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Ncwabeni Off-Channel Storage Dam Feasibility Study: Module 1: Technical Study

SUPPORTING REPORT 4: PROPOSED INSTITUTIONAL AND FUNDING ARRANGEMENTS

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Directorate: National Water Resource Planning Private Bag X313, Pretoria, 0001

NCWABENI OFF-CHANNEL STORAGE DAM: FEASIBILITY STUDY

PROPOSED INSTITUTIONAL AND FUNDING ARRANGEMENTS

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i

Ncwabeni Off-Channel Storage Dam Feasibility Study – List of Study Reports



EXECUTIVE SUMMARY

Background

BKS (Pty) Ltd was appointed by the DWA in November 2012 for The Ncwabeni Off-channel Storage Dam Feasibility Study: Module 1: Technical Study.

The Ncwabeni Dam is in the Ncwabeni River, a tributary of the Mzimkhulu River, with locality of the proposed scheme as shown on **Figure A.1** in **Appendix A**.

An important part of the study was to recommend institutional and funding arrangements for developing and operating the dam. That is the subject of this report.

Institutional and Funding

The Ugu DM resolved in March 2011 that the construction of the Dam is approved. However the institutional and financial arrangements still need to be finalised. The capital funding requirement for the Ncwabeni OCS Dam is in the order of R580 million (excl VAT) in 2012 Rands. The cost of the dam excludes upgrading water treatment works and distribution pipelines.

If escalation and accumulated interest charges is included the dam will cost in the order of R900 million by 2017.

The funding and institutional options are interlinked. National Treasury has expressed the preference that the owner of the dam should also be the institution responsible for funding the dam.

The total water requirements and number of households that needs to be supplied in future by the planned Ncwabeni OCS dam is the sum of the current Umzimkhulu RWSS supply area and the unserved Umzumbe area, i.e. 58 000 households with an estimated population of 258 000 people. 50% of the households to be supplied from Ncwabeni Dam are classified as poor and will be unable to pay for water. It is accordingly recommended that at least 50% of the cost of constructing the dam should be funded out of the Regional Bulk Infrastructure Grant (RBIG).

Two funding options have been proposed:

- Either Ugu DM could raise funds for the project itself using a combination of RBIG funding, MIG and other grant funding, and limited commercial funding; or
- Ugu DM could appoint Umgeni Water as bulk water services provider for the Umzimkhulu RWSS and other areas supplied out of the dam, and Umgeni Water could fund the dam and the upgrading of the downstream water treatment works with a mix of RBIG funding, other grant funding if available, and commercial loans.

In the second option Umgeni Water could recover these costs from Ugu DM through Umgeni's universal bulk water tariff.

Whichever option is selected, National Treasury would need to be satisfied, after jointly assessing with the party responsible for raising the funds, that that party has the financial capacity to take on the additional financial burden. DWA would also need to be satisfied that the implementing party has the required skills to implement the project.

TABLE OF CONTENTS

1	INTRODUCTION1			
2	BENE	FICIAR	IES OF THE DAM	2
	2.1	Umzim	khulu Regional Water Supply Scheme	3
	2.2	Umzun	nbe supply area	3
	2.3	Total n	umber of beneficiaries and projected demand	4
3	POVE	ERTY		5
4	POSS	BIBLE SC	DURCES OF FUNDING	5
	4.1	Ugu all	ocates a portion of its MIG grant funding to the project	6
	4.2	Ugu ra	ises loan funding from commercial sources (bank loans)	6
	4.3	Nation	al Government funds the works on budget as a Government Water Work	7
	4.4	Nation	al Government provides grant funding through RBIG	8
		4.4.1	Application for RBIG funding	9
		4.4.2	Ringfencing of RBIG funds	10
		4.4.3	Water pricing implications of a mix of RBIG and commercial funding	10
	4.5	Umger Ncwab	ni Water appointed as bulk potable water service provider to fund and eni OCS dam and the Umzimkhulu Regional Water Supply Scheme	to operate 11
	4.6	Umger	ni Water provides bridging finance for the dam as implementing agent	13
5	OPEF	RATION	OF THE DAM AND ASSOCIATED BULK WATER WORKS	13
6	PREF	ERRED	FUNDING OPTION AND INSTITUTIONAL ARRANGEMENTS	14
	6.1	Water	tariff implications of options	15
	6.2	Way fo	prward	15
7	LEGIS	SLATIVI	E REQUIREMENTS	16
8	ECON	ΝΟΜΙΟ	CONTRIBUTION OF DAM	17
9	ASSE	SSMEN	IT AND MITIGATION OF RISKS	18
10	RECOMMENDATIONS:			
11	REFE	RENCE	S:	19

LIST OF FIGURES		
Figure 1:	Area to be supplied out of the proposed Ncwabeni OCS Dam	2
Figure 2:	Ncwabeni Dam Demand and Supply	4

LIST OF TABLES

Table 2.1:	Summary of water supply in the Umzimkhulu RWSS for 2010	3
Table 2.2:	House count for the Umzimkhulu RWSS supply area based on 2012 aerial photography	3
Table 2.3:	Summary of Umzumbe water supply area	4
Table 4.1:	Water pricing implications of dam funded as a Government Water Works	7
Table 4.2:	Water pricing implications of a mix of RBIG and commercial funidng1	1
Table 4.3:	Tariff implications if Umgeni Water appointed as bulk water services provider	2
Table 8.1:	Internal rate of return and benefit cost ratio of Ncwabeni OCS Dam 1	7
Table 8.2:	National macro economic impact of Ncwabeni OCS Dam1	7

LIST OF APPENDICES

APPENDIX A:	Figures
APPENDIX B:	Financial Calculations
APPENDIX C:	Extracts from National Water Act
APPENDIX D:	UGU DM Resolution

LIST OF ACRONYMS

Benefit cost ratio
Cost Benefit Analysis
District Municipality
Department of Water Affairs
Gross domestic product
Integrated development plan
Institutional realignment
Internal rate of return
Local Municipality
Mean annual sea level
Municipal Infrastructure Grant
Off-channel storage
Regional bulk infrastructure grant
Regional Water Supply Scheme
United States Dollar
Water Services Authority
Water services development plan
Water treatment works

1 INTRODUCTION

The existing Umzimkhulu Regional Water Supply Scheme (RWSS), which forms part of the KwaZulu Natal's Lower South Coast System, supplies water to the coastal region from Hibberdene to Ramsgate, including Port Shepstone. The water is presently sourced from non-regulated (un-dammed) river flows in the Umzimkhulu River. The water is abstracted at the St. Helen's Rock abstraction works near Port Shepstone and is pumped into the water treatment works. From there the water is distributed to the various user nodes.

During dry periods, the unregulated (undammed) river flow is insufficient to meet the water requirements, even without provision for the release of the ecological Reserve.

In order to provide for the water requirements for all user sectors, including the Reserve, the construction of an off-channel storage (OCS) dam in one of the tributaries to the Umzimkhulu River, was recommended by The Southern KwaZulu-Natal Water Resources Pre-feasibility Study Phase 1 (DWAF, 2002). The reservoir will be filled from its incremental catchment, supplemented by pumping from the Umzimkhulu River during times of high river flows. During times of low flows water will be released back into the Umzimkhulu River for abstraction downstream at the existing St. Helen's Rock abstraction works.

The 2nd phase of the Southern KwaZulu-Natal Water Resources Pre-feasibility Study (DWAF, 2005), as well as the Mzimkhulu River Off-Channel Storage (OCS) Pre-feasibility Study (DWAF, 2007), investigated various sites for an OCS dam along the Lower Umzimkhulu River. The most favourable two sites were found on the Ncwabeni and Gugamela Rivers, which join the main river about 25 km upstream of the St Helen's Rock Abstraction.

The DWA, has subsequently undertaken a feasibility study (this study) of the proposed OCS dam in the Ncwabeni tributary of the Umzimkhulu River. More detail on the Ncwabeni OCS Dam Project is included in the *Supporting Report 3: Design and Cost Estimates Report*. The location of the proposed Ncwabeni OCS dam and it's alternative are included in Figure A1 in Appendix A. A layout of the Scheme is presented in Figure A2 in Appendix A.

The primary components of the Ncwabeni OCS Dam Project are:

- An abstraction weir on the main Umzimkhulu River approximately 2m high from river bed level.
- An abstraction works to remove silt and sand from the water diverted by the weir.
- A pump station located on the left-hand bank (northern bank) of the abstraction weir. Water will be pumped from the abstraction works to the dam via a rising main pipeline with a capacity of 0,75 m³/s.
- A new high voltage power line to bring electrical power to the site.
- A 45 m high rockfill dam on the Ncwabeni tributary of the Umzimkhulu River, with associated reservoir storage of approximately 15 million m³ and Full Supply Level at 167,5 m.
- The dam will have a yield of approximately 32 million m³/annum.
- The dam is planned to first supply water in 2018 and should be able to satisfy the growth in demand of the Umzimkhulu Regional Supply Scheme and lower portions of Umzumbe until approximately the year 2040.
- The capital funding required for the Ncwabeni OCD Dam Project is in the order of **R570 million in 2012** Rands. The cost of the dam excludes upgrading water

treatment works and distribution pipelines. Including escalation and accumulated interest charges the dam will cost in the order of **R900 million by 2017**.

• It is understood that the existing water treatment works has a capacity of approximately 54 ML/day (about 20 million m³/a). The plant needs to be upgraded by 50% to a capacity of approximately 81 ML/day. Ugu District Municipality (DM) has made provision for the funding of the treatment works on their MIG allocation budget. Additional funding would also be required for additional bulk distribution pipelines, but these could be constructed over time.

2 BENEFICIARIES OF THE DAM

Ugu DM has a population of approximately 710 000 (Household Survey Data Stats SA 2007).

The District Municipality is the Water Services Authority and comprises six Local Municipalities, namely Hibiscus Coast, Ezinqoleni, Umuziwabantu, Vulamehlo, Umzumbe and Umdoni.

The dam will supply water to areas within the Ugu DM (Figure 1), namely:-

- It will be the primarily supply of water to the existing Umzimkhulu Regional Water Supply Scheme (Hibiscus Coast LM purple area in figure);
- It will supplement the water supply to Umzumbe (Orange area) of the Mhlabatshane Scheme which is only able to meet the future full demand of part of the Umzumbe LM rural areas (green area); and
- It will also replace the supply of the small existing Assissi WTW which is unable to meet the demand in its supply area of the Umzumbe LM (yellow area).



Figure 1: Area to be supplied out of the proposed Ncwabeni OCS Dam

A summary of the supply to each of the areas is now provided in **section 2.1**. More detail is available in **Supporting Report 1**: Water Requirements and Water **Resources**.

2.1 UMZIMKHULU REGIONAL WATER SUPPLY SCHEME

The proposed Ncwabeni OCS dam will augment the Umzimkhulu RWSS. The current demand of the Umzimkhulu RWSS is 18.26 million m^3/a (2010) based on actual water supply information (**Table 2.1**).

User	Volume (m³/a)	Percentage of total
Urban	7 326 739	56%
Rural	3 416 604	26%
Commercial	2 303 375	18%
Total before losses	13 046 718	100%
Losses	5 212 470	
Total	18 259 188	

Table 2.1:	Summary of water supply in the Umzimkhulu RWSS for 2010
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The number of households associated with the supply area in 2010 was determined by a house count as presented in **Table 2.2**.

Table 2.2:	House count for the Umzimkhulu RWSS supply area based on 2012
aerial photog	raphy

	Urban	Rural	Total
Houses	16 944	7 472	24 416
Dwellings/huts		22 546	22 546
Total Households	16 944	30 018	46 962
Schools	16	52	68
Hospitals	6	1	7
Clinics	0	21	21

Ugu DM's IDP estimates that there are 50 650 households in the Hibiscus Coast area which compares favourably to the 46 962 counted. The IDP estimates population at 222 281 giving 4.7 persons per household on average.

2.2 UMZUMBE SUPPLY AREA

That part of the Umzumbe Local Municipality that surrounds and lies to the north of the proposed dam has limited or no water supply services. Some smaller stand-alone schemes do exist in the area, but the supply from these is limited.

Currently the Mlhabatshane Regional Water Supply Scheme is being implemented in the northern part of the Umzumbe area between the Umzimkhulu and Umzumbe rivers. The Mlhabatshane RWSS will however not have sufficient water to supply the full Umzumbe supply area and will need to be supplemented from the Ncwabeni OCS Dam via the Umzimkhulu RWSS or via a new water treatment works.

Also included in the Umzumbe supply area is the Assisi scheme supply area. The Assisi Scheme is a small water supply scheme that abstracts water from the lower Umzumbe River. There is insufficient water for the Assisi scheme to supply the full

desired level of service. As such the water requirements of the Assisi scheme will also be supplied out of the Ncwabeni Dam via the Umzimkhulu RWSS.

The number of houses/huts and population of the Umzumbe area, together with the associated water requirements at the desired level of service is shown in **Table 2.3**.

PRESENT DAY (2010) Water SUB SUPPLY AREA Houses Huts Population Schools Clinics Hospitals requirement million m³/a 1 155 32 830 108 083 48 8 0 3.17 Umzumbe supply area Umzumbe to be supplied by 732 22 068 5 2.74 72 359 44 0 Mhlabatshane RWSS (North Western Portion) Umzumbe to be supplied by 423 10 762 35 724 4 3 0 0.43 Umzimkhulu RWSS (Ncwabeni OCS Dam)

 Table 2.3:
 Summary of Umzumbe water supply area

2.3 TOTAL NUMBER OF BENEFICIARIES AND PROJECTED DEMAND

The total water requirements and number of households that needs to be supplied in future by the planned Ncwabeni OCS dam is the sum of the current Umzimkhulu RWSS supply area and the unserved Umzumbe area, ie 58 000 households with an estimated population of 258 000 people.

The current urban/rural split is about 70% urban and commercial and about 30% rural. The projected total demand from Ncwabeni is shown in **Figure 2**: Ncwabeni Dam Demand and Supply.



Figure 2: Ncwabeni Dam Demand and Supply

3 POVERTY

Studies on poverty show that eThekwini has by far the lowest poverty rate (24.6%) in KwaZulu-Natal, and is the only region in the province with a poverty rate estimate below the national average. The remainder of the KwaZulu-Natal regions all have poverty estimates above the national average ranging from 51% for Umgungundlovu to a very high 80% for Umzinyathi.

Some of these areas, including Ugu, Umzinyathi, Zululand and Umkhanyakude have been identified during the Presidential State of the Nation address in 2001 as 'nodal areas' that would be targeted for rural development programs.

Poverty in the Ugu District is unevenly distributed with Umzumbe municipality being the worst affected followed by Hibiscus Coast. In 2008 it was estimated that 394 623 people, then **55% of the population**, were living in Poverty in Ugu District; while 15 508 people in the District were living with less than united states dollar (USD) 1 per day, ie in extreme proverty (Ugu, 2010).

Based on these studies it is estimated that approximately 50% of the population being supplied out of Ncwabeni OCS Dam will not be able to pay for water.

4 POSSIBLE SOURCES OF FUNDING

An important component of the feasibility study is to recommend how the dam will be funded as well as institutional arrangements for funding and operating the dam. Consultations have been held with Ugu DM officials and water portfolio committee, Umgeni Water at a technical/official level, COGTA, National Treasury and within DWA in this regard.

A formal presentation will not be made to the board of Umgeni Water until the Ugu DM water portfolio committee has expressed their preference.

It is evident that the funding arrangements and the institutional arrangements are interdependent. This statement will become clearer when the sources of funding discussed below are considered.

The following sources of funding have been considered, either as stand-alone sources, but more likely as partial solutions in combination with others:

- Ugu allocates a portion of its MIG grant funding to the project;
- Ugu raises loan funding from commercial sources (bank loans or softer loans from DBSA);
- National Government funds the scheme on-budget as a Government Water Works;
- National Government provides a special/dedicated grant using the Regional Bulk Infrastructure Grant (RBIG) mechanism;
- Umgeni Water funds the works as a bulk water services provider;
- Umgeni Water provides bridging finance as implementing agent.

These sources of funding, which can be used in certain combinations, are now evaluated:-

4.1 UGU ALLOCATES A PORTION OF ITS MIG GRANT FUNDING TO THE PROJECT

Ugu DM estimates in their revised 2011/12 IDP, that they require R2 billion to eradicate the January 2011 water backlog of 29 %. To place this amount in context, Ugu DM's CAPEX budget for the 2011/12 Financial Year as follows:

- Capital grants from National Government is R310 million (for all purposes not only water),
- Capital expenditure budgeted for water is R226 million,
- Capital expenditure budgeted for waste water management is R116 million.

Ugu DM accepts that it will not be able to meet the Millenium goal of eradicating the backlog by 2014.

It appears that the Ugu DM MIG grant funding is already over allocated to the services backlog and it is unlikely, given their social responsibility, that Ugu DM will be in a position to allocate significant MIG funding to the Ncwabeni OCS Dam (+- R850 million by 2017).

It is more appropriate that Ugu DM contributes MIG funding towards addressing their retail supply backlog and upgrading their existing water treatment works and bulk distribution pipelines than contribute MIG funding towards the Ncwabeni OCS Dam.

To this effect Ugu DM has budgeted R48,3 million for Umzimkhulu Augmentation in the 2011/12 financial year.

Ugu DM Portfolio Committee has yet to confirm that they will not be in a position to allocate significant MIG funding to finance the Ncwabeni OCS Dam but it is anticipated that this will be the case.

4.2 UGU RAISES LOAN FUNDING FROM COMMERCIAL SOURCES (BANK LOANS)

Ugu DM's operations budget for 2011/12 was as follows:

- Total revenue including transfers is R694 million of which R386 million was from water and sanitation revenue.
- Total expenditure is R681 million;
- A surplus of only R14 million is budgeted.

However the reality is that this surplus will not be achieved. Current expectations are that there will be an operations loss of approximately R200 million.

Ugu's water tariffs for 2011/12 are as follows:

Basic charges

- Rural domestic R26.95
- Sub-economic domestic R25.52
- Other (industrial and domestic) R107.79

Volume charges on water sales

- Domestic stepped tariff
 0 39 kl/month R8.43/kl
 39 51 kl/month R13.51/kl
 >51 kl/month R15.19/kl
- Free Basic Water Standpipes R8.43/kl

- Commercial <30 kl R8.43/kl
- Commercial >30 kl R16.86/kl
- Sisonke bulk water R3.75/kl

Given the level of poverty in Ugu DM it is clear that Ugu DM is already charging a reasonable tariff and simply raising tariffs will not provide a simple solution to addressing its financial challenges.

Ugu DM Portfolio Committee has yet to confirm that they will not be in a position to raise significant loan funding to finance the Ncwabeni OCS Dam but it is anticipated that this will be the case.

4.3 NATIONAL GOVERNMENT FUNDS THE WORKS ON BUDGET AS A GOVERNMENT WATER WORK

Chapter 11 of the National Water Act gives the Minister the power to establish and operate government waterworks in the public interest out of funds allocated by Parliament or from other sources.

Examples of such waterworks include water storage dams, water transfer schemes and flood attenuation works.

There is not a strong motivation to declare the Ncwabeni OCS dam as a government water work in that it is a local dam serving only one district municipality and is not interlinked into a system of waterworks, nor is it of national strategic importance.

The Minister is of course not prohibited from declaring the dam a Government Water Works if it is in the national interest.

Water from a government waterwork may be made available for allocation to water users and charges may be fixed for this water.

If the dam is funded on budget by Government then the tariff will be determined in accordance with DWA's National Water Pricing Strategy as published in Government Gazette No 29697 of 16 March 2007. The tariff would include a depreciation charge, a return on assets charge of 4% p.a. as well as the operations and maintenance costs.

The price of water from the dam being wholly funded as a Government Water Works is shown in **Table 4.1**. The calculations behind **Table 4.1**, are included in **Appendix B**.

Table 4.1:Water pricing implications of dam funded as a Government WaterWorks

	Key Assumptions	Rand per Kl 2012 equivalent
RAW WATER FROM DAM ONLY		
Government Water scheme	Depreciation 10% of civil works	R1.50 per kl raw water
Ncwabeni OCS Dam only	depreciated over 45 years and	sold from dam.
(Depreciation, ROA, O&M)	40% of Mechanical and Electrical	
	works depreciated over 30 years.	

Note that the Minister is unlikely to declare the water treatment works and other bulk works as Government Water Works. The above price is accordingly only for constructing and operating the dam.

4.4 NATIONAL GOVERNMENT PROVIDES GRANT FUNDING THROUGH RBIG

In light of the recognition given to water projects as mechanisms to create employment in the latest Presidential State of the Nation Address, the relative poverty of the population residing in the Ugu DM area, and the social benefits of this project, there is a strong motivation for government to favourably consider making a grant available to this project. In this context it should be noted that some 50% of the water supplied out of the dam will be provided to people who cannot pay for water.

National Treasury has allocated special funding for regional bulk water services infrastructure amounting to R5,738 billion over six years starting during 2007/2008 This grant is known as the Regional Bulk Infrastructure Grant (RBIG).

- 2007/2008 R300 million
- 2008/2009 R450 million
- 2009/2010 R611 million
- 2010/2011 R839 million
- 2011/2012 R 1675 million
- 2012/2013 R 1862 million

Bulk infrastructure connects the water resources to the distribution system which supplies water to the consumers, and also includes waste water infrastructure such as waste water treatment plants (DWA, 2010)

The Ncwabeni OCS Dam is a bulk regional dam, as opposed to a national dam, as the full supply area falls within the Ugu DM. The National DWA Coordinator of the RBIG has confirmed that in principle RBIG can be used for the funding of the social component of the dam (approximately 50%).

The KZN Regional Office RBIG Coordinator has confirmed that the KZN Regional strategy is to allocate approximately R30 million per DM per year of the current allocation, thus ensuring an equitable distribution between DM's. If RBIG were to be used as a vehicle for allocating grant funding to the Ncwabeni OCS Dam, it would be preferable if National Treasury made a special allocation over and above the current RBIG allocation.

The amount of the grant, whether from RBIG or through another mechanism (perhaps donor funding) should at least cover the percentage of the water that will be allocated to the rural poor who cannot afford to pay for water (approximately 50% of the cost of Ncwabeni OCS Dam) as well as the cost of upgrading the water treatment works and the bulk distribution pipelines.

[Ncwabeni OCS Dam has not been placed on DWA's Estimates of National Expenditure (Vote 38)].

Although Ncwabeni is a local dam, dams of this size present a significant dam safety risk. It is preferable that DWA or another well qualified implementing agent such as Umgeni Water should manage the construction of the dam. The proper management of the design and construction can be ensured under the RBIG policy especially where a large percentage of the dam is to be funded by RBIG and not by the municipality.

4.4.1 Application for RBIG funding

The submission for project funding applications through the Regional Bulk Infrastructure Grant must address the following:-

- Compliance to water resource policy and legislation.
- Proven implementation readiness: All preparatory work must be completed and approved, including project specific implementation feasibility studies, environmental impact assessments, environmental authorisation and water use licensing, social acceptance, financing and institutional arrangements.
- Need for funding. The entity applying for funding of a project needs to illustrate that is has limited financial ability to source the required funds and motivate why the social component of the project should be funded through RBIG. DWA may request specific economic viability assessments (refer to chapter 6).
- A financing plan must be in place showing the combination of its various funds and financing arrangements, cash flow projections and overall financial viability of the project.
- Co-funding must be secured for the economic (higher level of services) components. The calculation method for the social and economic components must be clearly demonstrated and quantified according to specification (e.g. the proportional cost based on volumetric water use).
- Ownership of infrastructure: Prior to construction of the infrastructure it must be agreed who will own the infrastructure and how and when ownership will be assumed. This may require a transfer agreement between the relevant institutions.
- Any infrastructure funded through RBIG will belong to the relevant WSA or WSAs, with the exception where the WSA or WSAs are deemed not to have adequate capacity. In such circumstances ownership will be given to a water board or temporarily given to DWA.
- Institutional commitment: Roles and responsibilities for sustainable management must be agreed upon and proven through service provider contracts.
- Water licensing and environmental acceptability: All projects must have approved water licenses in place for the full water requirement of the scheme and must comply with environmental conditions and requirements.
- Compliance to water conservation measures: All projects must prove that water loss reduction and water demand management options have been implemented satisfactorily to warrant further water supply augmentation.
- Acceptable asset management plans and systems: All projects must demonstrate adequate steps to ensure long-term sustainable operation and maintenance of the infrastructure assets (including asset management plans and systems). Note – this fund is not to be used to endorse/reward poor asset management.
- Referenced in the IDP and WSDP: All projects must be aligned with and listed in the WSDP and IDPs of participating authorities. Such alignment will be confirmed by the project feasibility studies and checked by the project assessment panel.
- All proposed projects must identify and specify the amount of anticipated involvement and benefit of SMMEs and BEE enterprises.

Projects will be selected by the Provincial Adjudication Committee on merit. The following criteria are amongst those that will be applied to evaluate and prioritize project proposals:

- General criteria (screening), eg compliance with Division of Revenue Act
- Prioritization criteria, specifically Strategic importance:
- Social criteria:
- Economic criteria:
- Technical criteria:
- Institutional criteria:
- Financial criteria:
- Legal criteria:
- Sustainability criteria

For full details of these criteria see *Water Services Regional Bulk Infrastructure Programme – Framework for Implementation* (DWA, 2010).

Rules of the Grant include that:

- The project must be proposed by a suitable water services institution.
- The project must take into account the Integrated Development Plan (IDP) of municipalities, prepared in accordance with the Municipal Systems Act, especially the water services development plans (WSDP).
- Infrastructure developed or obtained through the Grant must be owned by a relevant WSA, a combination of a number of WSAs or a water board.

According to National Treasury the institution that raises funding for the dam should be the owner of the dam. The owner of the proposed dam should accordingly lead the RBIG application process. Support in preparing the application can be given by DWA.

DWAs Director General is the transferring national officer responsible for the implementation of the Grant. The Grant provides funding for feasibility studies and other studies required to prepare an application for funding.

4.4.2 Ringfencing of RBIG funds

It is important to note that the RBIG funding is allocated for a specific project. The funds must accordingly be accounted for against the project.

Because a substantial amount of funding is involved it is recommended that the RBIG allocation should include specific cost accounting, procurement and contract reporting conditions.

4.4.3 Water pricing implications of a mix of RBIG and commercial funding

While it is recommended that the RBIG grant may be in the order of 50% of the cost of the project it is also possible that a smaller percentage of the cost of the project is granted through RBIG funding.

If it is assumed that the remainder of the cost of the dam would be funded out of commercial sources then the effect of RBIG funding on the price of water sold from the dam would be as set out in Table 4.2. Calculations are included in Appendix B.

Table 4.2: Water pricing implications of a mix of RBIG and commercial funidng

	Key Assumptions	Rand per Kl 2012 equivalent
RAW WATER FROM DAM ONLY		
100% of Ncwabeni OCS Dam	6% p.a. inflation;	R1.96 per kl raw water
funded by commercial loans	9,5% interest rate	sold from dam.
(Loan Redemption and O&M)		
75% of Ncwabeni OCS Dam	6% p.a. inflation;	R1.47 per kl raw water
funded by commercial loans and	9,5% interest rate	sold from dam.
25% funded by Grant Funding		
(Loan Redemption and O&M)		
50% of Ncwabeni OCS Dam	6% p.a. inflation;	R0.98 per kl raw water
funded by commercial loans and	9,5% interest rate	sold from dam.
50% Grant Funding		
(Loan Redemption and O&M)		

4.5 UMGENI WATER APPOINTED AS BULK POTABLE WATER SERVICE PROVIDER TO FUND AND TO OPERATE NCWABENI OCS DAM AND THE UMZIMKHULU REGIONAL WATER SUPPLY SCHEME

According to the Water Services Act, the core function of Umgeni Water is to provide bulk potable water services to other water services institutions. Umgeni Water does however operate a number of dams for the Department of Water Affairs.

DWA however recognises that Regional Water Utilities have an important role to play in providing local infrastructure, be this bulk or distribution infrastructure (retail).

DWA is currently, through its Institutional Realignment (IR) Project, re-assessing the role of water boards with the intention of restructuring the current water boards to be Regional Water Utilities with the following responsibilities (DWA, 2012):-

- Provide regional water resource infrastructure;
- Provide regional bulk water supply infrastructure;
- Provide local water supply infrastructure on behalf of municipalities;
- Support municipalities in 'mostly rural' areas to build water services operational systems and management capacity through management contracts set under a national support programme; and
- Support municipalities generally.

In support of DWA's IR direction of Regional Water Utilities, Umgeni Water also has a strategy of increasing its area of supply.

Umgeni Water is already providing services within parts of the Ugu DM under a bulk water services provider agreement and Umgeni Water has indicated that it would favourably consider providing bulk potable water services in the areas supplied by the Ncwabeni Dam. Although the service area under consideration does not currently fall within Umgeni Water's area of supply this is not an obstacle and can be easily addressed by the Minister in a Government Gazette proclamation.

Such an arrangement could involve the following:-

The current value of Ugu's Water Treatment Plants (and possibly Waste Water Treatment Plants) affected by the Ncwabeni OCS Dam would be determined.

A quid quo pro arrangement would be agreed whereby Umgeni Water takes ownership of and operations responsibility for the treatment works and upgrades them; and raises private sector capital to partly fund the Ncwabeni OCS Dam and abstraction works.

Umgeni Water could apply to utilise Regional Bulk Infrastructure Grant (RBIG) funding to partially offset the costs of upgrading the treatment plants and the construction of the dam.

The current WSP agreement between Ugu DM and Umgeni Water would be varied in terms of which Umgeni Water would own and operate the dam and treatment works as part of the Umgeni Water system.

The involvement of Umgeni Water as owner should have the additional advantage of facilitating an improvement in the maintenance of the dam and treatment works and should contribute towards reducing the non-revenue water component.

The advantages of this option should be considered by the Ugu DM Portfolio Committee in the context of the DM not having the funds to construct the dam without financial support.

The disadvantage of this option is that Umgeni Water has a number of large investments planned which will stretch their balance sheet; for example the Spring Grove Dam (currently being completed), Lower Thukela Bulk Water Transfer Scheme, and the eMkhomazi Water Project Phase 1 (most of the investment to be incurred from 2020 to 2023) and desalination plants on the North Coast and South Coast.

eThekwini, the major customer of Umgeni Water, has also planned a number of investments including the western carrier and possible re-use and desalination schemes.

National Treasury has indicated that they would need to confirm to what extent Umgeni Water could absorb the Ncwabeni OCS Dam investment on their balance sheet.

This option should only be discussed with the board of Umgeni Water once Ugu DM has confirmed their view on this option.

If the dam and bulk water treatment and distribution system is funded by Umgeni Water and incorporated into their bulk water system then the dam will have an effect on the Umgeni Water universal bulk water charge (i.e. the tariff charged to all bulk water users) but will not be a specific charge levied on Ugu DM. Ugu DM would pay the universal Umgeni Water charge (Table 4.3). Calculations for Table 4.3 are included in Appendix B.

	Key Assumptions	Rand per Kl 2012 equivalent
BULK POTABLE WATER DELIVER	RED INTO MUNICIPAL RESERVOIR	R
Umgeni as bulk supplier Ncwabeni OCS Dam, Bulk WTW, Distribution, Operations of dam and bulk. Possible utilization of RBIG funding for 50% of dam plus the bulk.	The Umgeni Water bulk potable tariff will not change substantially.	Current average charge of R3.56 per kl bulk potable water supplied by Umgeni.

Table 4.3:Tariff implications if Umgeni Water appointed as bulk water servicesprovider

Note however that Umgeni Water has not given any commitment that the price of water supplied by them from the dam and water works would be subject to the Umgeni Water universal tariff. Consultations with the board of Umgeni Water will only be held once Ugu DM has confirmed their preferences on how to fund and implement the dam.

4.6 UMGENI WATER PROVIDES BRIDGING FINANCE FOR THE DAM AS IMPLEMENTING AGENT

Should DWA decide not to manage the construction of the dam in-house, and if it is agreed that Ugu DM should not be tasked with constructing the dam, then DWA/Ugu DM could appoint Umgeni Water as an implementing agent to manage the construction on its behalf.

Umgeni Water has no objection to being appointed as Implementing Agent. Umgeni Water has both the capacity and the experience to manage the construction of such works.

However, according to the Water Services Act, this would be a non-core function of Umgeni Water.

As Implementing Agent, Umgeni Water would construct the works for a fee and would recover the full cost of the works as a stand-alone or ring fenced project. In other words there would be a requirement for either grant funding from national government and/or a firm repayment agreement with Ugu DM which would together cover the full cost of the works. Such agreements would be independent of the ability of Ugu DM to recover the cost of the works from consumer tariffs as that would not be a matter within Umgeni Water's control.

The financial risk would not be passed onto Umgeni Water and there would accordingly be no long term funding/financial advantage in this option other than that Umgeni Water loans bridging finance to Ugu DM.

The only advantage of this option would be that a skilled and experienced implementing agent manages the procurement and construction of the works.

5 OPERATION OF THE DAM AND ASSOCIATED BULK WATER WORKS

Ugu DM is currently operating the Umzimkhulu RWSS.

It is evident from the Blue and Green Drop reports that Ugu DM is performing satisfactorily.

Ugu DM Blue Drop score for 2011 was 92,82%. The Regulator was most optimistic regarding the continued improvement of the drinking water quality management performance of the municipality. Apart from 1 system Ugu DM showed a marked improvement in Blue Drop scores for all 16 systems when compared to 2010 results. Four water supply systems were awarded Blue Drop status. DWA acknowledged the contribution of Umgeni Water as bulk services provider in two of the systems receiving Blue Drop Status.

Ugu DM's Green Drop score for 2011 was 70%. The Green Drop report states that Ugu DM has for the most part performed satisfactory and with consistent improvement indicating that the waste water services are for the most part being managed according to the expectations of the regulation programme.

The main concern is Ugu DM's current operating budget shortfall and the stretched operating and capital budget going forward. Non-revenue water in Ugu District is also relatively high at about 34%.

Umgeni Water has an existing bulk water services provider agreement with Ugu DM but does not act as services provider in the Umzimkhulu RWSS area.

There are a number of funding and capacity advantages if Umgeni Water were to extend its role in the District and to own and to operate the dam and regional water supply scheme supplied out of the dam as the bulk water services provider.

6 PREFERRED FUNDING OPTION AND INSTITUTIONAL ARRANGEMENTS

While a number of sources of funding have been discussed, the most feasible funding and related institutional options can be summarised as follows:

Option 1: Ugu DM as funder, implementer and operator

- Ugu DM provides evidence that they can, together with a say 50% RBIG contribution, fund the dam and treatment works.
- UGU DM makes an application for RBIG funding, with DWA assistance, to fund the social component of the dam, say 50% of the R900 million cost (excluding VAT but including escalation and interest), as well as the phased (multi-year) upgrading of the water treatment works and the bulk distribution pipelines.
- The viability of this option will need to be confirmed by Ugu DM Water in cooperation with National Treasury.
- Ugu DM as the owner of the dam operates and maintains the dam and meets dam safety requirements and water use license requirements.
- Ugu DM could appoint Umgeni Water as implementing agent at an agreed fee to supervise the Dam design and construction. Alternatively DWA could provide support to Ugu DM who procures the dam design and construction.

Option 2: Umgeni Water as bulk water services provider, funder and operator

- Ugu DM and Umgeni Water enter into a bulk water services provider agreement in terms of which Umgeni Water is obliged to fund the dam and in a phased manner upgrade the water treatment works and recover their disbursements through bulk water tariffs.
- Umgeni Water makes an application for RBIG funding, with Ugu DM and DWA assistance, to fund the social component of the dam, say 50% of the cost of the dam, as well as the phased (multi-year) upgrading of the water treatment works and the bulk distribution pipelines.
- The viability of this option together with Umgeni Water's other large planned investments will need to be confirmed by Umgeni Water in cooperation with National Treasury.
- Umgeni Water, as owner of the dam, applies for a water use licence and for environmental authorisation with formalised (written agreement) DWA assistance;

- Umgeni Water as owner of the dam supervises the Dam design and construction.
- Umgeni Water as owner of the dam operates and maintains the dam and meets dam safety requirements.

6.1 WATER TARIFF IMPLICATIONS OF OPTIONS

It is difficult to do a comparison of the impact on the retail price of water for the two alternatives until the exact funding mix is known.

As a benchmark, the average charge obtained by dividing all of Ugu DM's budgeted water service charges (monthly charges and variable charges) by Ugu DM's budgeted water consumption gives an average unit retail charge of R14.27 per kl. Note that this is not Ugu DM's per unit variable charge. Ugu DM's variable charges are set out in sub-paragraph 4.2 above.

If, as is envisaged in Option 1 above, the dam is funded by Ugu DM with a mix of 50% RBIG and 50% commercial funding (which is perhaps not achievable by Ugu DM at this time) then the price of water from that dam will be in the order of R98 c/kl (2012 Rands). If this additional cost of water is allocated only to those users who receive water from the dam then the average unit retail charge will rise from approximately R14.27 per kl to R15.25 per kl. The higher the percentage of grant funding that Ugu DM can raise and the large user group over which the cost of water from the dam is allocated, the less the cost impact of the dam on the average retail price of water.

if the dam is funded by Umgeni Water and incorporated into their bulk water system as envisaged in Option 2 above then the dam will have an effect on the Umgeni Water universal bulk water charge (ie the tariff charged to all bulk water users) but will not be a specific charge levied on Ugu DM. Ugu DM would pay the universal Umgeni Water bulk water charge of approximately R3.56 per kl. The cost of abstracting and treating bulk water is not differentiated in the Ugu DM budget from other water related costs. If it is assumed for example that 30% of Ugu DM's water costs are attributable to abstracting raw water and producing bulk potable water then the average unit retail charge will drop from approximately R14.27 per kl to R13.07 per kl [R3.56 +70% of R14.27] if Umgeni provides the bulk water and Ugu DM only manages the retail water.

This last calculation is merely a realistic example and it will be necessary for the Ugu DM's budgeting team, perhaps with the assistance of National Treasury, to determine the real budgetary impact of entering into a bulk WSP agreement with Umgeni Water.

6.2 WAY FORWARD

A formal response is now required from Ugu DM Portfolio Committee on their preference.

If Ugu DM elects to apply for RBIG and other grant funding and to undertake the implementation themselves then certain safeguards will need to be put in place:

National Treasury would need to be satisfied that Ugu DM has the capacity to fund the shortfall between the cost of implementation and the total available grant fundiing.

DWA, and especially its dam safety office, would need to be satisfied that the required project management skills are in place and that a proper procurement procedure is followed that will ensure that a properly qualified dam design consultancy and dam construction contractor are appointed.

If Ugu DM agree to appoint Umgeni Water as the bulk water services provider with the mandate to implement the dam then consultations between Ugu DM, Umgeni Water, DWA and National would need to commence to confirm Umgeni Water's current capacity, both in skills and in financial resources, to implement the works.

7 LEGISLATIVE REQUIREMENTS

The National Water Act, Act 36 of 1998 requires, inter alia, that:

- The owner of the proposed Ncwabeni Dam obtain a water use licence before disturbing the water course and constructing the dam; [In terms of s 21 of the National Water Act, taking of water from a water resource, storing water and impeding or diverting the flow of water in a water course are all water uses.]
- That the Minister determine a preliminary reserve for the water course before the water use licence is issued;
- That the owner of the proposed dam appoint an approved professional person to report to the Minister on the safety of the dam.
- That owner of the proposed dam appoint an 'Approved Professional Person' to design the dam; and
- That the owner of the proposed dam register the dam as a dam with a safety risk.

It can be seen that the onus for the licence application and for appointing the approved professional person(s) rest with the owner of the dam.

For purposes of addressing the National Water Act requirements, the owner of the dam must consequently be confirmed early in the implementation process.

The RBIG application also requires the early confirmation of which institution is the owner of the dam.

Accordingly it is recommended that Ugu DM take ownership of the Dam and, with the assistance of DWA, make the necessary water use licence applications and the appointment of the Approved Professional Person.

Selected abstracts from the National Water Act are provided in Appendix C.

[The above recommendations and abstracts are merely a high level summary and should be read in the context of the the full Act and its regulations.]

8 ECONOMIC CONTRIBUTION OF DAM

As part of the Feasibility Study, a Cost Benefit Analysis (CBA) was conducted that provided information to the EIA (Module 2). This section briefly summarises the key findings of the CBA.

The cost-benefit of the dam is summarised in Table 8.1 and Table 8.2.

Table 8.1:Internal rate of return and benefit cost ratio of Ncwabeni OCS Dam(current price 2012 values)

Parameter	Discount Rate 6%	Discount Rate 8%			
Net Present Value	R 1 474.1 mil.	R 1 295.3 mil.			
IRR	14.9%	13.9%			
BCR	3.64	3.32			

The macro economic contribution of the dam is summarised in Table 8.2.

Table 8.2:	National macro	economic imp	pact of Ncwaben	i OCS Dam
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	Construction phase	Operations Phase	Total Impact of Dam
Impact on Gross Domestic Product (GDP)	R 730 mil.	R 7.59 mil.	R 737 mil.
Impact on capital formation	R 1,471 mil.	R 18.25 mil.	R 1,489 mil.
Impact on employment [person years]	3,900	67	3,967
Skilled impact on employment [person years]	795	13	808
Semi-skilled impact on employment [person years]	2,319	27	29
Unskilled impact on employment [person years]	787	27	814
Impact on Households	R 480 mil.	R 4.90 mil.	R 485 mil.
Low Income Households	R 77 mil.	R 0.80 mil	R 78 mil.
Medium Income Households	R 90 mil.	R 0.99 mil.	R 91 mil.
High Income Households	R 312 mil.	R 3.11 mil.	R 315 mil.

One of the crucial aspects of any macro-economic assessment is determining how low income households will be impacted.

The construction phase impact on low-income households will be a positive R 39.50 million per annum which translates to 15.1% of the total impact on households' income.

The operational phase impact on low income households will be R 0.41 million per annum which translates to $\pm 16.2\%$ of the total (direct, indirect and induced) operational phase impacts on household income.

Although the project is economically feasible according to the above analysis, the situation around the financial affordability will have to be addressed. It is not only the poverty levels of the recipients of the water but also the possible financial situation of the local authority that must be taken into consideration.

A more comprehensive report on the economic analysis supporting this conclusion is included as a separate volume.

9 ASSESSMENT AND MITIGATION OF RISKS

The major risk is the time that it will take to obtain the various authorisations, to conclude agreements, and to obtain funding. These include:-

- Prepare the application and obtain approval for RBIG funding;
- Prepare the application and obtain approval for water storage and abstraction licences;
- Complete an environmental impact assessment including public consultation and obtain environmental authorisation;
- Obtain council and board resolutions for Ugu DM and Umgeni Water to enter into a WSP agreement and for Umgeni Water to partially fund the project, and to negotiate the details of such an agreement.

A mitigating action would be for the three parties (Ugu DM, Umgeni Water and DWA) to take a number of binding decisions/resolutions very early in the process.

To this effect it must be noted that the only resolution taken to date was on 2 March 2011 (**Appendix D**), when the UGU DM Executive Committee unanimously resolved:

- a) That the report as regards the Ncwabeni off channel storage dam be and is hereby NOTED. (an earlier outline summary of the scheme without funding or institutional arrangements)
- (b) That the construction of the Ncwabeni off channel storage dam be and is hereby APPROVED.

However the composition of the Ugu DM Portfolio Committee has changed substantially and the new Portfolio Committee is still determining their position with regards the dam, the funding of the dam, and the institutional arrangements to develop and operate the dam.

10 **RECOMMENDATIONS**:

The following recommendations are made:

- 1. That Ugu DM be provided with a copy of the final report as approved by DWA.
- 2. That Ugu DM be requested to consider the two options set out in paragraph 6 above and to indicate their preferences and approach.
- 3. That immediately thereafter consultations commence with the participating parties and National Treasury and that an application for RBIG funding and other grant funding be prepared.

11 **REFERENCES**:

- (1) Department of Water Affairs, South Africa, 2012. The role of water boards in rural areas – Present and future. Presentation to Rural Water Workshop held on the 6th March 2012. Prepared by Thamie Mqina.
- (2) **Department of Water Affairs, South Africa, 2010.** *Water Services Regional Bulk Infrastructure Programme – Framework for Implementation.* Version V9c. June 2010.
- (3) Ugu District Municipality, 2012. Integrated Development Plan (IDP) Review (2011/2012). Port Sheptsone.

APPENDIX A: Figures



Figure A1: Location of Ncwabeni and Gugamela off-channel storage dam sites and the St Helen's Rock abstraction



APPENDIX B: Order of Magnitude Financial Calculations

- 1. Input Data
- 2. Water pricing calculations 100% commercial loan, 0% RBIG
- 3. Water pricing Implications 75% commercial loan; 25% RBIG funding
- 4. Water pricing implication 50% commercial loan; 50% RBIG funding
- 5. Government Water Works pricing implications
- 6. Ugu DM Average cost of water sales
- 7. Umgeni Water Tariff

INPUT DATA

Ncwabeni OCS Dam									
FSL		167,5	m3/s						
Pumping rate		0.75	m³/s						
Historic Firm yield		30.50	mcm/a						
		Civil	M&E	Engineering		Maintenance	;	Useful life	
Element		R'000	R'000	Pre enginee	Supervisior	Civil	M&E	Civil	M&E
Ncwabeni Dam +additional 20% global conting	167.5	455 530	24 030	5.00%	10%	0.25%	1%	50	30
Abstraction Works + additional 20% global cor	0.75	37 988	18 703	5.00%	10%	0.25%	4%	50	30
Electricity supply estimate + 20% global contin	gency		18 000	5.00%	10%	0.25%	3%	50	30
Ugu Distribution (funded by Ugu DM through N	IIG)								
Ugu WTW (funded by Ugu DM through MIG)									
Total	554 251	493 518	60 733						

Element		Capital	Annual
		R'000	R'000
Admin cost		20 000	1 000
Environmental cost		7 000	1 000
Social cost		7 000	1 000
Electricity variable	525KW		448
Electricity Fixed			274

Results Dam and off channel works only	Total	6%	8%	10%
	R'000	R/m ³	R/m ³	R/m ³
PV Costs	1 034 262	636 744	576 576	528 983
PV Water	1 398 600	316 716	221 718	162 963
URV	0.74	2.01	2.60	3.25

Tariffs	
Capital cost for Dam	554 251
Capital cost for bulk (assumption)	200 000
Total capital	754 251
Loan redemption tariff 100% loan	R 1.96
Loan redemption tariff 75% loan	R 1.47
Loan redemption tariff 50% loan	R 0.98
DWA Government Water Scheme Tariff -	
dam only	R 1.50
Umgeni average bulk charge currently	R 3.56
Umgeni average charge with100% laon for	
Ncwabeni	R 3.50
Ugu average retail charge currently	R 14.27
Ugu DM average retail charge with 100% loan	
for Ncwabeni	R 16.07

100% Con	nmercial Loan										
	Ncwabeni OCS Dam										
	FSL				167,5	m3/s					
	Pumping rate				0.75	m3/s					
	Historic Firm yield				30.5	mcm/a	1	1		1	
	Bulk water delivered	Dam 2012 costs	Bulk assumption 2012 cc	RBIG	Inflation	Tariff	Revenue	Disbursements	Beginning Year Del	Interest	End Year Debt
				0%	6%	1.96				9.50%	
2012	0.00	0.00	0.00	0.00	1.00	1.96	0	0		0	0
2013	0.00	17 885.02	0.00	0.00	1.06	2.07	0	18 958	C	901	19 859
2014	0.00	23 427.54	0.00	0.00	1.12	2.20	0	26 323	19 859	3 137	49 319
2015	0.00	254 070.53	0.00	0.00	1.19	2.33	0	302 602	49 319	19 059	370 980
2016	0.00	376 005.79	0.00	0.00	1.26	2.47	0	474 699	370 980	57 791	903 470
2017	20.23	6 333.82	0.00	0.00	1.34	2.62	52 964	8 476	903 470	83 716	942 698
2018	20.66	6 340.20	0.00	0.00	1.42	2.78	57 348	8 994	942 698	8 87 259	981 603
2019	21.10	6 346.60	0.00	0.00	1.50	2.94	62 068	9 543	981 603	90 757	1 019 836
2020	21.53	6 352.99	0.00	0.00	1.59	3.12	67 148	10 126	1 019 836	<u>94 176</u>	1 056 989
2021	21.97	6 359.38	0.00	0.00	1.69	3.31	72 614	10 744	1 056 989	97 475	1 092 594
2022	22.40	6 365.78	0.00	0.00	1.79	3.50	78 496	11 400	1 092 594	100 609	1 126 108
2023	22.84	6 372.17	0.00	0.00	1.90	3.71	84 822	12 096	1 126 108	103 526	1 156 908
2024	23.27	6 378.57	0.00	0.00	2.01	3.94	91 625	12 835	1 156 908	106 164	1 184 283
2025	23.71	6 384.97	0.00	0.00	2.13	4.17	98 939	13 619	1 184 283	108 454	1 207 416
2026	24.14	6 391.38	0.00	0.00	2.26	4.42	106 802	14 450	1 207 416	110 318	1 225 383
2027	24.58	6 397.78	0.00	0.00	2.40	4.69	115 252	15 333	1 225 383	111 665	1 237 129
2028	25.01	6 404.19	0.00	0.00	2.54	4.97	124 333	16 269	1 237 129	112 394	1 241 458
2029	25.45	6 410.59	0.00	0.00	2.69	5.27	134 089	17 262	1 241 458	112 389	1 237 021
2030	25.88	6 417.00	0.00	0.00	2.85	5.59	144 569	18 316	1 237 021	111 520	1 222 287
2031	26.32	6 423.41	0.00	0.00	3.03	5.92	155 825	19 435	1 222 287	109 639	1 195 535
2032	26.76	6 429.83	0.00	0.00	3.21	6.28	167 912	20 621	1 195 535	106 580	1 154 825
2033	27.19	6 436.24	0.00	0.00	3.40	6.65	180 889	21 880	1 154 825	5 102 155	1 097 972
2034	27.63	6 442.66	0.00	0.00	3.60	7.05	194 819	23 216	1 097 972	96 156	1 022 525
2035	28.07	6 449.07	0.00	0.00	3.82	7.47	209 770	24 634	1 022 525	88 346	925 734
2036	28.50	6 455.49	0.00	0.00	4.05	7.92	225 814	26 138	925 734	78 460	804 518
2037	28.94	6 461.91	0.00	0.00	4.29	8.40	243 028	27 734	804 518	66 203	655 426
2038	29.38	6 468.32	0.00	0.00	4.55	8.90	261 495	29 427	655 426	51 242	474 600
2039	29.81	6 474.74	0.00	0.00	4.82	9.44	281 303	31 223	474 600	33 208	257 729
2040	30.25	6 4 <mark>81.16</mark>	0.00	0.00	5.11	10.00	302 546	33 130	257 729	11 687	0

75% Com	mercial Loan; 25% RBI	IG									
	Ncwabeni OCS Dam										
	FSL				167,5	m3/s					
	Pumping rate				0.75	m3/s					
	Historic Firm yield				30.5	mcm/a					
	Bulk water delivered	Dam 2012 costs	Bulk assumption 2012 co	RBIG	Inflation	Tariff	Revenue	Disbursements	Beginning Year Del	Interest	End Year Debt
				25%	6%	1.47	,			9.50%	
2012	0.00	0.00	0.00	0.00	1.00	1.47	0	0		0	0
2013	0.00	17 885.02	0.00	4 471.26	1.06	1.56	0	14 219	0	675	14 894
2014	0.00	23 427.54	0.00	5 856.88	1.12	1.65	0	19 742	14 894	2 353	36 989
2015	0.00	254 070.53	0.00	63 517.63	1.19	1.75	0	226 952	36 989	14 294	278 235
2016	0.00	376 005.79	0.00	94 001.45	1.26	1.85	0	356 024	278 235	43 343	677 602
2017	20.23	6 333.82	0.00	1 583.45	1.34	1.96	39 723	6 357	677 602	. 62 787	707 024
2018	20.66	6 340.20	0.00	1 585.05	1.42	2.08	43 011	6 745	707 024	65 445	736 202
2019	21.10	6 346.60	0.00	1 586.65	1.50	2.21	46 551	7 157	736 202	68 068	764 877
2020	21.53	6 352.99	0.00	1 588.25	1.59	2.34	50 361	7 594	764 877	70 632	792 742
2021	21.97	6 359.38	0.00	1 589.85	1.69	2.48	54 461	8 058	792 742	2 73 106	819 445
2022	22.40	6 365.78	0.00	1 591.44	1.79	2.63	58 872	8 550	819 445	5 75 457	844 581
2023	22.84	6 372.17	0.00	1 593.04	1.90	2.79	63 616	9 072	844 581	77 644	867 681
2024	23.27	6 378.57	0.00	1 594.64	2.01	2.95	68 718	9 626	867 681	79 623	888 212
2025	23.71	6 384.97	0.00	1 596.24	2.13	3.13	74 204	10 214	888 212	81 341	905 562
2026	24.14	6 391.38	0.00	1 597.84	2.26	3.32	80 101	10 838	905 562	82 738	919 037
2027	24.58	6 397.78	0.00	1 599.45	2.40	3.52	86 439	11 499	919 037	83 749	927 846
2028	25.01	6 404.19	0.00	1 601.05	2.54	3.73	93 250	12 202	927 846	84 296	931 094
2029	25.45	6 410.59	0.00	1 602.65	2.69	3.95	100 567	12 947	931 094	84 292	927 765
2030	25.88	6 417.00	0.00	1 604.25	2.85	4.19	108 427	13 737	927 765	83 640	916 715
2031	26.32	6 423.41	0.00	1 605.85	3.03	4.44	116 869	14 576	916 715	82 229	896 652
2032	26.76	6 429.83	0.00	1 607.46	3.21	4.71	125 934	15 466	896 652	2 79 935	866 118
2033	27.19	6 436.24	0.00	1 609.06	3.40	4.99	135 667	16 410	866 118	76 617	823 479
2034	27.63	6 442.66	0.00	1 610.66	3.60	5.29	146 115	17 412	823 479	72 117	766 893
2035	28.07	6 449.07	0.00	1 612.27	3.82	5.61	157 328	18 475	766 893	66 259	694 300
2036	28.50	6 4 55.49	0.00	1 613.87	4.05	5.94	169 361	19 603	694 300	58 845	603 388
2037	28.94	6 4 6 1.9 1	0.00	1 615.48	4.29	6.30	182 271	20 800	603 388	49 652	491 569
2038	29.38	6 468.32	0.00	1 617.08	4.55	6.68	196 121	22 070	491 569	38 432	355 950
2039	29.81	6 474.74	0.00	1 618.69	4.82	7.08	210 977	23 418	355 950	24 906	193 297
2040	30.25	6 481.16	0.00	1 620.29	5.11	7.50	226 909	24 847	193 297	8 765	0

50% Com	mercial Loan; 50% RBI	IG									
	Ncwabeni OCS Dam										
	FSL				167,5	m3/s					
	Pumping rate				0.75	m3/s					
	Historic Firm yield				30.5	mcm/a					
	Bulk water delivered	Dam 2012 costs	Bulk assumption 2012 co	RBIG	Inflation	Tariff	Revenue	Disbursements	Beginning Year Del	Interest	End Year Debt
				50%	6%	0.98				9.50%	
2012	0.00	0.00	0.00	0.00	1.00	0.98	0	0		0	0
2013	0.00	17 885.02	0.00	8 942.51	1.06	1.04	0	9 479	0	450	9 929
2014	0.00	23 427.54	0.00	11 713.77	1.12	1.10	0	13 162	9 929	1 568	24 659
2015	0.00	254 070.53	0.00	127 035.26	1.19	1.17	0	151 301	24 659	9 529	185 490
2016	0.00	376 005.79	0.00	188 002.90	1.26	1.24	0	237 349	185 490	28 896	451 735
2017	20.23	6 333.82	0.00	3 166.91	1.34	1.31	26 482	4 238	451 735	41 858	471 349
2018	20.66	6 340.20	0.00	3 170.10	1.42	1.39	28 674	4 497	471 349	43 630	490 802
2019	21.10	6 346.60	0.00	3 173.30	1.50	1.47	31 034	4 771	490 802	45 379	509 918
2020	21.53	6 352.99	0.00	3 176.49	1.59	1.56	33 574	5 063	509 918	47 088	528 495
2021	21.97	6 359.38	0.00	3 179.69	1.69	1.65	36 307	5 372	528 495	48 738	546 297
2022	22.40	6 365.78	0.00	3 182.89	1.79	1.75	39 248	5 700	546 297	50 305	563 054
2023	22.84	6 372.17	0.00	3 186.09	1.90	1.86	42 411	6 048	563 054	51 763	578 454
2024	23.27	6 378.57	0.00	3 189.29	2.01	1.97	45 812	6 417	578 454	53 082	592 141
2025	23.71	6 384.97	0.00	3 192.49	2.13	2.09	49 469	6 809	592 141	54 227	603 708
2026	24.14	6 391.38	0.00	3 195.69	2.26	2.21	53 401	7 225	603 708	55 159	612 692
2027	24.58	6 397.78	0.00	3 198.89	2.40	2.34	57 626	7 666	612 692	55 833	618 564
2028	25.01	6 404.19	0.00	3 202.09	2.54	2.49	62 167	8 134	618 564	56 197	620 729
2029	25.45	6 410.59	0.00	3 205.30	2.69	2.63	67 045	8 631	620 729	56 195	618 510
2030	25.88	6 417.00	0.00	3 208.50	2.85	2.79	72 285	9 158	618 510	55 760	611 144
2031	26.32	6 423.41	0.00	3 211.71	3.03	2.96	77 913	9 717	611 144	54 819	597 768
2032	26.76	6 429.83	0.00	3 214.91	3.21	3.14	83 956	10 311	597 768	53 290	577 412
2033	27.19	6 436.24	0.00	3 218.12	3.40	3.33	90 444	10 940	577 412	51 078	548 986
2034	27.63	6 442.66	0.00	3 221.33	3.60	3.53	97 410	11 608	548 986	48 078	511 262
2035	28.07	6 449.07	0.00	3 224.54	3.82	3.74	104 885	12 317	511 262	44 173	462 867
2036	28.50	6 455.49	0.00	3 227.75	4.05	3.96	112 907	13 069	462 867	39 230	402 259
2037	28.94	6 461.91	0.00	3 230.95	4.29	4.20	121 514	13 867	402 259	33 101	327 713
2038	29.38	6 468.32	0.00	3 234.16	4.55	4.45	130 747	14 713	327 713	25 621	237 300
2039	29.81	6 474.74	0.00	3 237.37	4.82	4.72	140 651	15 612	237 300	16 604	128 865
2040	30.25	6 481.16	0.00	3 240.58	5.11	5.00	151 273	16 565	128 865	5 844	0

Ncwabeni OCS Dam FSL Pumping rate Historic Firm yield

							Total charge		
							inflated		
							(based on		
							revalued		
	Years operational	Civil cost	M&E Cost	ROA	O&M Cost	Inflation	assets)	Water Sold (MCM/a)	Tariff
		Depreciation	Depreciation			6%			R 1.50
2012		10% over 45 years	40% over 30 years	4% p.a.		1.00			
2013						1.06			
2014						1.12			
2015						1.19			
2016						1.26			
2017	1	1 097	810	22 170	6 334	1.34	R 40 696	20.23	R 2.01
2018	2	1 097	810	22 170	6 340	1.42	R 43 147	20.66	R 2.09
2019	3	1 097	810	22 170	6 347	1.50	R 45 745	21.10	R 2.17
2020	4	1 097	810	22 170	6 353	1.59	R 48 500	21.53	R 2.25
2021	5	1 097	810	22 170	6 359	1.69	R 51 421	21.97	R 2.34
2022	6	1 097	810	22 170	6 366	1.79	R 54 518	22.40	R 2.43
2023	7	1 097	810	22 170	6 372	1.90	R 57 801	22.84	R 2.53
2024	8	1 097	810	22 170	6 379	2.01	R 61 282	23.27	R 2.63
2025	9	1 097	810	22 170	6 385	2.13	R 64 972	23.71	R 2.74
2026	10	1 097	810	22 170	6 391	2.26	R 68 885	24.14	R 2.85
2027	11	1 097	810	22 170	6 398	2.40	R 73 033	24.58	R 2.97
2028	12	1 097	810	22 170	6 404	2.54	R 77 432	25.01	R 3.10
2029	13	1 097	810	22 170	6 411	2.69	R 82 095	25.45	R 3.23
2030	14	1 097	810	22 170	6 417	2.85	R 87 039	25.88	R 3.36
2031	15	1 097	810	22 170	6 423	3.03	R 92 281	26.32	R 3.51
2032	16	1 097	810	22 170	6 430	3.21	R 97 838	26.76	R 3.66
2033	17	1 097	810	22 170	6 436	3.40	R 103 730	27.19	R 3.81
2034	18	1 097	810	22 170	6 443	3.60	R 109 977	27.63	R 3.98
2035	19	1 097	810	22 170	6 449	3.82	R 116 600	28.07	R 4.15
2036	20	1 097	810	22 170	6 455	4.05	R 123 622	28.50	R 4.34
2037	21	1 097	810	22 170	6 462	4.29	R 131 067	28.94	R 4.53
2038	22	1 097	810	22 170	6 468	4.55	R 138 960	29.38	R 4.73
2039	23	1 097	810	22 170	6 475	4.82	R 147 329	29.81	R 4.94
2040	24	1 097	810	22 170	6 481	5.11	R 156 201	30.25	R 5.16

167,5

	Actual 2011				
	2011				
UGU DM					
STATUS QUO					
All water and sanitation service charges	313 548				
Projected water consumption used in Ugu tariff calc (kl'000)	21 968				
Average service charge per KL - incl fixed charges	R 14.27				
SCENARIO IF NCWABENI DAM ADDED AT CURRENT COSTS (no additional subsidies/transfers and current sales)					
Current Service charges	313 548				
Ncwabeni charges (100% Loan)	39578				
Total Service charges	353 126				
0					

Projected consumption used in Ugu tariff calc (KL'000)	21 968
Required average service charge per KL - incl fixed charges	R 16.07

Increase in average service charges per KL	R 1.80
increase in average service charges per ite	111.00

Note: Umzimkhulu RWSS is already included in Ugu DM area of supply.

UGU BUDGET FROM WHICH FIGURES WERE OBTAINED

	R'000		Actual		Projected			
	2008	2009	2010	2011	2012	2013	2014	
Other Revenue (transfers/grants etc)	244 175	465 172	592 006	247 407	303 817	319 008	334 956	
Service charges	185 745	201 995	245 729	313 548	391 114	410 669	431 205	
Total Revenue - standard	429 920	667 167	837 735	560 955	694 931	729 677	766 161	
Expenditure								
Governance and Administration	109 604	165 425	122 184	128 811	158 515	186 440	174 762	
Safety, economic services, other	50 583	122 980	170 531	83 957	-113 809	72 736	67 341	
Water	223 154	300 994	310 907	270 905	567 697	386 052	435 386	
Waste Water	45 290	58 142	47 449	46 078	68 414	69 735	73 222	
Total Expenditure	428 631	647 541	651 071	529 751	680 817	714 963	750 711	
Surplus	1 289	19 626	186 664	31 204	14 114	14 714	15 450	

UMGENI WATER

	Projected	
	2011	2012
STATUS QUO		
Bilk water charges	1 422 120	1 506 646
Bulk water sales (kl'000)	414 579	422 871
Average bulk water charge per KL	R 3.43	R 3.56

SCENARIO IF NCWABENI DAM ADDED AT CURRENT COSTS (and no additional subsidies/transfers and current sales)

Current bulk charges	1 506 646
Ncwabeni charges (100% Loan)	39 578
Total charges	1 546 224
Current water sales	422 871
Ncwabeni Sales	19 201
Total water sales	442 071
Average bulk charges per KL with Umgeni	R 3.50
Increase in average service charges per KL	-R 0.07

UMGENI BUDGET FROM WHICH FIGURES WERE OBTAINED

	R'000	000 Projected					
	2008	2009	2010	2011	2012	2013	2014
Other Revenue (raw water, waste water)	89 949	226 309	248 596	261 096	346 484	112 722	121 593
Bulk Water Charges	1 190 798	1 259 187	1 373 784	1 422 120	1 506 646	1 587 960	1 697 677
Total Revenue - standard	1 280 747	1 485 496	1 622 380	1 683 216	1 853 130	1 700 682	1 819 270
Expenditure							
Cost of Sales	393 265	545 025	620 857	700 409	836 951	692 809	758 061
Admin Expenses	337 680	329 163	389 186	492 584	452 545	519 274	557 817
Net interest and finance charges	165 439	116 496	80 076	51 781	64 936	60 569	64 363
Total Expenditure	896 384	990 684	1 090 119	1 244 774	1 354 432	1 272 652	1 380 241
Surplus excl other operaring income	384 363	494 812	532 261	438 442	498 698	428 030	439 029

APPENDIX C: Extracts from National Water Act

17 Preliminary determinations of Reserve

(1) Until a system for classifying water resources has been prescribed or a class of a water resource has been determined, the Minister-

- (a) may, for all or part of a water resource; and
- (b) must, before authorising the use of water under section 22 (5),

make a preliminary determination of the Reserve.

21 Water use

For the purposes of this Act, water use includes-

- (a) taking water from a water resource;
- (b) storing water;
- (c) impeding or diverting the flow of water in a watercourse;
- (d)

27 Considerations for issue of general authorisations and licences

(1) In issuing a general authorisation or licence a responsible authority must take into account all relevant factors, including-

- (a) existing lawful water uses;
- (b) the need to redress the results of past racial and gender discrimination;
- (c) efficient and beneficial use of water in the public interest;
- (d) the socio-economic impact-
- (i) of the water use or uses if authorised; or
- (ii) of the failure to authorise the water use or uses;
- (e) any catchment management strategy applicable to the relevant water resource;
- (f) the likely effect of the water use to be authorised on the water resource and on other

water users;

- (g) the class and the resource quality objectives of the water resource;
- (h) investments already made and to be made by the water user in respect of the water use in question;
 - (i) the strategic importance of the water use to be authorised;
 - (j) the quality of water in the water resource which may be required for the Reserve and for

meeting international obligations; and

the probable duration of any undertaking for which a water use is to be authorised.

(2)

(k)

28 Essential requirements of licences

(1) A licence must specify-

- (a) the water use or uses for which it is issued;
- (b) the property or area in respect of which it is issued;
- (c) the person to whom it is issued;
- (d) the conditions subject to which it is issued;
- (e) the licence period, which may not exceed forty years; and
- (f) the review periods during which the licence may be reviewed under section 49, which must be at intervals of not more than five years.

40 Application for licence

(1) A person who is required or wishes to obtain a licence to use water must apply to the relevant responsible authority for a licence.

(2)

CHAPTER 12 SAFETY OF DAMS (ss 117-123)

117 Definitions

In this Chapter-

(a) 'approved professional person' means a person registered in terms of the Engineering Profession of South Africa Act, 1990 (Act 114 of 1990), and approved by the Minister after consultation with the Engineering Council of South Africa (established by section 2 of that Act);

(b) 'dam' includes any existing or proposed structure which is capable of containing, storing or impounding water (including temporary impoundment or storage), whether that water contains any substance or not;

(c) 'dam with a safety risk' means any dam-

(i) which can contain, store or dam more than 50 000 cubic metres of water, whether that water contains any substance or not, and which has a wall of a vertical height of more than five metres, measured as the vertical difference between the lowest downstream ground elevation on the outside of the dam wall and the non-overspill crest level or the general top level of the dam wall;

(ii)

118 Control measures for dam with safety risk

(1) The owner of a dam must-

(a) within the period specified, provide the Minister with any information, drawings, specifications, design assumptions, calculations, documents and test results requested by the Minister; or

(b) give any person authorised by the Minister access to that dam, to enable the Minister to determine whether-

(i) that dam is a dam with a safety risk;

(ii)

120 Registration of dam with safety risk

(1) The owner of a dam with a safety risk must register that dam.

(2) An application for registration must be made within 120 days-

(a) after the date on which the dam with a safety risk becomes capable of containing, storing or impounding water......

APPENDIX D: Ugu DM Resolution

UGU DISTRICT MUNICIPALITY

EXTRACT FROM THE DRAFT MINUTES OF THE EXECUTIVE COMMITTEE MEETING HELD ON 02 MARCH 2011

EXCO 63/03/11 Ncwabeni Off Channel Storage Dam

The Mayor took members through this item.

He apprised the Committee that the Ncwabeni off channel storage dam was to be constructed in the Oribi Gorge Area.

He emphasised that the purpose of this dam was to supplement water supply to the Bhobhoyi Water Treatment Works.

Following which,

It was unanimously

RESOLVED:

- (a) That the report as regards the Ncwabeni off channel storage dam be and is hereby **NOTED**.
- (b) That the construction of the Ncwabeni off channel storage dam be and is hereby **APPROVED**.

CERTIFIED A TRUE COPY OF THE ORIGINAL

MS P P NTEBE GENERAL MANAGER: CORPORATE SERVICES