatives are implemented and are successful in achieving the reduction in projected water requirements as shown.
- The South Coast system is augmented by 2019 through a new scheme such as Ngwadini Dam or desalination.

4.3 MGENI SYSTEM

The updated intervention list discussed in Section 7 highlights a number of possible options for the implementation augmentation schemes and, as such, five reconciliation scenarios were identified to capture the impacts on the water balance of the Mgeni WSS. A summary of these scenarios is provided below:

- Scenario A1: Re-use of effluent water, followed by uMWP1.
- Scenario A2: Delayed implementation of re-use, followed by uMWP1.
- Scenario B: Desalination of sea water on the North Coast, followed by uMWP1.
- Scenario C: Re-use of effluent water, followed by desalination of sea water on the North Coast and then uMWP1.
- Scenario D: uMWP1 only.

The resulting water balances are presented in Figure 4.4 to Figure 4.8, respectively, and the results are discussed thereafter. Note that all water balances include:

- The recently commissioned Spring Grove Dam, the second phase of the Mooi-Mgeni Transfer Scheme (MMTS2) (shown in dark blue).
- The benefit for the Mgeni WSS water balance if the support currently provided to the South Coast through the SCA is reduced once the South Coast is augmented by a new scheme in 2019 (shown in yellow). More information in this regard is provided earlier in Section 4.2.

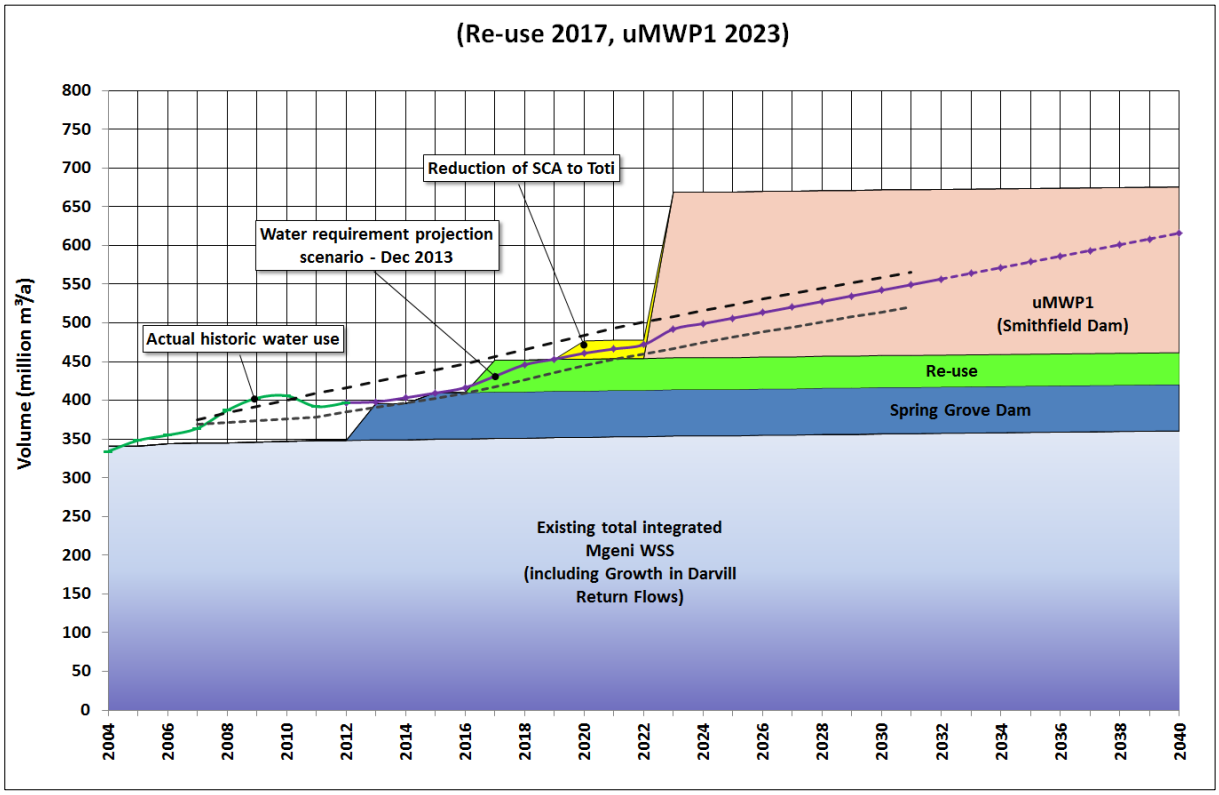

Figure 4.4: Water balance for Mgeni WSS (Scenario A1: Reuse & uMWP1)

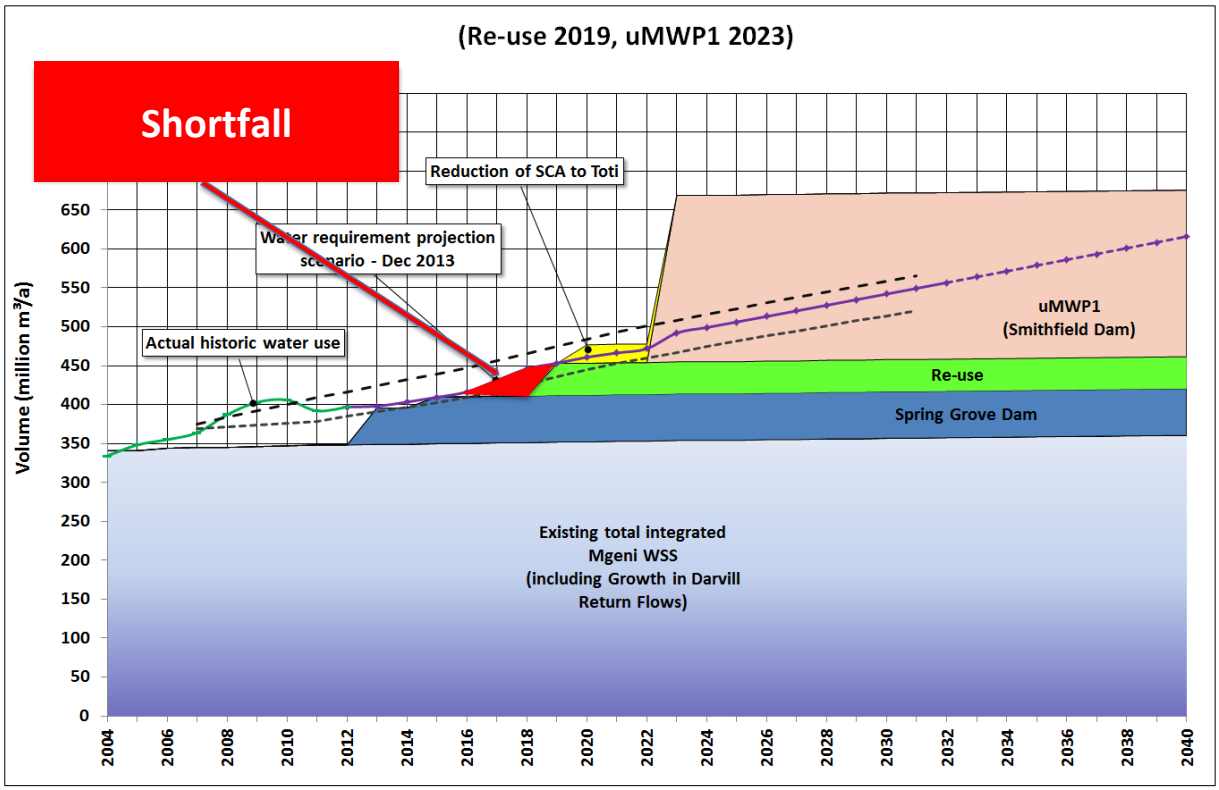

Figure 4.5: Water balance for Mgeni WSS (Scenario A2: Delayed Reuse & uMWP1)

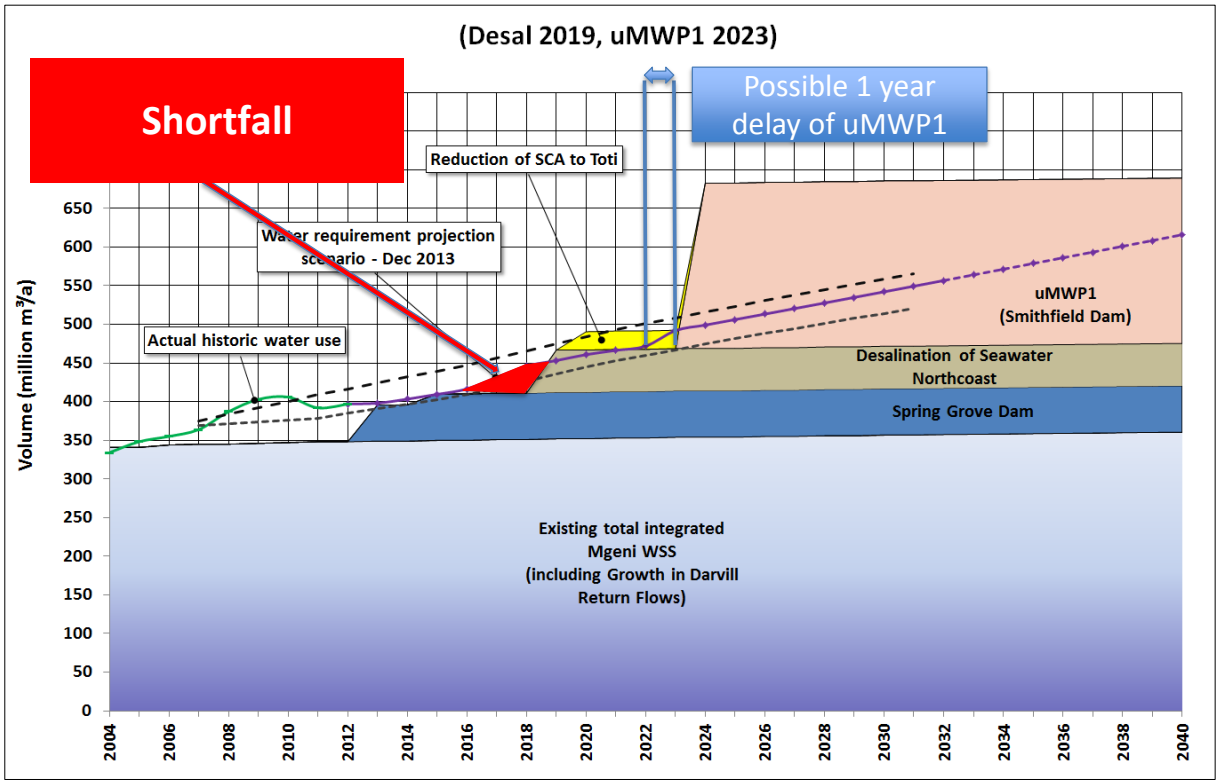

Figure 4.6: Water balance for Mgeni WSS (Scenario B: Desalination & uMWP1)

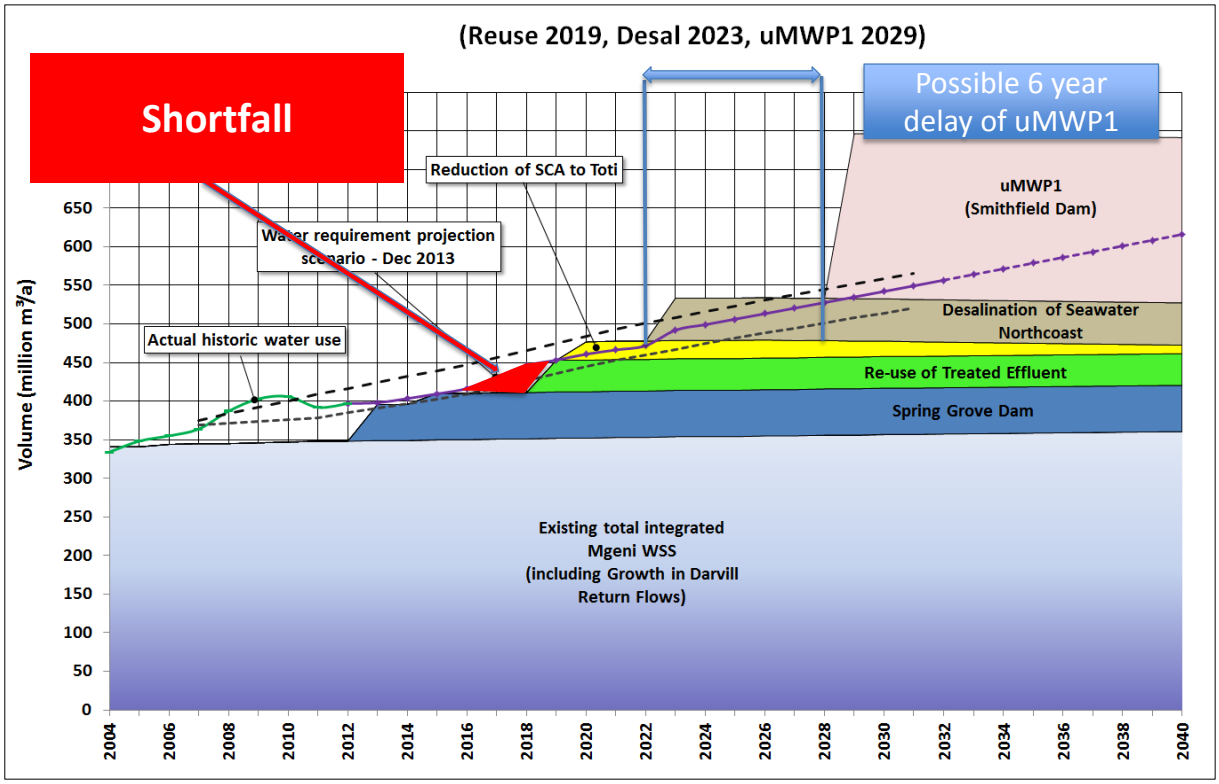

Figure 4.7: Water balance for Mgeni WSS (Scenario C: Reuse, Desalination & uMWP1)

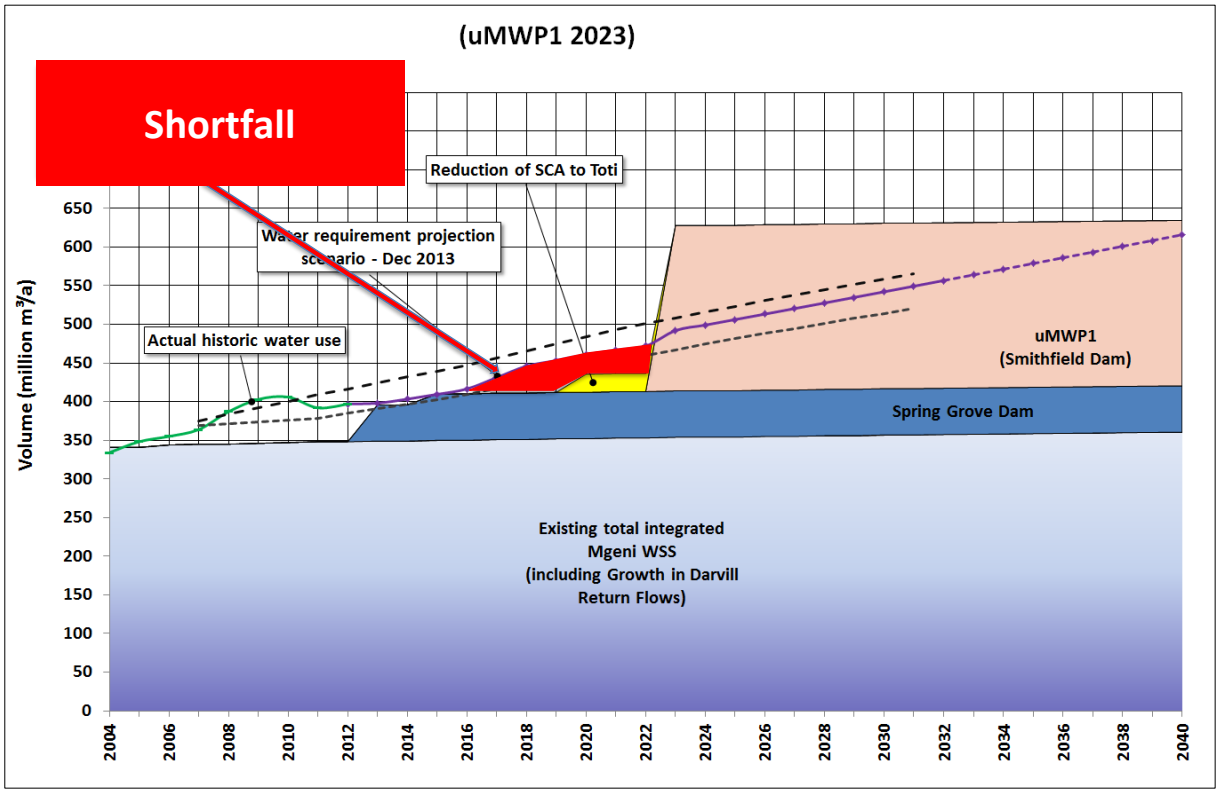

Figure 4.8: Water balance for Mgeni WSS for Scenario D (uMWP1 only)

Based on the water balances for the five 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.
- If the proposed re-use of effluent water is implemented in eThekwini MM by 2017 a positive water balance can be maintained, provided that pressure on the Mgeni WSS is relieved by reducing support to the South Coast through the SCA once the South Coast is augmented by a new scheme in 2019 (as shown in **Figure 4.4**).
- Since the implementation of re-use by 2017 is improbable due to the current social perceptions and associated concern by eThekwini MM, a short-term shortfall situation will occur between 2016 and 2019 (as shown in **Figure 4.5**).
- Similarly, if the desalination of seawater is implemented on the North Coast by 2019, a short-term shortfall situation will occur between 2016 and 2019 (as shown in **Figure 4.6**)
- If re-use in eThekwini MM and desalination of sea water on the North Coast are both implemented by 2019, the uMWP1 scheme (Smithfield Dam) can be delayed, but only by six years from 2023 (the earliest realistic commissioning date) to 2029 (as shown in **Figure 4.7**).

- If uMWP1 is implemented without the re-use and desalination options, a longer shortfall period seven years is projected from 2016 to 2023 (as shown **Figure 4.8**). It is interesting to note that the projected shortfall period will be similar in length and magnitude to that which was experienced in the Mgeni WSS over the period preceding the commissioning of Spring Grove Dam. However, as discussed earlier in **Section 2**, the region was fortunate to experience good rainfall during that period but there is no guarantee that this will be the case over the projected shortfall period.

5 IMPLEMENTATION OF RECONCILIATION STRATEGY

5.1 WATER BALANCES

Based on the water balances for the Mdloti and Mvoti, South Coast and Mgeni systems discussed in **Section 4** a number of key observations and associated activities were identified for the Reconciliation Strategy and these are summarised below:

- A positive water balance can be maintained in the South Coast system, provided that WC/WDM initiatives are successfully implemented and the system is augmented by 2019 through a new scheme such as the Ngwadini off-channel storage dam or the desalination of sea water. This scheme will have the further benefit of relieving pressure on the Mgeni WSS over the short-term by reducing the need for support to the South Coast through the SCA. It is therefore recommended that a decision on the preferred augmentation option for the South Coast system is made as a matter of urgency to allow for the implementation of the scheme to proceed without delay and commissioning to take place by 2019.
- The implementation of either reuse in eThekwini MM or the desalination of seawater on the North Coast successfully achieves a reduction in both the duration and magnitude of the projected shortfall in the Mgeni WSS after 2016. However, even if both the re-use and desalination options are implemented this does not significantly delay the need for implementing the uMWP1 scheme. It is therefore recommended that the potential cost saving of not implementing reuse or desalination is compared to the associated risk for the Mgeni WSS of (i) the resulting projected period and magnitude of shortfall; and (ii) the possibility and likelihood that the uMWP1 would not be commissioned by 2023.
- In order to meaningfully assess the above options it is further recommended that a number of scenarios are defined based on the possible timing and sequencing of augmentation schemes. The cumulative, discounted costs associated with each scenario can then be calculated for comparison purposes, based on both (i) capital and operation infrastructure costs; and (ii) the possible economic impacts of reduced assurance of supply characteristics projected under each scenario.

- Finally, it is recommended that the mechanism of decision making and implementation of uMWP1 is reviewed and improved to avoid the delays experienced with MMTS2, particularly with the finalisation of off-take agreements and acceptance of tariff impacts.

5.2 WC/WDM

Water conservation and water demand management (WC/WDM) has been a key aspect of the Reconciliation Strategy and an important intervention for dealing with short-term water supply challenges. This continues to be the reality and without ongoing WC/WDM initiatives the situation will become unmanageable from a water balance perspective. Due to the interconnectedness of the KZN Coast Metropolitan Area, a failure by any of the WSAs to implement and maintain appropriate WC/WDM initiatives will have a significant impact on all users.

eThekwini MM presented at the SSC meeting and summarised challenges and success with implementing WC/WDM. It was noted that:

- WC/WDM is not only a series of technical interventions, but is also impacted upon by social perceptions and behaviours, to the point of determining the success of WC/WDM initiatives.
- While the total supply of water in eThekwini MM continues to grow, the revenue from sales has remained relatively static over the past 10 years.
- At future SSC meetings, all WSAs in the supply areas will be required to provide feedback on WC/WDM implementation.

5.3 MOOI-MGENI TRANSFER SCHEME

The Mooi-Mgeni Transfer Scheme (MMTS) was developed to augment water supply to the Mgeni WSS that has been in a shortfall situation since around 2005. The scheme comprises of Mearns Weir and 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).

The Trans-Caledon Transfer Authority (TCTA) was instructed to implement the scheme on behalf of the Department and Spring Grove Dam (Phase 2A) was completed and handed over to the Department on 3 March 2014. Furthermore, the first 3.7 km of the 14.7 km Phase 2B pipeline has been laid by the contractor

and another working front has also been opened on the project to prevent delays. However, it has been noted that Eskom faces some challenges that could result in delays in the provision of electricity to scheme.

5.4 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. Furthermore, sediment deposition in Hazelmere Dam over the last two decades has caused a decrease in its live storage capacity, and therefore also the yield of the dam.

5.4.1 Raising of Hazelmere Dam

The raising of Hazelmere Dam 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. Geotechnical issues related to the stability of the dam wall resulted in delays, but the contract for detailed design was awarded in 2013.

The start of construction is imminent, with DWS Infrastructure Branch currently evaluating construction tenders for award during September 2014. Construction will take place over a 24 month period. However, if an Environmental Impact Assessment (EIA) is required for the disposal of materials (in case it cannot be placed in the dam basin) this could cause further delays.

5.4.2 North Coast Pipeline and Hazelmere Supply Infrastructure

The extensive current and proposed future developments within the North Coast area have also necessitated the extension and upgrade of infrastructure to support the entire North Coast WSS. This will be achieved through the following projects:

- A new raw water pipeline from Hazelmere Dam to the Hazelmere water treatment works (WTW) and the upgrade of the Hazelmere WTW from 45Mℓ/d to 75Mℓ/d. The anticipated completion date is November 2014.
- The construction of a pump station at the WTW, planned for completion in September 2014.
- The recently upgraded Hazelmere to La Mercy bifurcation pipeline.

- A pipeline to augment the North Coast WSS from the Honolulu Reservoir to the Mvoti Balancing Reservoirs, which is currently under construction.

5.4.3 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 will involve the abstraction of water from the lower Thukela River (near the SAPPI mill) and treatment at a regional WTW. The detail design of the LTBWSS has been completed and Phase 1 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 implemented in 2016.

5.5 uMKHOMAZI WATER PROJECT

One of the augmentation options identified to meet the long-term water requirements for the Mgeni System is the uMkhomazi Water Project (uMWP). The first phase of the 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, and gravity potable water pipeline connecting the uMWP to the Umgeni Water bulk distribution network. It is anticipated that, optimistically, the project can be implemented by 2023. Phase two will be implemented when needed, including a second large dam on the uMkhomazi River at Impendle.

The uMWP Feasibility Studies, including the raw water and potable water components of the scheme, should be completed by November 2014 and will provide the project layout and size of infrastructure components. The EIA scoping phase has recently been completed and the aim is to obtain environmental authorisation by November 2015.

DWS and Umgeni Water will be the owners of the raw and potable water components, respectively.

5.6 DIRECT REUSE OF TREATED WASTEWATER

The direct reuse of treated wastewater is an attractive intervention option. It not only improves the sustainability of water resources but also provides the strategic advantage of improving the security of supply through the diversification of water resource utilisation. Furthermore, wastewater is available throughout the year and the supply is consistent.

In early 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 waste water treatment works (WWTW) is reclaimed and treated to potable standard for reticulation. However, public disapproval 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.

5.7 DESALINATION OF SEA WATER

Umgeni Water is investigating the option of desalination as an alternative water supply source. A feasibility study is currently underway to investigate two 150 Mℓ/d plants, located at Lovu on the South Coast and Tonga at on the North Coast. The capacity of these plants is based on the capacity of existing and proposed bulk water supply infrastructure in these areas, which will be utilised to convey the potable water from the plants to the various distribution points. Current cost estimates show that the total cost of infrastructure is R2 800 million and annual O&M costs add up to R295 million/a. The feasibility study is expected to be completed by December 2014.

However, it is noted that initial result indicate the Tongaat plant on the North Coast may not feasible in the short- to medium-term and the feasibility of the Lovu plant depends on an economic comparison with the other proposed scheme for the South Coast, namely the Ngwadini off-channel storage dam in the Lower uMkhomazi River catchment (discussed below).

5.8 LOWER UMKHOMAZI BWSS

The high growth in water requirements experienced in the Upper and Middle South Coast areas (i.e. from Amanzimtoti to the uMkhomazi River and from the uMkhomazi to the Mtwalume rivers, respectively) requires the development of

additional water resources. The Lower uMkhomazi Bulk Water Supply Scheme (BWSS) was identified by industrial water user SAPPI-SAICCOR and consists of an abstraction works on the uMkhomazi River, an off-channel storage dam at Ngwadini (on a tributary of the lower uMkhomazi River), a 100Mℓ/d WTW, pump station and pipeline to deliver water to the South Coast supply area. The scheme will relieve reliance of the South Coast on the already stressed Mgeni WSS.

A detailed feasibility study by Umgeni Water has recently commenced, focusing on the WTW, pump station, access roads and bulk supply infrastructure required for the proposed scheme, while a detailed design of the dam has already been undertaken by SAPPI. Although the scheme is currently being pursued by Umgeni Water as a source of domestic water, SAPPI may still consider some level of involvement in its development as it will improve the assurance of supply to their SAICCOR plant over the dry season.

5.9 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 three-year study timeline has, however, been revised with a planned commencement date of April 2015. If found to be feasible, detailed design of the scheme may be undertaken over the period August 2018 to July 2020 and construction from 2020 to 2023. First water delivery is currently estimated at April 2024.

5.10 MANAGEMENT OF SYSTEM OPERATION

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 very short-term water supply situation is not at risk but that the situation would have to be monitored carefully. In this regard the following were noted:

- Late rainfall during the last season has maintained the water volumes in major dams of the Mgeni WSS at high levels and averted the need for imposing water restrictions in the short-term.

- There was no immediate need for concern in either the Mgeni or Mdloti and Mvoti systems assuming that pumping from Inanda and abstractions from Hazelmere Dam are maintained at the appropriate levels.
- Major concerns were, however, expressed over the South Coast system, in particular the area supplied from the Umzinto WTW, with only intermittent support available from the Mgeni WSS the SCA.
- The combined storage volume of EJ Smith and Umzinto dams, as at May 2014, was only 66% and highlights the need for reduced water abstractions.

Recommendations made at the SOF are summarised below.

a) South Coast WSS

- Mandatory restrictions of 33% must be implemented for supply from EJ Smith and Umzinto dams.
- Planned projects for augmentation of the Umzinto system must be fast tracked. These are:
    - Singh's Reservoir off-take link.
    - Optimisation of the Willowglen Pump Station.
    - Phase 2 of the Scottburgh to Ellingham link.
- Ugu DM must focus on reducing leaks in their reticulation systems.
- Support must be provided to Ugu DM in the implementation of water restrictions, including public awareness.
- An SOF meeting should be held in August 2014 to review the water resource status and effectiveness of restrictions.

b) Mgeni WSS

- Pump from the Mooi River, probably as soon as October 2014, after refurbishments of the Mearns pumps and Mpofana outfall are completed.
- Maintain pumping from Inanda Dam at 200 Mℓ/d.

The progress made on the above recommendations since the SOF was reported on at SSC Meeting No. 6 and this is summarised below:

- Abstraction from EJ Smith and Umzinto dams appears to have been reduced by 42%, resulting in the slower decline in dam levels.

- Planned projects for augmentation of the Umzinto system are being fast-tracked, but this does not alleviate the need for restrictions.
- The behaviour of the system and level of abstractions are being monitored continuously.

6 UPDATE OF RECONCILIATION STRATEGY

A number of new initiatives and augmentation options have been identified since the previous SSC meeting and it was recommended at SSC Meeting No. 6 that these are included in the Strategy going forward. A short discussion of each is provided in the following subsections.

6.1 THUKELA WATER PROJECT DESKTOP STUDY

The Thukela Water Project (TWP) is a major proposed water resources development located in the upper Thukela River catchment. The main elements of the scheme are:

- Jana Dam on the Thukela River situated approximately 30 km south-west of Ladysmith and 15 km downstream of the confluence of the Thukela and Klip rivers.
- Mielietuin Dam in the Bushmans River, situated between Weenen and Estcourt and immediately upstream of the western boundary of the Weenen Nature Reserve.
- A 120 km pipeline linking the proposed dams to the existing Kilburn Dam at the bottom of the Drakensberg Pumped Storage Scheme.

Although the TWP has been planned as an augmentation scheme for Integrated Vaal River System, the option has been proposed of fast-tracking a selected component of the project as a regional water supply option in KZN. In particular, the project could augment available water supply in the lower Thukela River (and therefore the KZN Coast Metropolitan area) in the medium-term.

The original feasibility study for the TWP was completed in 2001. However based on comparative studies to augment the Vaal System the decision was subsequently taken in favour of the Lesotho Highlands Phase 2 scheme, which means that the TWP will only be needed for that purpose in the distant future.

6.2 CATCHMENT CARE

The *uMngeni Ecological Infrastructure Partnership* (UEIP) is a committee dedicated to maintaining and investing in ecological infrastructure as a means to contribute to water security. This partnership, headed by the South African

National Biodiversity Institute (SANBI), focusses on the following catchment care initiatives:

- Clearing invasive alien plants, especially in mountain catchments and riparian areas.
- The rehabilitation of wetlands.
- Maintaining buffers of natural vegetation along streams and rivers.
- Monitoring compliance with effluent standards for agriculture and industry.
- Improving rangeland management practices, such as grazing regimes and fire management.

The SSC recognises the need to maintain the ecological services that provide and maintain the supply of water resources from all catchments within the KZN Coast Metropolitan Area. As such, the SSC has undertaken to support communication and collaboration between the Strategy and the UEIP.

6.3 THE NATIONAL WATER RESOURCES STRATEGY

As the Reconciliation Strategy of the KZN Coast Metropolitan Area falls within the *National Water Resources Strategy 2* (NWRS2), the status and progress of the NWRS2 was mentioned by the Chair of the SSC Meeting No. 6. It was noted that the revision of NWRS2 has been approved by Cabinet and its implementation is underway. The development and continuation of Reconciliation Strategies is therefore critically important for achieving one of the major objectives of NWRS2, which is to achieve economic, social, and environmental goals sustainably.

An important commitment made in NWRS2 is that the DWS will continue, in partnership with stakeholders, to development of Reconciliation Strategies for balancing water supply and water requirements into the future. Many of the initiatives undertaken in the maintenance of the Reconciliation Strategy of KZN Coast Metropolitan Area align with the key priority areas of the NWRS2 and this focused will be maintained.

7 IMPLEMENTATION 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 previous sections of the report). Target dates for intervention options have been revised since the previous SSC meeting held in September 2012 and the updated list is provided in **Appendix A**.

More information on the Strategy can be found at the following link: http://www.dwa.gov.za/Projects/KZN%20Recon/

The DWS Project Manager for the Strategy is Mr Niel van Wyk and he can be contacted on:

- Tel: 012 336 8327
- Email: vanwykn@dwa.gov.za

8 REFERENCES

DWA, 2009. *Water Reconciliation Strategy for the KwaZulu-Natal Coastal Metropolitan Areas: Executive Summary,* Pretoria, South Africa: Department of Water Affairs, Directorate: National Water Resource Planning.

DWA, 2012. *KwaZulu-Natal Coastal Metropolitan Area Water Supply System Strategy Steering Committee (SSC) for the Implementation and Maintenance of the Reconciliation Strategy Meeting 5: Progress Report,* Pretoria, South Africa: Department of Water Affairs, Directorate: National Water Resource Planning.

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		Dec-14	Refurbishment of MMTS1 valves and manhole complete
Upgrade Mearns pump station and pipeline (3.2 m^3/s)	In progress	Dec-15	
Mooi-Mgeni Transfer Scheme Phase 2B (DWS/TCTA)			
Pipeline and pump station			
Detailed design	Jan-12	Apr - 14	
Construction	Oct-14	Apr -15	
Delivery via MMTS2B (1.8 m^3/s)		Jul-15	
Hazelmere Dam Raising (DWS)			
Design of civil works	Oct-11		
Contract for gates	Nov-12	Nov-12	
Preliminary design work and geotechnical investigation to confirm best raising option	Feb-12	Oct-14	
Decision to continue with raising of dam as an option	Nov-14	Apr-15	Need confirmation of decision from DWS (K Bester)
Finalise design/tenders	May-15	Aug-15	
Construction	Sep-15	Jul-17	
Delivery		Nov-17	Estimated completion between 2018 and 2019 (K Bester)
uMkhomazi Water Project Phase 1 (DWS)			
Feasibility Study (Raw Water)	Oct-11	Dec-14	EIA scoping completed, go ahead with EIA
Feasibility Study (Potable Water)	Aug-12	Jul-14	
Feasibility Study EIA	Nov-12	Nov-15	
Decision to proceed with uMWP1 and offtake agreements	Dec-15	Dec-16	
Detailed design	Jan-17	Dec-18	
Construction	Jan-19	Dec-22	
Delivery		Apr-23	

Main scheme	Start date	End date	Comment/s
Mvoti River Scheme (DWS)			
Feasibility Study	Apr-15	Apr-18	Estimated start date (timeline moved)
EIA (including estuary)	Jun-15	Apr-18	
Detailed design	Aug-18	Jul-20	
Construction	Oct-20	Oct-23	
Delivery		Apr-24	
Lower Thukela Bulk Water Supply Scheme (Umgeni Water)			
Feasibility Study		Jul-11	
Detailed design	Aug-11	May-12	
Construction	Jul-12	Dec-15	Underway
Delivery		Jan-16	1st phase 55 Mℓ/d, total 110Mℓ/d
North Coast Pipeline and Hazelmere Supply Infrastructure (Umgeni Water)			
Construction pipeline from Avondale to Honolulu reservoir		Nov-11	Completed
Construction pipeline from Honolulu to Mvoti balancing reservoir		Oct-10	Completed
Construction pipeline from Honolulu to Mvoti pump station		Jun-14	Pump station to Ballito experienced delays
Construction bifurcation pipeline from Hazelmere to La Mercy	Feb-12	Nov-13	Completed
Construction raw water pipeline from Hazelmere to Hazelmere WTW		Mar-13	Completed
Upgrade Hazelmere WTW		Jun-14	Completion before 2014 holiday season
Desalination of sea water (Umgeni Water)			
Site selection	Mar-11	Dec-12	Completed
Feasibility Study	Jan-12	Jun-14	
Delivery		Jan-19	
Direct reuse of treated wastewater (eThekwini MM)			
PSP appointed for Mgeni Estuary Reserve		Mar-11	
Results of Mgeni Estuary workshop		Sep-11	
EIA process and approval	Nov-11	Nov-12	
Tender preparation and adjudication	Jan-15	Jun-15	
Tender award, financing and site establishment	Jun-15	Jun-16	
Construction and commissioning	Jul-16	Jul-18	
Delivery		Jul-18	
Lower uMkhomazi Bulk Water Supply Scheme (Umgeni Water)			
Feasibility Study	Jul-14	Dec-15	
EIA (including estuary)	Aug-14	Dec-15	
Detailed design	Apr-16	Apr-17	
Construction	May-17	Jan-20	
Delivery		Jan-20	