

Reconciliation Scenarios

- Scenario I:
 - WC/DM Waste management over 5 years.
 - Utilising Thukela Transfer Scheme to support KwaDukuza & Mdloti System
 - Raise Hazelmere Dam
 - Incorporate Water Reuse
 - Incorporate MMTS Phase 2 and Mkomazi Transfer Scheme
- Scenario II:
 - WC/DM waste management over 5 years.
 - Mvoti development to support KwaDukuza. & Mdloti System
 - Raise Hazelmere Dam
 - Incorporate Water Reuse
 - MMTS Phase 2 and Mkomazi Transfer Scheme

Reconciliation Scenarios

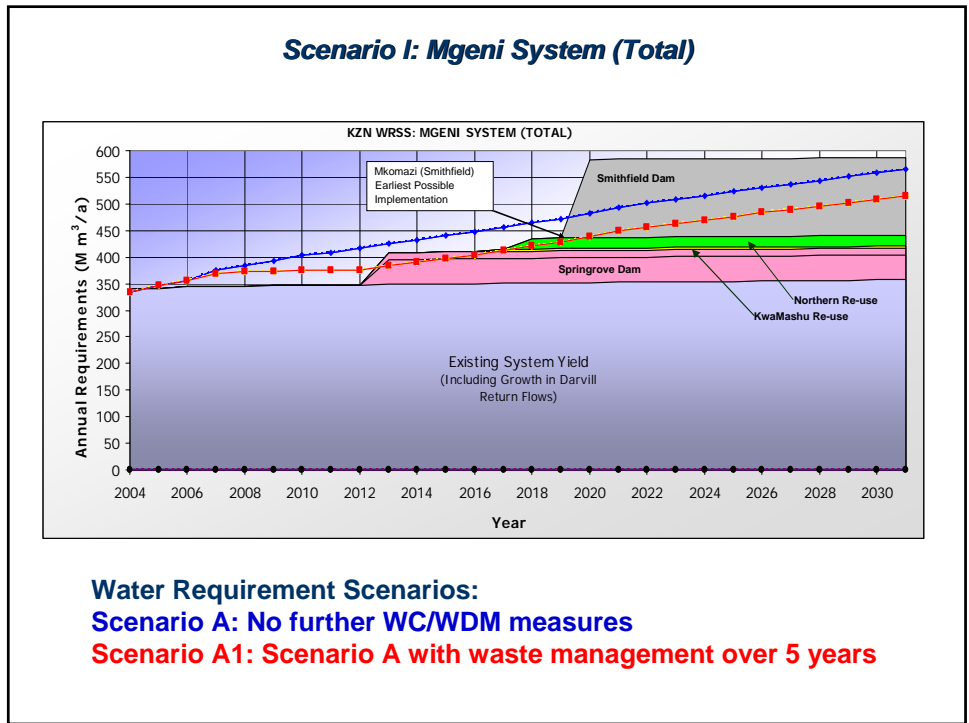
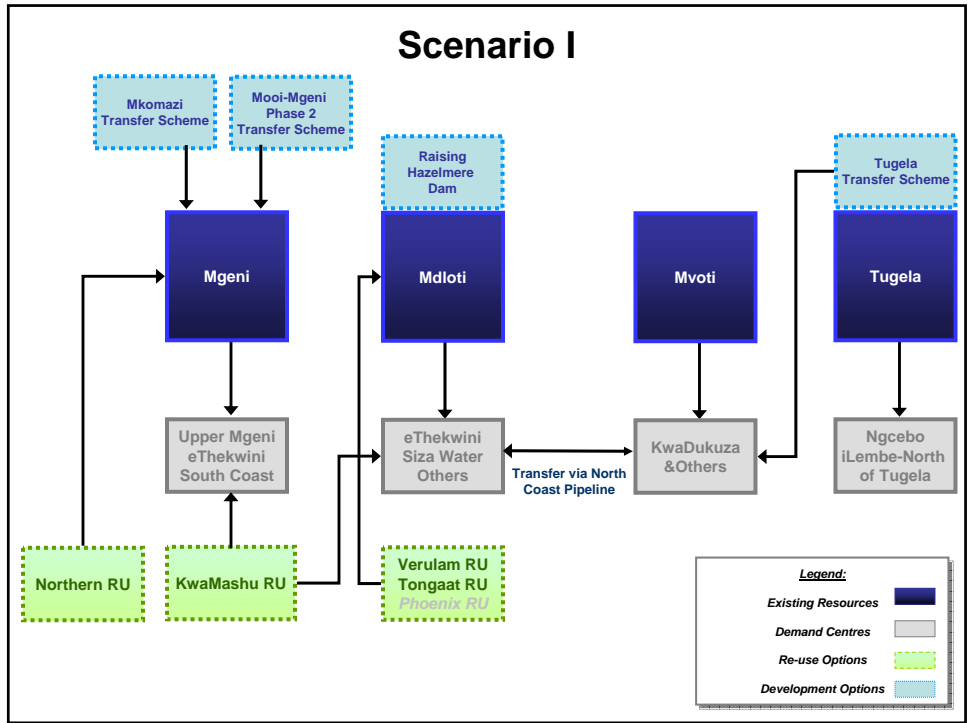
- Scenario III:
 - WC/DM waste management and improve efficiency
 - Schedule augmentation interventions according to water balance
- Scenario IV (Detailed Scenario-Test):
 - Similar to Scenario I:
 - Treated wastewater from Verulam and Tongaat WWTP used to supply the estuarine water requirements for the Mdloti and Tongati Rivers (Further investigations is necessary to confirm EWR and water balance)

Reconciliation Scenarios

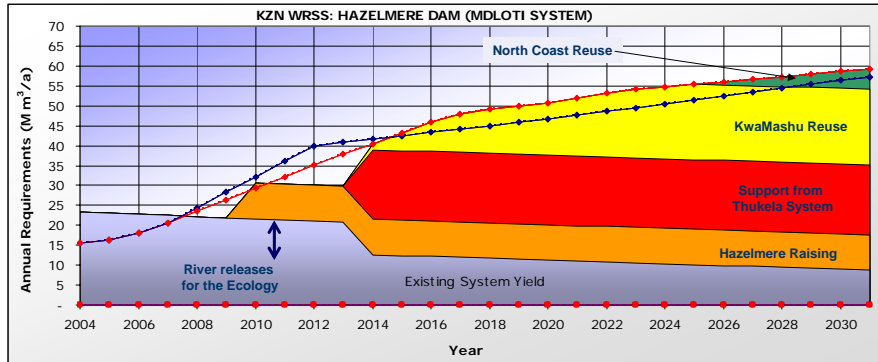
- **Scenario V:**
 - Similar to Scenario 1
 - Incorporate return flow growth for water reuse options
 - Incorporate additional water reuse (Umhlanga & Amamzintoti WWTP)
- **Scenario VI:**
 - Similar to Scenario I:
 - Exclude water reuse

Reconciliation Scenario I

- WC/DM waste management over five years.
- Thukela Transfer Scheme to support KwaDukuza & Mdloti System
- Raise Hazelmere Dam
- Water Reuse
- MMTS Phase 2 and Mkomazi Transfer schemes
- Partial utilisation of the Thukela excess

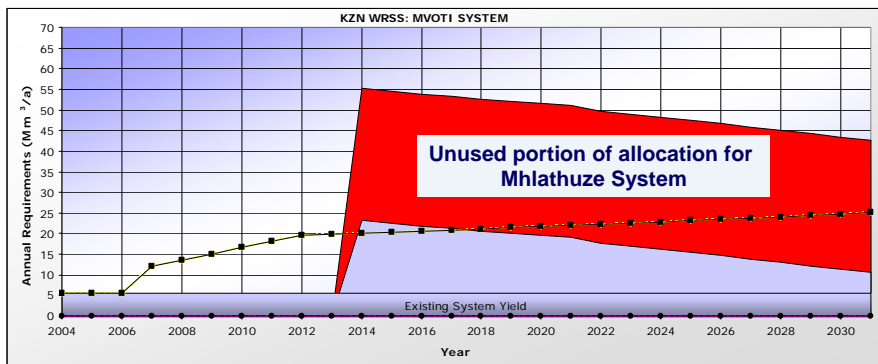


Scenario I: Mdloti System (Hazelmere)

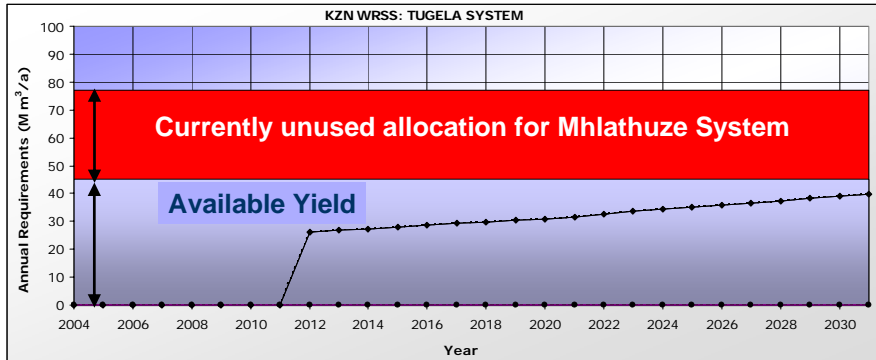


Water Requirement Scenarios:
Scenario M-A: Ethekwini Scenario A + Illembe Master Plan
Scenario M-B: Umgeni Water Scenario, excluding pending and conceptual planned developments

Scenario I: Mvoti System

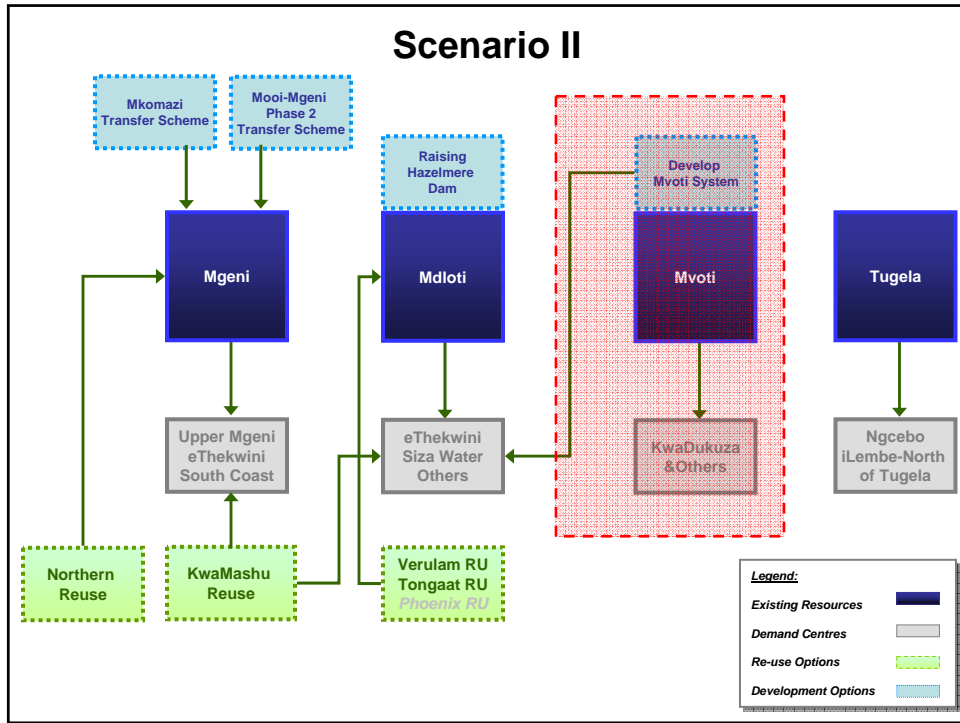


Scenario I: Tugela System

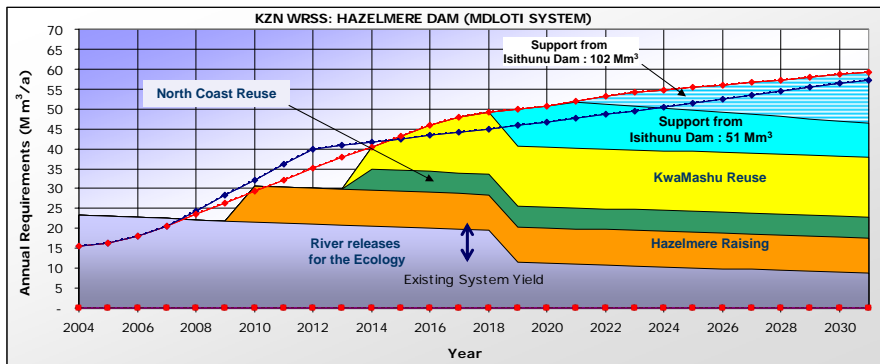


Reconciliation Scenarios

- Projected yield balances, current system yield capability.
- Scenario I:
 - WC/DM Waste management over 5 years.
 - Fully utilise Thukela Transfer Scheme to support KwaDukuza & Mdloti System
 - Raise Hazelmere Dam
 - Water Reuse
 - MMTS Phase 2 and Mkomazi Transfer Scheme
- Scenario II:
 - WC/DM Waste management over 5 years.
 - **Mvoti River development to support KwaDukuza & Mdloti System.**
 - **Raise Hazelmere Dam**
 - Incorporate Water Reuse
 - MMTS Phase 2 and Mkomazi Transfer Scheme



Scenario II: Mdloti System (Mvoti+KwaMashu Support)

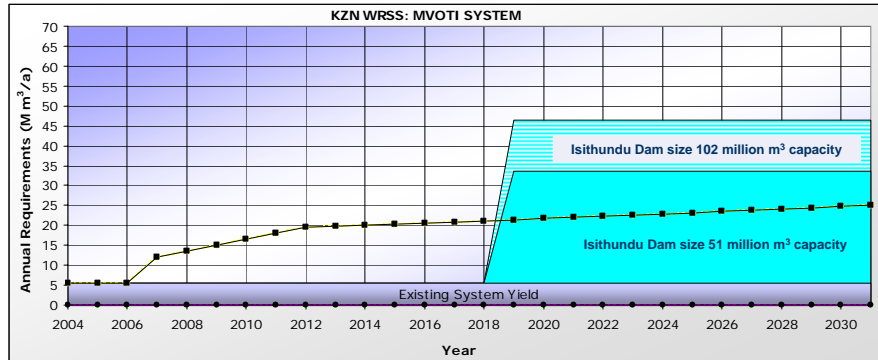


Water Requirement Scenarios:

Scenario M-A: Ethekwin Scenario A + Ilembe Master Plan

Scenario M-B: Umgeni Water Scenario, excluding pending and conceptual planned developments

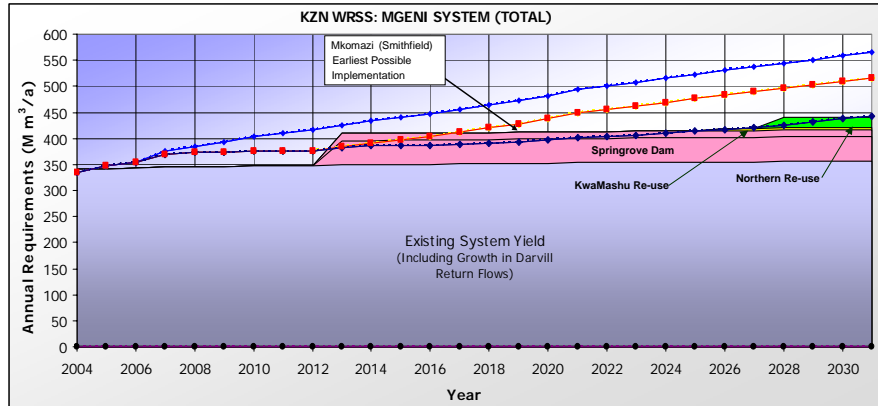
Scenario II: Mvoti System



Mgeni System Water Balance (Reconciliation Scenario III)

- WC/WDM, Scenario A2, waste management over five year period and improve efficiency.
- Augmentation from the Thukela System.

SCENARIO III: Mgeni System (Total)



Water Requirement Scenarios:

Scenario A: No further WC/WDM measures

Scenario A1: Scenario A with waste management over 5 years

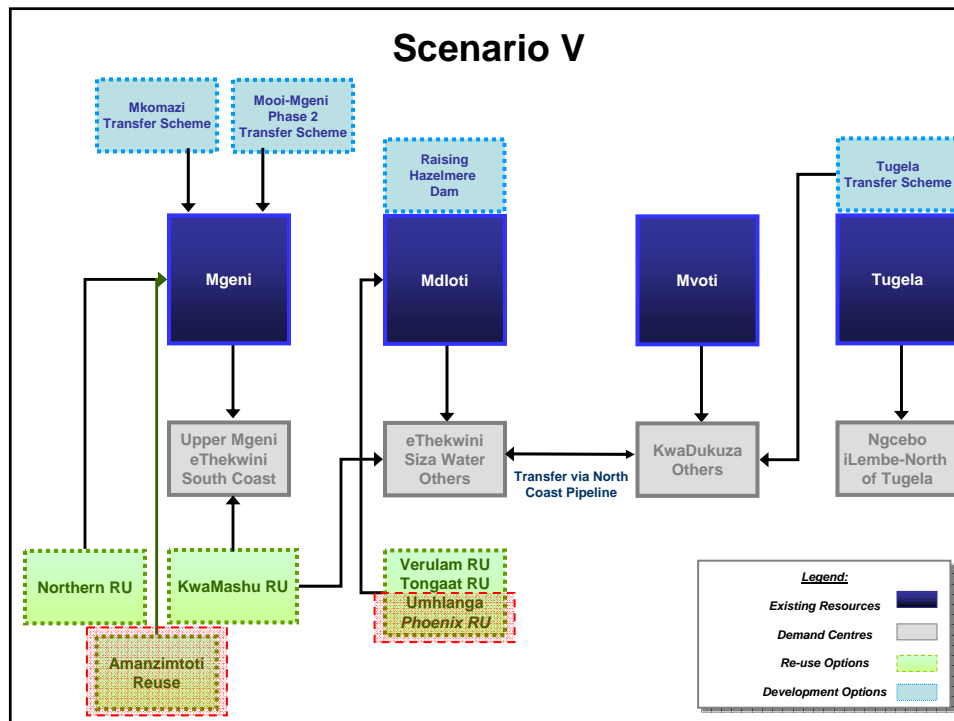
Scenario A2: Scenario A with waste management over 5 years and efficiency

Reconciliation Scenario IV

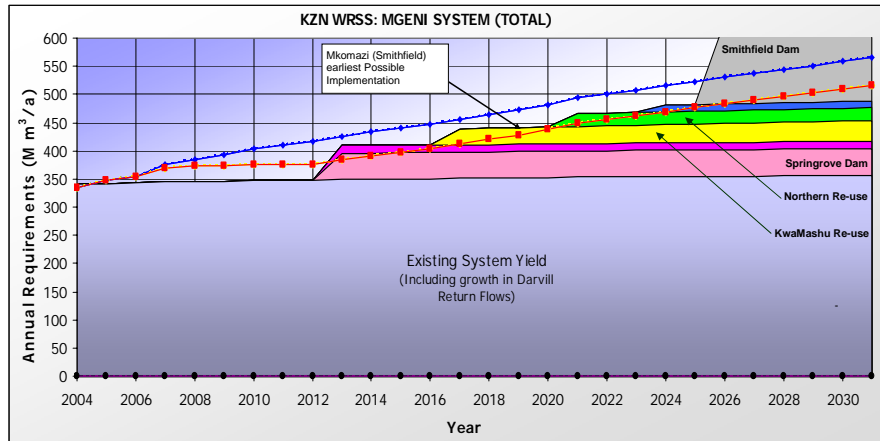
- No results presented – detailed scenario for testing purposes

Reconciliation Scenario V

- Similar to Scenario I
- Incorporate return flow growth for water reuse options
- Incorporate additional water reuse (Umhlanga & Amamzintoti WWTP)



Scenario V: Mgeni System (Total)



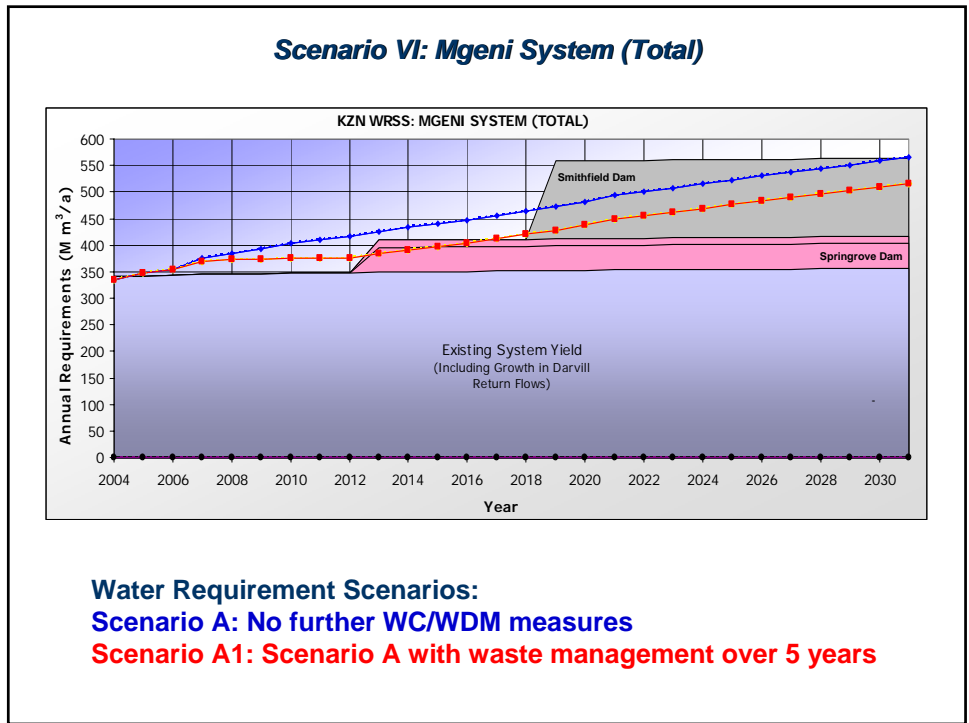
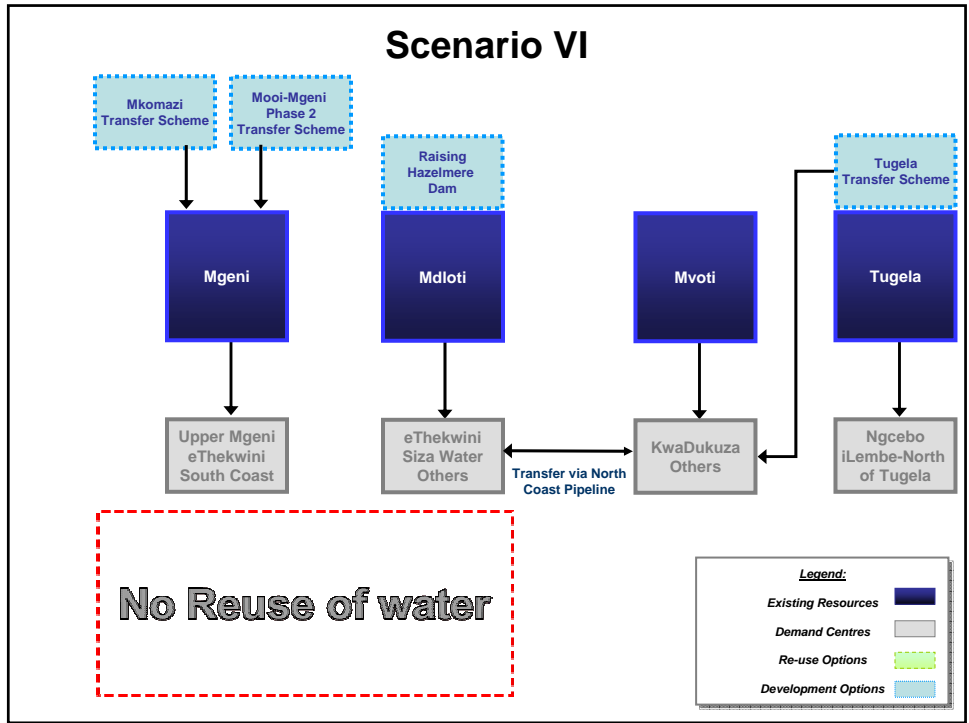
Water Requirement Scenarios:

Scenario A: No further WC/WDM measures

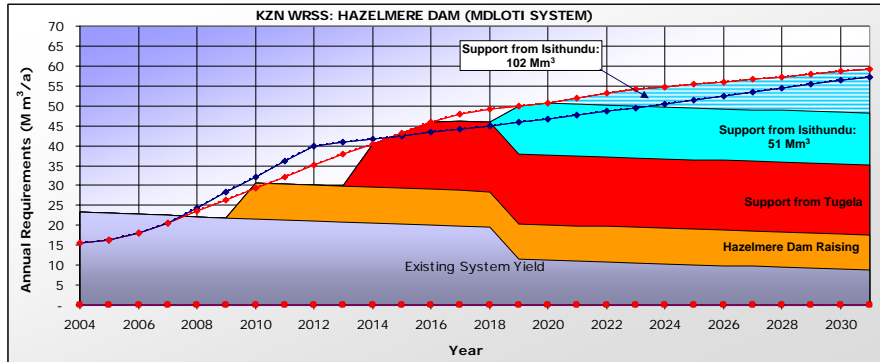
Scenario A1: Scenario A with waste management over 5 years

Reconciliation Scenario VI

- Similar to Scenario I
- Exclude water reuse



Scenario VI: Mdloti System (Hazelmere)

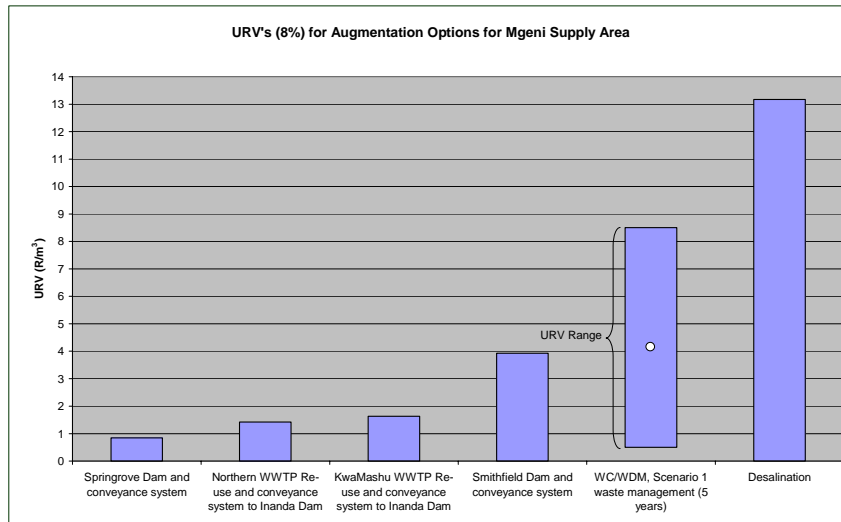


Water Requirement Scenarios:

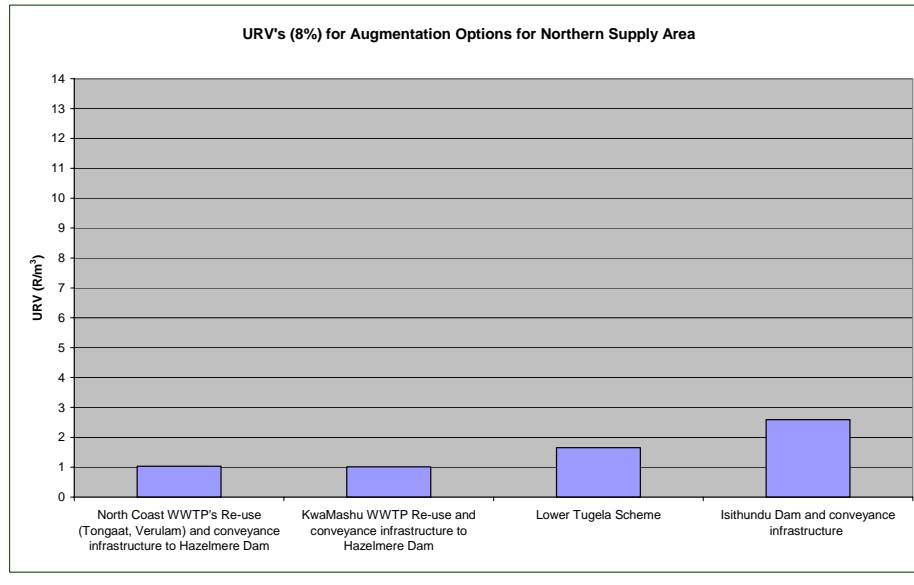
Scenario M-A: Ethekwini Scenario A + Illembe Master Plan

Scenario M-B: Umgeni Water Scenario, excluding pending and conceptual planned developments

Economic Index - URV's (Support to Mgeni System)



Economic Index - URV's **(Support to Northern Systems)**



Other aspects that could influence the reconciliation scenarios

- Water use rights trading.
- Implementation of the Reserve in the Mgeni River System (see information in further slides).
- Rainwater harvesting in the urban areas.
- Climate Change:
 - Incorporate results from the Mgeni Water Study when it is available.

Mgeni System (River Release Scenarios)

Location	Natural Flow (MAR)	Compensation flows #	EWR Scenario * (Class C)
Midmar Dam	201.7	28.4	47 (23.4%)
Nagle Dam	472.8	22.4	153 (32.3%)
Inanda Dam	629.7	47.3	216 (34.2%)

Notes: Values are given in million m³/annum.
Applied in water balances scenarios.
***** Low confidence EWR Scenario, for indicative yield estimates.
() Values in brackets indicate % of MAR

Mgeni System (Indicative Yield Estimates)

Subsystem	Historical Firm Yields (million m ³ /a)		Differences
	Compensation release scenario	EWR Scenario	
Midmar Dam	177	149	28
Nagle Dam	284	162	122
Inanda Dam	384	210	174

Notes: Yields for the development scenario including MMTS Phase 2.

Water available for the ecology downstream of Inanda Dam

Location	Flows (Mm ³ /a)					
	2006	2011	2016	2021	2026	2031
WWTW RF's	50.8	49.4	14.9	19.8	23.7	27.3
Smithfield Dam* (Surplus Yield)	0.0	0.0	0.0	135.5	103.1	73.5
Total	50.8	49.4	14.9	155.3	126.8	100.8

*Scenario I

Reconciliation Strategy (Current Perspective)

[1 of 2]

- Manage the short term deficit situation through WC/DM as well as early drought restrictions.
- Implement WC/DM waste management measures.
- Implement the Mooi-Mgeni Transfer Scheme.
- Implement the raising of Hazelmere Dam.
- Implement the North Coast Pipeline for short term support to KwaDukuza and long term support to the Mdloti System (bi-directional pipeline).
- Commission a feasibility study of the Thukela and Mvoti systems for supply to the Northern Areas.

Reconciliation Strategy (Current Perspective)

[2 of 2]

- Commission a feasibility study for water reuse options for supply to the North Coast and Mgeni River System (consider current and future wastewater sources).
- Proceed with the Feasibility Study of the Mkomazi River Transfer Scheme.
- Commission a feasibility study to confirm efficiency improvements – represented by Scenario A2.

***~ End ~
Thank You***