

#### water & sanitation

Department: Water and Sanitation REPUBLIC OF SOUTH AFRICA

# CLASSIFICATION OF SIGNIFICANT WATER RESOURCES IN THE MVOTI TO UMZIMKULU WATER MANAGEMENT AREA

**KZN Recon SSC Meeting 9** 

Presented by: Mmaphefo Thwala Directorate: Water Resource Classification

3 March 2016

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# **PURPOSE OF PRESENTATION**

- To provide feedback on the progress of the DWS study on the Classification of Significant Water Resources, determination of the Reserve and Resource Quality Objectives (RQOs) in the Mvoti to Umzimkulu Water Management Area
- To provide highlights on Implications of the recommended Class for future use



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# DRAFT CLASS: U4, MVOTI RIVER SYSTEM



### CATCHMENT CONFIGURATION, PROPOSED CLASSES & IMPLICATIONS FOR THE MVOTI CATCHMENT

IUA	Class	River	PES	REC	Implication	Target EC
U4-1	Ш	Mvoti	B/C	В	Improve riparian buffer in forestry and agriculture areas.	В
U4-1	=	Khamanzi	B/C	В	Improve riparian buffer in forestry and agriculture areas.	В
U4-3	1	Pambela	B/C	В	Reinstate riparian zone.	В
U4-3	I	Nsuze	B/C	В	Reinstate riparian zone.	В
U4-3	H	Nsuze	B/C	В	Reinstate riparian zone, erosion control.	В
U4-4		Mvoti Estuary	D	С	Improvement of oxygen levels in the estuary, through for example, removal of the high organic content from the Sappi Stanger effluent. Reduce the nutrient input from the catchment by 20%. Remove the sugarcane from the Estuary Functional Zone.*	С

- Recommended Scenario includes: Updated water demands; development demands & return flows; meeting the REC (low flows); Mvoti River Development Project (Isithundu Dam); Imvutshane Dam
- nodes require improvements based on non flow-related/anthropogenic issues that have to be addressed
- Proposed Isithundu Dam with specific EWR releases will have no impact on the Class. River components (geomorphology and fish) will be degraded from the present state.
- If the dam is implemented and operated according to the recommended scenario, GDP and jobs will improve

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# **Mvoti: Summary of Firm Yield result**

Scenario	EWR	Isithundu Firm Yield (million m³/a)	Reduction in yield due to EWR (million m³/a)
MV3	No	34.88	-
MV41	REC tot	8.02	26.86
MV42	<b>REC</b> low	15.22	19.66
MV43	REC low+	13.77	21.11

- Orange highlight recommended scenario
- EWR Impact on yield?
  - No impact do not need improved flows to achieve Target Ecological Category

# DRAFT CLASS: U1, UMKHOMAZI RIVER SYSTEM

U10.

No direct impact on users/economy and ecology. Two river reaches must be improved



One river reach to be improved (buffer zone, alien veg).

Future implications: DS of proposed dam – Cological objectives will not be met. Class will stay a II

> Future Implications: Geomorph, Fish, Invert ecological objectives will not be met in the uMkhomazi with a Dam. But Class will stay a II.

Future Implications: Geomorph, Fish, Invert Ecological objectives will not be maintained in the uMkhomazi with a Dam. But Class will stay a I.

U10D

**U10E** 

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#### CATCHMENT CONFIGURATION, PROPOSED CLASSES & IMPLICATIONS FOR THE UMKHOMAZI CATCHMENT

IUA	Class	River	PES	REC	REC Comment	Target EC
U1-1	I.	Nzinga	B/C B		Difficult to achieve the REC as catchment management would be required to amongst others manage sedimentation.	В
U1-1	I	uMkhomaz i	<sup>z</sup> B/C B		Difficult to achieve the REC as catchment management would be required to amongst others manage sedimentation.	В
U1-2	II	Elands	с	В	Target improvement especially in the upper reach. Buffer zone, alien removal, water quality practices. Also flow improvements but should be able to reach at least a B/C without any improvement in flow.	В
U1-3	II	Ngudwini	B/C	В	Address erosion to reduce sedimentation (overgrazing, forestry, informal agriculture). As none of the scenarios are relevant to this SQ, the improvement is valid irrespective of the recommended scenario.	В
U1-4	П	Mkobeni	с	в	Riparian buffer zone in forestry and agricultural areas. Also alien removal. As none of the scenarios are relevant to this SQ, the improvement is valid irrespective of the recommended scenario.	В
U1-4	II	Lufafa	B/C	В	Erosion control, riparian buffer. Due to the catchment scale of the problem, this is deemed to be difficult and the PES must be maintained.	B/C
U1-5		uMkhomaz i Estuary	С	В	Remove sand mining from the upper reaches to increase natural function, i.e. restore intertidal area. Restoration of vegetation in the upper reaches and along the northern bank in the middle and lower reaches, e.g. remove alien vegetation and allow disturbed land to revert to natural land cover (is already on upwards trajectory). Curb recreational activities in the lower reaches through zonation and improved compliance. Reduce/remove cast netting in the mouth area through estuary zonation or increased compliance.	B/C

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# DRAFT CLASS: U1, uMKHOMAZI RIVER SYSTEM Implications for future use

- Recommended Scenario MK21 includes: 2040 development demands; meeting the REC (total flows); Smithfield Dam, Ngwadini off channel storage
- nodes require improvements based on non flowrelated/anthropogenic issues that have to be addressed
- Smithfield Dam has to have specific EWR releases so that the operating rules will not impact on the Class and the overall state of the river.
- However, geomorphology, fish, invertebrates will be in worse state than present.
- If Smithfield Dam is implemented and operated according to the recommended scenario, GDP and jobs will improve.

 $\triangleright$ 

### uMkomazi: Summary of Firm Yield result

Scenario	Description	Smithfield HFY (million m <sup>3/</sup> a)	Ngwadini Historical Firm Yield (million m <sup>3/</sup> a)	Total Historical Firm Yield (million m <sup>3/</sup> a)	Difference in total Historical Firm Yield due to EWR (million m <sup>3/</sup> a)
MK2	No EWR; No support to Ngwadini	196.0	11.99	207.99	-
MK21	Total Flow EWR (EWR2); No support to Ngwadini	142.2	8.03	150.23	57.76
MK22	Low Flow EWR (EWR2); No support to Ngwadini	150.6	8.03	158.63	49.36
MK23	Low Flow+ EWR (EWR2); No support to Ngwadini	150.6	8.03	158.63	49.36
MK31	Total Flow EWR (EWR3); No support to Ngwadini	150.1	5.98	156.08	51.91
MK32	Low Flow EWR (EWR3); No support to Ngwadini	161.0	6.63	167.63	40.36
MK33	Low Flow+ EWR (EWR3); No support to Ngwadini	161.0	6.63	167.63	40.36
MK4	No EWR; Support to Ngwadini	142.5	54.8	197.3	-
MK41	Total Flow EWR (EWR2) ; Support to Ngwadini	84.1	54.8	138.9	58.40
MK42	Low Flow EWR (EWR2); Support to Ngwadini	92.5	54.8	147.3	50.00

- Orange highlight recommended scenario
- EWR Impact on yield?
  - No impact do not need improved flows to achieve Target Ecological
    - Category

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# DRAFT CLASS FOR U<sub>2</sub>, uMngeni RIVER SYSTEM



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#### CATCHMENT CONFIGURATION, PROPOSED CLASSES & IMPLICATIONS FOR THE UMNGENI CATCHMENT

IUA	Class	River	PES	REC	Implication	Target EC
U2-1		Ndiza	B/C	В	Reinstate riparian zone in forestry.	В
		Lions	С	В	Reinstate riparian zone in forestry and wetland buffers. Address irrigation return flows (wq) & town runoff	В
		Lions	B/C	в	IBT a given - constant flows, no seasonality, but reinstating wetland buffers (off channel) and riparian river zones	В
		Gqishi	B/C	В	Riparian zone buffer to be improved.	В
U2-2	ш	Yarrow	B/C	В	Agricultural area - wetland buffers,	В
		Karkloof	B/C	В	Reinstate riparian buffer zone and wetland buffers.	В
U2-4		uMnsunduz e	D/E	D	Water quality improvement	D
		Mpushini	B/C	в	Water quality from Ashburton amongst others.	В
		Mshwati	B/C	В	Lower section in worse state. Reinstate riparian zone, address erosion.	В
U2-5		Tholeni	С	B/C	Riparian zone buffer to be improved.	B/C
		Mqeku	B/C	В	Riparian zone buffer to be improved.	В

## uMngeni: Summary of Yield Implications

- Current and planned system operating rules (ultimate demand & return flows) can be implemented in the future.
- Scenarios analysed focused on assessing how future operation conditions could influence the ecological health
  There will mostly be improvement s except for the period just after augmentation of the uMngeni system
- Scenarios analysed achieved the REC and did not reduce the yield of the uMngeni system
- In all future scenarios releases were analysed with the prevailing operation rules
  - Release of 1.5 m3/s was assumed from Inanda Dam
- Future scenarios will have a positive impact on GDP and jobs.

## **DRAFT CLASS: Central Cluster IUA**



Class III and its catchment configuration will result in:

- 6 of 16 estuaries: Target Ecological Categories = Ecological objectives
- ➤ 10 an improvement on present state
- 4 maintain present state but do not achieve ecological objectives
- 2 Target states lie in a very poor (ecological) zone

# Class Implications for future use: Central Cluster IUA Estuaries

- All wastewater from uThonghati is reused (via Hazelmere Dam)
- Increase wastewater discharged into uMdloti estuary
- However, indirect re-use could take many years to implement.
- Interim approach to accommodate development pressure: Allow further discharge into uThonghati. (Ecological health will reduce to very poor over medium term)
- Design waste water treatment works for expansion for indirect reuse. (Target Ecological Category over long term will be an improvement of the current state)
- EWR must be implemented at uMngeni and pumping scheme operated for Umhlanga.
- No further waste must be discharged into the uMkhomazi estuary
- Further waste could be discharged in the Little Amanzimtoti and Mbokodweni as long as estuaries stay within acceptable standards for human use, e.g. recreation

# **STATUS OF THE PROJECT**

## Finalizing

- Implementation recommendations
- ✓ Main Report
- Close-out Report

### **Gazetting process underway**

- Proposed classes, TEC and RQOs
- ✓ Gazette notice sent to Chief State Law Advisor

## THANK YOU!!

### **CONTACT DETAILS**:

- Scientist production (Water Resource Classification): Ms Mmaphefo Thwala, Tel. 012 336 7976 <u>thwalam@dws.gov.za</u>
- Acting Director (Water Resource Classification): Ms Lebogang Matlala, Tel. 012 336 6536 <u>matlalal@dws.gov.za</u>
- Chief Director (Water Ecosystems): Ms Ndileka Mohapi, Tel. 012 336 8234 <u>MohapiN@dws.gov.za</u>
- Reports are available on: <u>http://www.dwa.gov.za/Documents/Policies/WRPP/default</u> <u>.htm</u> OR <u>www.dwa.gov.za/rdm/WRCS/default.aspx</u>