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THE INVESTIGATION INTO ESTABLISHING AN INTERNAL
WATER SERVICES PROVISION STRUCTURE FOR THE UMDM,
AS A WATER SERVICES AUTHORITY, USING THE
REENGINEERING PROCESS.

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EXECUTIVE SUMMARY

1 **BACKGROUND:**

As the title of this dissertation purports, the aspects covered in this report are those required of the reengineering processes, required for the establishment of a new departmental or organisational function. This function of water services provision has in the past, been provided by external service providers, namely the current local municipalities, who prior to 1 July 2003 were providing the water services provision to the then Transitional Local Councils. After 1 July 2003 agreed to provide water services to the entire local municipality area within its boundary including the rural areas, which they had not serviced in the past. This agreement to service these areas on behalf of the uMgungundlovu District Municipality (uMDM) has been active for the interim period since 1 July 2003 and will terminate on finalisation of the establishment of the proposed Water services provision unit as is proposed to be internally provided by the uMDM.

The reengineering process as mentioned is the process that is to be followed to restructure and capacitate the uMDM so as to enable the municipality to take over this water services provision function.

As the uMDM is financially strong and has the vision of “*evolving into a dynamic Metropolitan area, spreading its vibrant economic benefits to all its citizens and places and will, through concerted integrated development and service delivery, realise improvements in the overall quality of life*”, (uMDM IDP, p29) it was believed in the best interests of the uMDM to provide the water service provision function itself.

To be able to provide this service utilising the internal option as provided for in section 78(2)(a) of the systems act, act 32 of 2000, the uMDM had to undergo a reengineering of its organisational structure and systems. This dissertation’s purpose was to investigate the processes to be followed in the reengineering of the organisation to be able to provide the water service provision function adequately in terms of all regulations, political and customer expectations.

2 REVIEW OF THE THEORETICAL LITERATURE FOR THE REENGINEERING OF A CUSTOMER SERVICE ORGANISATION

The researcher began the investigation by developing a theoretical model framework that was believed to be a best fit for the provision function, with the processes identified that required reengineering being the organisational structure and the information and reporting systems.

In the theoretical review chapter of this report the principles of a good organisational structure for the operations environment was investigated and various principles extracted to be applied later in the process, in terms of the affect of different organisational structure configurations; the influence of technology; organisational culture; social design; networks; lines of communication and some other issues, on the proposed development of the organisational structure.

Included in the theoretical literature review were the investigations into the technical operational system requirements, which included the proposed telemetry system, operations reporting system and some important principles were extracted.

An analysis on the functioning of a supply chain management system, which included inventory management was performed and an investigation into the information technology systems that are appropriate for the financial environment. The requirements of a billing and debtors control information technology system was further investigated indicating what controls would have to be provided for, in any finance software package that will have to be procured and installed for the uMDM.

As to be able to provide a suitable provision there is a requirement to produce a number of policies and therefore some theoretical understanding of policy formulation was provided in this theoretical literature review chapter.

As the scope of this dissertation did not include for actual policy development no further work was performed of the policy formulation aspect of establishing the water services provision function other than what is provided in the theoretical literature review, even though it would still have to be performed in practice.

3 REVIEW OF THE CONTEXTUAL LITERATURE FOR THE REENGINEERING OF A CUSTOMER SERVICE ORGANISATION

The contextual information that was available was that of Government legislation; the Section 78 assessment that was performed in terms of the Systems Act, Act No. 32 of 2000; the investigations that are being performed for the provision into the Enterprise Resource Planning (ERP) / Finance System by external consultants; the peer review report on the uMDM / WSA; the investigation report performed on the proposed telemetry system required for the uMDM; the investigations into the acquisition of the operations reporting system; and the information provided on the information technology network requirements of the uMDM.

3.1. LEGISLATIVE REQUIREMENTS

Various legislation was interrogated and the most appropriate sections and sub sections extracted and provided in this report. It was necessary to provide some founding to substantiate the requirement to provide a structure and technological systems, which will assist the uMDM to appropriately meet its obligations in terms of the legislation and provide good customer service.

The statutory requirements that were referred to were the Municipal Structures Act, No. 117 of 1998; the Systems Act No. 32 of 2000; the Water Services Act No. 108 of 1997; the Compulsory National Standards under Section 9(1) of the Water Services Act, No. 108 of 1997); the Public Finance Management Act, 1999 (Act No. 1 of 1999 as amended by Act 29 of 1999); Regulations in terms of the Public Finance Management Act, 1999: Framework for Supply Chain Management and lastly the Municipal Finance Management Act, 2003 (Act No. 56 of 2003), which were all applicable for mentioning in this dissertation.

3.2. REVIEW OF THE SECTION 78 ASSESSMENT

An in-depth analysis had been performed by external consultants on the status quo of the local municipalities within the uMDM and the uMDM concerning the ability of the municipalities to perform a water services provision function. The assessment analysed the municipalities in terms of their technical, financial and institutional abilities and

provided a recommendation as to what type of mechanism the uMDM should be establishing for the provision of the water and sanitation services.

The findings of the assessment can be summarised in the table as follows:

SUMMARY OF THE INTERNAL ASSESSMENT OF THE WSP (UWP (2004b), Section 4 p.32).

MUNICIPALITY	FUNCTION		
	Technical	Financial	Institutional
uMshwathi	V	X	X
uMngeni	V	V	V
Mooi Mpofana	X	X	X
Impendle	X	X	X
Mkhambathini	X	X	X
Richmond	V	V	V
uMDM	X	V	X

Likely Ability of the WSP's to fulfill the role of WSP (v = likely; x= unlikely)

As can be deduced from this summary the uMngeni and the Richmond local municipalities are the only municipalities that have sufficient capacity to provide the WSP function when considering the technical, financial and institutional aspects. It must be noted that the uMDM were regarded as being financially capable of performing the function.

3.3. REVIEW OF THE INVESTIGATIONS INTO THE ENTERPRISE RESOURCE PLANNING (ERP) / FINANCE SYSTEM.

The uMDM are currently completing an investigation into the procurement of an ERP / finance system, which will be utilised by the WSPU. Investigations were performed on processes that are followed in the functioning of the finance department, and what systems are currently been utilised at all the municipalities.

The process assessed were the registration, invoicing, receipting, day-end procedures, outstanding debtors, disconnections and account queries procedures (Deloitte, p.4).

From the investigations it was determined that all the municipalities use different financial systems and it is felt that the entire district should standardise on one financial system which possesses all the requirements of the uMDM. The following financial systems were found to be in operation at the municipalities:

FINANCIAL SYSTEMS UTILISED BY THE MUNICIPALITIES (Deloitte, p.6)

MUNICIPALITY	FINANCIAL SYSTEM				
	ABACUS	DOLPHIN	VENUS	SAMRAS	BEKKER
Mpofana			X		
uMshwathi		X			
Richmond	X				
Mkhambathini	X				
uMngeni				X	
Impendle	X				
UMDM					X

The appointed consultants are currently finalising their investigations and will be developing a specification for which suppliers will be requested to provide a tender.

The further investigation into the establishment of the finance system for the uMDM is not included in the scope of this dissertation. It must however be noted that the uMDM have utilised the services of the State Information Technology Agency (SITA) as provided for in the legislation, and as highlighted in the legislative section of the contextual literature review.

3.4. REVIEW OF THE UMGUNGUNDLOVU PEER REVIEW REPORT

On the 16th and 17th of February 2006 the uMDM WSA hosted a “Peer review session”, where the uMDM was reviewed by a number of District municipalities that have a similar environment to that of the uMDM, and other stakeholders namely the Water research commission (WRC), the Department of water affairs and forestry (DWAf), the Department of local government and Mvula trust. The uMDM was reviewed in terms of its institutional perspective; financial perspective; strategic asset management; and

service standards and valuable feedback was given in terms of general observations, strengths, challenges and recommendations.

The feedback received assisted in making adjustments to the procedures that were being followed and gave more insight into what the uMDM should be taking cognizance of in the establishment of a WSPU.

3.5. REVIEW OF THE INVESTIGATIONS ON THE INFORMATION TECHNOLOGY SYSTEMS

There are two information technology systems that are proposed for the proposed WSPU, the telemetry system and the operations reporting system. It was further acknowledged that an asset management system would be required which has not been investigated in this report but should be performed and an asset management system procured for the uMDM.

From the investigations performed on what telemetry systems are required by the uMDM it was resolved in the report provided by the external consultant that three types of systems be utilised for the telemetry system namely a Radio Frequency (RF) system, a Global System for Mobile Communications (GSM) system, and a General Packet Radio Service (GPRS) system. All these three systems are required for various applications and circumstances (Business Connection (2006), p.22).

The uMDM was fortunate to be given the operations reporting system from eThekweni water. It was still necessary to ensure that this system namely the "Faultman" system was suitable for the uMDM and therefore a feasibility analysis was performed in the way of a "TELOS" feasibility analysis. The result of the "TELOS" analysis was a final score of an 83% feasibility, which concluded that the "Faultman" system was suitable for utilisation by the uMDM.

There has been an extensive investigation that has been performed by the IT services department of the network that is required for the establishment of the WSPU. It is proposed that a wide area network (WAN) be established for the uMDM, which will link up all the local municipalities and the water offices that are located out in the rural areas to the uMDM and each other. An analysis on the cost savings of utilising a Virtual

Private Network (VPN) was performed and found to be cheaper than other options for what services and security the VPN is able to provide. There are a number of benefits that will be received by utilising a VPN as highlighted in the text. It will also be utilised for the provision of services to the local municipalities for functions other than the WSPU.

4 DEVELOPMENT OF A MODEL FRAMEWORK

To be able to develop a framework in terms of an organisational structure and the information technology systems required it was necessary to complete the theoretical and contextual literature review and extract important principles from the literature and the investigations that were performed.

From the above information a number of principles and points were listed in terms of both the requirements of organisational structure for the operational environment and technical information systems, which were used to develop the model organisational structure as is provided in Appendix B of this report.

In addition to the organisational structure framework, an understanding of the telemetry system and of the “Faultman” operational reporting system proposed for the adoption by the uMDM for the WSPU was provided. An understanding was further provided as to what information technology network system has been proposed for the uMDM.

This information formed the basis for the comparison and performance of a “SWOT” analysis on the current organisational structures and technical systems utilised in the local municipalities, within the uMDM, excluding the uMsundusi Local Municipality which is a WSA in their own right.

An explanation was further given on the reengineering rollout programme that was necessary for any reengineering initiative. The uMDM in their task to establish a WSPU developed a rollout programme that included a comprehensive list of activities and timelines, which is attached in Appendix C of this dissertation. This programme was utilised as the model programme and adjusted to produce a more realistic programme.

5 ANALYSIS AND FINDINGS

5.1 CURRENT VERSES THE PROPOSED STAFF COMPLEMENT

In section 5.1, the existing organisational structures of all the municipalities in the uMDM including the structure of the uMDM were compared to the framework organisational structure that was developed from the findings in the previous chapter. It was found that most of the municipalities had very few personnel and it was established that the uMDM will have to employ a number of additional staff in the immediate and short term.

The summary of the comparison was as follows:

FINAL PROPOSAL FOR THE STAFFING REQUIREMENTS OF THE WSPU

SUMMARY OF THE FINDINGS OF THE COMPARISON BETWEEN THE CURRENT AND THE PROPOSED ORGANISATIONAL STRUCTURES					
WATER SERVICES PROVISION UNIT, BUSINESS UNITS	No. OF POSTS REQUIRED	POST AVAILABLE AND OCCUPIED	POST TO BE CREATED	CRITICAL POSTS REQUIRED	POSTS REQUIRED IN SHORT TERM
UMSHWATHI MUNICIPAL AREA	111	40	71	21	50
UMNGENI MUNICIPAL AREA	70	22	48	17	31
MPOFANA MUNICIPAL AREA	57	23	34	14	20
IMPENDLE MUNICIPAL AREA	49	7	42	13	29
MKHAMBATHINI MUNICIPAL AREA	74	29	45	9	36
RICHMOND MUNICIPAL AREA	68	33	35	12	23
UMDM HEAD OFFICE	56	20	36	30	6
TOTALS	485	174	311	116	195
PERCENTAGE OF REQUIRED POST	100%	36%	64%	24%	40%

5.2 FINANCIAL CONSIDERATIONS

A financial analysis was performed on what it would cost to establish the WSPU. Taking all the estimated costs, total revenue expected to be receive and the expected equitable share allocation to be provided into consideration, it was possible to calculate

what the tariff is expected to be set at for the provision of this service when utilising the structures and systems previously developed in this paper.

The calculated rate of R7,55 per kilolitre in the immediate term and the increase to R7,80 per kilolitre to cater for the provision of services to the entire uMDM population with a minimum of Reconstruction and Development Programme (RDP) level of service is in the opinion of the researcher acceptable. These tariffs provide for unaccounted for water provisions that are normal for the rural and urban environments, which is expected to be reduced, and which will therefore reduce the costs for the provision of the service. With good social interventions it will also be expected that the payment for water will be improved in the future, which will also improve the financial situation.

The uMDM's ability to succeed in this WSPU function depends heavily on the allocation of a substantial portion of the equitable share to this function and it will be necessary to receive commitment from the uMDM council on this matter before any further developments into the process of establishment is effected. It is necessary that approximately R60 million of the equitable share is allocated to the water and sanitation function per annum.

6 ANALYSIS OF THE RESULTS OF THE INTERVIEWS

With the development of the frameworks in terms of organisational structure and information technology systems, it was necessary to interview various Technical managers of the local municipalities who would be able to provide professional comment and assist in improving the model structure that had been produced.

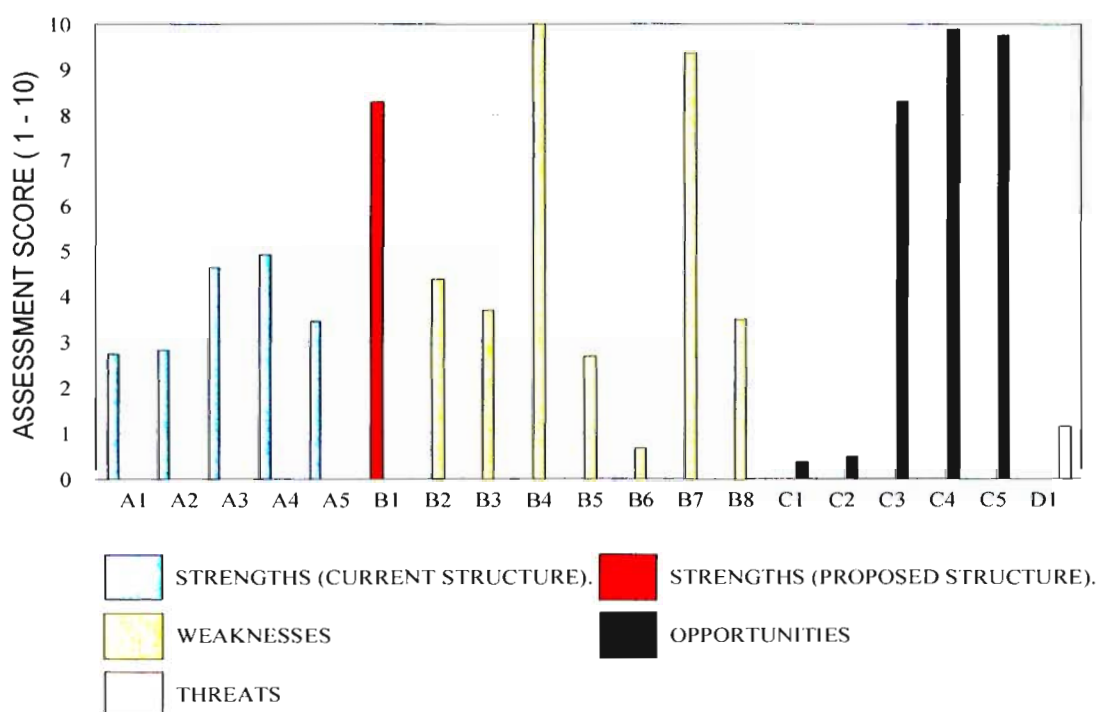
The members of the uMDM reengineering team were interviewed and their comments received on the reengineering rollout programme, the concerns with the process followed and other issues.

The responses to the questionnaires and the model framework were analysed and utilised for the improvement of the model organisational structure.

A diagrammatic representation of the results received from the questionnaires is as provided in Table 20 of this report and is as provided below for ease of reference.

Summary of the investigations of the current versus the proposed institutional arrangements and operational aspects of the Local municipalities.

INVESTIGATIONS OF THE CURRENT & PROPOSED INSTITUTIONAL & OPERATIONAL ASPECTS



The labels as referred to on the “X” axis of the above graph refer to that as provided in legend below.

LABEL	DESCRIPTION	LABEL	DESCRIPTION
STRENGTHS (CURRENT STRUCTURE)		B5	Plant, equipment and materials Average
A1	Current Structure	B6	Proposed Structure Average
A2	Infrastructure	B7	Reporting Information Systems Average
A3	Operations	B8	Technical Information systems Average
A4	Plant, equipment and materials	OPPORTUNITIES	
A5	Technical Information systems	C1	Current Structure Average
STRENGTHS (PROPOSED STRUCTURE)		C2	Operations Average
B1	Proposed Structure Average	C3	Proposed Structure Average
WEAKNESSES		C4	Reporting Information Systems Average
B2	Current Structure Average	C5	Technical Information systems Average
B3	Infrastructure Average	THREATS	
B4	Operations Average	D1	Infrastructure Average

Description of the labels utilised in the figure above which summarises the

investigations of the Current verses the proposed institutional arrangements and operational aspects of the Local municipalities.

The summary of the actual results received from the questionnaires can be views in Appendix F of this report.

The reengineering team that was tasked with establishing the WSPU for the uMDM were interviewed and their comments solicited on the implementation rollout plan as provided in Appendix C of this report. The implementation programme was adjusted in terms of the comments received and a revised implementation plan was provided in Appendix H of this report.

A further analysis was performed on the uMDM in terms of a “SWOT” analysis to assess the uMDM’s ability to provide the WSPU function.

7. CONCLUSIONS

From the investigation it was concluded that generally the current municipalities are under capacitated in terms of human resources, plant, machinery and equipment, neither do the municipalities have adequate organisational structures developed for the water and sanitation provision function. In terms of information technology systems, the municipalities are very limited and do not utilise operational information reporting systems. It is acknowledged that the investigations as performed by the external services providers in the production of the section 78 assessment was correct and the provisions of the summary of the internal assessment of the municipalities as provided in Table 7 in this report, is supported.

The organisational structure as developed from the literature review of this dissertation was considered as being appropriate by the majority of the interviewee’s however a couple of the interviewee’s gave good profession insight and suggested some further modifications which were agreed to by the researcher as they were logical and were supported by the literature review.

7.1 REVISIONS OF THE ORGANISATIONAL STRUCTURE

As commented on by various representatives who were interviewed, the following was

agreed to by the researcher and therefore he has decided to make the following revisions to the model framework as initially developed:

- 7.1.1 In some cases it may not be advisable to define the rural and urban / peri-urban components of the organisational structure as separate entities.
- 7.1.2 It was believed that there should not be a distinct separation between the water and sanitation reticulation functions, but that they should be merged and represented as one function.
- 7.1.3 It was believed that not sufficient number of Institutional Social Development offices had been provided.
- 7.1.4 It was agreed that not sufficient administration support officials existed in the structure and that a financial controller is required.
- 7.1.5 There was agreement in the change in the numbers of staff that were required, some increase and some decrease in the numbers of staff.

The revised staffing numbers and proposed organisational structures are as provided in Appendix G of this report.

7.2 REVISIONS OF THE COST ANALYSIS

As there were no significant changes in the administration costs the parameter utilised for the cost analysis were unchanged and remain as provided in Table's 24 and 25 of this report.

7.3 ADOPTION OF THE INFORMATION AND FAULT REPORTING SYSTEMS

It is concluded that all of the three types of telemetry systems are required, namely the Radio Frequency (RF) system, a Global System for Mobile Communications (GSM) system, and a General Packet Radio Service (GPRS) system.

It is further concluded that the "Faultman" operations reporting system should be adopted by the uMDM as the reporting system, which could be further developed as and when required.

7.4 ADOPTION OF THE WIDE AREA NETWORK FOR THE UMDM

Following the investigations that have been performed it was concluded that due to the

changes in the sphere of government and especially as the uMDM is forced to review its long term information and communication technology (ITC) strategies to accommodate the new technological demands, it will have to provide an Information technology (IT) infrastructure that will be able to successfully cater for this.

As a result of the challenges mentioned it was concluded that due to the requirement of a high level of security, the uMDM should adopt the option of providing direct link to a Virtual private network.

7.5 CRITICAL FACTORS TO BE TAKEN INTO CONSIDERATION WHEN ESTABLISHING A SIMILAR WATER SERVICE PROVISION UNIT.

It was recommended that anyone who engages in a similar reengineering exercise must take cognizance of the following critical factors as provided below.

- 7.5.1** It is required that political buy in is obtained for the reengineering process at the outset.
- 7.5.2** When one develops a programme it must be designed with appropriate time lines, preferably within twelve months.
- 7.5.3** The top management of the organisation must demonstrate their support and own the process.
- 7.5.4** It is considered imperative that a sub committee of the executive structures be formed and assigned for the oversight of the development.
- 7.5.5** The process must be budgeted for, before the establishment process is embarked upon and full commitment received from the financial services department and council on this matter.
- 7.5.6** The reengineering team must be well represented by all departments and affected stakeholders. Union representation is essential.
- 7.5.7** There should be backup staff available, who are aware of the progress that is being made and who can substitute a member of his/her department who may become unable to continue with the process.
- 7.5.8** A strong facilitator is required to facilitate the reengineering team, one who can lead and follow.
- 7.5.9** Communication with stakeholders is essential.

- 7.5.10** Regular meetings between the representatives of the reengineering team are required where feedback and new direction can be given.
- 7.5.11** On average the team must jointly spend more than 50% of their employment time on the programme, with at least one fully committed employee.
- 7.5.12** The team members should communicate with service providers and other organisations that have performed similar operations and who have the technical know-how.
- 7.5.13** The team representatives must focus on achieving the high priority tasks that are on the programme and continually be guided by this establishment programme to complete all the tasks that are provided for.

7 RECOMMENDATIONS

An overview of the recommendations required for actioning, for the successful establishment and operation of the WSPU by the uMDM are that the uMDM must:

- approve the Water Services organisational structure as provided in Appendix G of this dissertation;
- provide the required resources in terms of suitably qualified personnel appointed to the posts as provided in Appendix G as recommended above;
- only transfer the staff that are working for the current WSP's, on water and sanitation infrastructure, once the operational systems have been installed and the organisations structure has been adopted;
- Ensure that authority is decentralised to where the work is performed at decentralised business units;
- Establish Service Level Agreements between the WSPU and other departments namely the Financial Services Department, WSA section and other departments;
- provide the information technology infrastructure, information and operational systems as concluded in terms of the recommendations of this report;
- commit the required amount of the Equitable Share, which from the calculations in this report amounted to approximately 45% of the entire equitable share or approximately R60 million per annum, to the water services provision function;
- monitor the financial situation and performance of the WSPU utilising the indices and financial ratio's as provided in the above recommendations;
- abide to the legislative requirements of Section 79(a) of the Systems Act No. 32 of 2000. that states that if a municipality decides to provide a municipal service

through an internal mechanism mentioned in section 76(a), it must a) allocate sufficient human, financial and other resources necessary for the proper provision of the service; and b) transform the provision of that service in accordance with the requirements of this Act (Republic of South Africa, 2000, p.74).

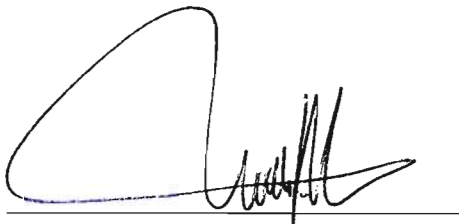
- pursue the proclamation of Metropolitan status and take advantage of the increase in the revenue base and economies of scale;
- strive to complete the reengineering process as quickly as possible;
- utilise this dissertation and the rollout programme as provided in Appendix H as a guide for the WSPU establishment;
- ensure that cognizance is taken of the critical factors as provided in the recommendations and that they are followed.

It is further recommended that should another WSA want to utilise this dissertation and the rollout programme as provided in Appendix H as a guide for a reengineering exercise that they are performing then they must acknowledge the environment and the vision in which this dissertation was developed and make modifications where appropriate to suit their own environment. This dissertation must not be seen as a general guide to be followed in all environments.

DECLARATION

The author, Michael John Wells, hereby states that all the research work in this dissertation, unless otherwise stated, was initiated by him and that he was solely responsible for the planning, analysis and reporting of the findings and conclusions. This work has not been submitted in part or in whole to any other University.

The research was carried out in KwaZulu-Natal, under the supervision of Mr Dave Nozaic.

A handwritten signature in blue ink, appearing to read 'M. J. Wells', is written over a horizontal line.

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ACRONYMS AND ABBREVIATIONS

ADSL	-	Analog / Digital subscriber line
BPR	-	Business Process re-engineering
DM	-	District Municipality
DM's	-	District Municipalities
DMZ	-	Demilitarized zone
DWAF	-	Department of Water Affairs and Forestry
DWSMF	-	District Water Services Management Forum
ERP	-	Enterprise Resource Planning
GAMAP	-	Generally Accepted Municipal Accounting Practice
GIS	-	Geographical Information System
GPRS	-	General Packet Radio Service
GSM	-	Global System for Mobile Communications
IP	-	Internet Protocol
ISD	-	Institutional Social Development
KPIs	-	Key Performance Indicator's
LM	-	Local Municipality
MFMA	-	Municipal Finance Management Act, 2003 (Act No. 56 of 2003)
O&M	-	Operations and Management
PFMA	-	Provincial Finance Management Act, 1999 (Act No. 1 of 1999 as amended by Act 29 of 1999)
PMU	-	Project Management Unit
RAWSP	-	Rural Areas Water & Sanitation Programme
RDP	-	Reconstruction and Development Programme
RF	-	Radio Frequency
RSA	-	Republic of South Africa
SAAS	-	South African Auditing Standards
SAAPS	-	South African Auditing Practice Statements
SANS	-	South African National Standards
SCADA	-	Supervisory Control and Data Acquisition
SCOR	-	Supply chain operations reference
SEM	-	Strategic Executive Manager

SITA	-	State Information Technology Agency
SMS	-	Short message service
SMTP	-	Simple mail transport protocol
SWOT	-	Strengths, Weaknesses, Opportunities & Threats
TELOS	-	Technical, Economical, Legal, Operational, Scheduled
TLC	-	Transitional Local Council
USA	-	United States of America
VAT	-	Value Added Tax
VIP	-	Ventilated Improved Toilet
VPN	-	Virtual Private Network
WAN	-	Wide Area Network
WRC	-	Water Research Commission of South Africa
WSA	-	Water Services Authority
WSP	-	Water Services Provider
WSPU	-	Water Services Provision Unit

CHAPTER ONE

1 INTRODUCTION

A new governmental dispensation arose in the Republic of South Africa (RSA) in 1994 when the African National Congress was democratically voted into power by the majority of the RSA citizens. Prior to 1994 the country was governed by the National Party which discriminated on racial lines, with the majority of the country's citizens having access to below-acceptable standards of services and specifically in terms of this report, water and sanitation provision services. This discrimination occurred predominantly in the rural areas of the country where very little infrastructural development existed.

The Republic of South African (RSA) Constitution, Act 108 of 1996 states in section 27(1)(b) that everyone has the right to have access to sufficient food and water and in section 27(2) The state must take reasonable legislative and other measures within its available resources, to achieve the progressive realisation of each of these rights (Republic of South Africa, 1996).

From this provision the Water Service Act, Act 108 of 1997 continued to enforce the Constitution in section 3. (1) where it states that "Everyone has a right of access to basic water supply and basic sanitation" (Republic of South Africa, 1997, p.12).

The Municipal Structures Act No 117 of 1998 was promulgated to address Local Government structures. Municipalities were established in accordance with the requirements relating to categories and types of municipalities and the appropriate division of functions and powers were assigned to the municipalities. The relevant structures were put in place to practically ensure compliance with the above legislation and meet the challenge of addressing the enormous services backlog (Republic of South Africa, 1998a, p.18).

The Municipal Systems Act No. 32 of 2000 was promulgated to ensure the progressive development and establishment of systems within Local government which will aid in the economic upliftment and provision of affordable essential

services to local communities (Republic of South Africa, 1998b, p.2).

Prior to the promulgation of the Municipal Systems Act No. 32 of 2000 and the Municipal Structures Acts No. 117 of 1998 in the RSA, the infrastructure that was constructed in the rural areas of the country was largely handed over to the communities to manage, operate and maintain with no real post construction services provision offered to the communities. The infrastructure was in some cases vandalised or required normal maintenance, with no one actually taking ownership of the infrastructure and associated problems. As a result the infrastructure deteriorated and stopped working. The responsibility of water services provision in these rural areas, in terms of the Section 84 (1) (b) of the Municipal Structures Act No. 117 of 1998 now resides with the District municipalities and by such right, the Water Services Authorities (WSA's) that have been legislated as WSA's (Republic of South Africa, 1998a, p.58).

Similarly in terms of the above section in the Municipal Structures Act, all urban and peri-urban development, water and sanitation provision is now the responsibility of the Water Services Authorities (WSA's) that are District Municipalities (Republic of South Africa, 1998a, p.58). All the infrastructure within the WSA's has or is in the process of being transferred to the WSA's, who will have to operate and maintain the infrastructure and ensure acceptable water and sanitation provision to all its beneficiaries.

All the Urban, Peri-urban and rural infrastructure falls within Local Municipalities, who are currently providing the water provision function to these areas within the uMDM.

In terms of Section 78 of the Systems Act No. 32 of 2000, an analysis of the District Municipality was performed by the Professional Consulting Engineers namely UWP Consulting Engineers in 2005, to determine the best mechanism in terms of organisational mechanisms that should be adopted for the provision of water services to the customers of the uMgungundlovu District Municipality (uMDM) (Republic of South Africa, 1998a, p.72). The analysis concluded by recommending the following:

” it may be concluded that the favoured institutional arrangement which would be able to address all of the identified issues should ideally involve a single regional (large) service provider, possessing an in-depth knowledge of the area of the operation of water services and with sufficient capacity in terms of human and material resources to meet the challenges of providing affordable, adequate and sustainable water services in the uMDM WSA.

On the basis of the assessment of the financial and in particular the fragmented institutional arrangements it is concluded that the internal mechanism is not in the interest of effective and sustainable service provision in the uMDM area of jurisdiction.

It is therefore concluded that the uMDM embark on a process of identifying this large regional service provider that will be able to cross-subsidise the cost of operational and maintenance costs in the uMDM area” (UWP Consulting Engineers, 2005, p33).

From the analysis at the time, the reason for not recommending that the uMDM adopt an internal service provision mechanism was because of the lack in human and material resources and an improper institutional arrangement. It was evident that the uMDM did not have the resources or the institutional arrangements to perform the water and sanitation operations and maintenance provision, however they were considered to be financially capable and since the completion of the assessment they have decided to establish the institutional arrangements and provide the human and material resources so as to adopt the internal mechanism contrary to the recommendations of the consultants of appointing a large regional service provider.

The uMDM Water Services Authority (WSA) is therefore currently in the process of an exercise of restructuring and taking over the water services provision from Local Municipalities who were or are currently performing this function on an interim basis.

There are a number of options available on how this function should be performed and what structure should be established to effect the service.

An investigation is necessary to assist the Water Services Authorities in transforming a multi faceted water and sanitation provision function into a combined and integrated internal provision structure that includes all development areas, to be managed by one statutory authority.

The proposed report will be a report on the practical application for the development of an internal water services provision structure for the uMDM, which can be used as a guide by other Water Services Authorities in the development of a similar structure for their Water Services Authority.

The reader will be referred to various readings, theoretical and contextual from which information has been sourced and as this is a new establishment where information is not available from within the context of the environment except for the section 78 assessment as previously referred to, much reference is given to the experiences of other similar Water Services Authorities, gleaning what has been successfully implemented and avoiding approaches that may be theoretically but not practically appropriate.

1.1 RESEARCH QUESTIONS / PURPOSE AND OBJECTIVE

The *research question* is “*What needs to be addressed in the reengineering of a fragmented institutional arrangement to produce an integrated and functional Water Operations and Maintenance Service Provision Business Unit?*”

The *purpose of the investigation* is to ultimately establish a Water Service Provision Unit that meets all the various requirements of service provision namely;

- a) Legislation and regulations,
- b) The required staffing and reporting structure, and
- c) The systems required to enable compliance with legislation and regulations.

The *objectives to be met in this dissertation* are to;

- a) Investigate the theoretical and contextual principles on which to develop a framework in terms of organisational structure and operational systems, on which to analyse existing organisational structures and systems for the reengineering thereof.

- b) Develop a model organisational structure and types of information and technical systems to be adopted for the Water Services Provision Unit.
- c) Ascertain that the model framework developed in b) above for the organisational structure is appropriate when tested against the opinions and current practices of the local municipalities from where these service provision practices will originate for the merging thereof into one unified operational unit.
- d) That the requirements of objective c) above also be ascertained for the information technology systems framework.
- e) That an estimate of the costs for the establishment of the proposed WSPU be produced, estimating the water tariffs that will be required to be charged to fund such an operation.
- f) To determine the critical factors to be taken into consideration when establishing similar water services provision units.

1.2 OVERVIEW OF WHAT IS TO COME

There are two approaches that can be taken for the establishment of the new WSPU. The first approach is continuous incremental improvement and secondly reengineering. The first option would entail the slight modification to the existing organisations systems, policies and organisational structure and what it is already doing. The reengineering option would involve a radical change of the organisational systems, policies and organisational structure and is usually achieved within one year.

It has been agreed with the current Water Services Providers that the uMDM will be taking over the function of Water services provision in July of 2006, which sets a goal in terms of the programme to be adopted. This deadline gives the team approximately 6 months in which to have a functioning Operational department. There is no other solution than to rapidly reengineer the operational departments, referred to as the Rapid Reengineering Process.

It has been observed that continuous incremental programmes often fail as the customers expect immediate breakthrough and not incremental change as was intended. For any significant change in operation it is necessary to change a number of elements and these changes often have to be made simultaneously, not allowing

incremental change in some goals and trade offs among them (Manganelli, R, p.19). The intention therefore is to perform a Business Process Re-engineering (BPR) exercise on the uMDM for the establishment of a new WSPU departmental structure.

In this investigation, clarity will be given on what needs to be incorporated into the WSPU in terms of systems, namely financial billing, asset management and supply chain management systems, information gathering systems, customer care and management reporting systems. Secondly clarity will be given on what the organisational structure in terms of staffing structure should comprise of, where the WSPU should be located within the organisation specific to an internal provision mechanism and what agreements will have to be put in place for the proper functioning thereof. It must be determined what services should be outsourced and which services must be performed by internal staff (Permanent employees or on contract) and how a Water Services authority would go about developing and establishing the systems and structures as mentioned above.

CHAPTER TWO

2 REVIEW OF THE THEORETICAL LITERATURE FOR THE REENGINEEING OF A CUSTOMER SERVICE ORGANISATION

As stated in the introduction to this dissertation, one of the objectives was to develop a model framework of an organizational structure that will be based on theoretical principles and on best practice. It was necessary that investigations be performed into the theory on which organizational structures and operational information technology systems are developed. As the process embarked on was a re-engineering process, the theory on reengineering principles was also interrogated so as to arrive at a comprehensive list of theoretical principles that could be applied in practice and guide the researcher in developing the most appropriate organizational structure and operational systems.

In this chapter an explanation is provided on the re-engineering process, and whom the reengineering team should comprise of, the literature to be taken into consideration in the design of organizational structures, information systems and finance systems. The chapter is concluded by providing the theoretical literature as a guide for the formulation of policy which is required as part of this reengineering process.

2.1 BUSINESS PROCESS RE-ENGINEERING

As the Business Process Re-engineering exercise has been adopted for the establishment of the uMDM WSPU it is necessary to give an explanation of the process to be embarked upon.

Business Process Re-engineering (BPR) makes changes in multifaceted goals, including, quality, cost, employee empowerment, greater availability of information, flattening of the organisational structure, flexibility, decentralisation or centralisation, more extensive use of technology, efficiency, and improved customer satisfaction and service, simultaneously (Manganelli, R, p.19, p.57).

It is not recommended that the WSPU be designed and developed in a vacuum or as a totally new initiative. This would depict the world of a single visionary but instead it should be a team activity with the team comprising members from all the organisations disciplines namely human resources, financial services, technical Services, corporate services, information technology, governance / policy development and trade unions (Manganelli, R, p.23). There must be fixed roles and responsibilities assigned to every team member including any suppliers, partners and consultants. It is important that the team be led by an executive business champion to ease organisational politics (Spur, k, et al., p.2).

A methodology will have to be developed and adopted by the team members as a road map that will guide the reengineering process to its finality and accomplishing its desired outcome. The methodology that must be developed must include amongst other aspects, the following:

1. A clear statement of corporate goals and strategies (Vision and Mission);
2. Customer satisfaction must be the aim of the strategies and goals;
3. Identify business processes and align them to corporate goals;
4. Identify value added processes;
5. Make use of proven and available management techniques and tools to ensure the quality of information used and BPR deliverables;
6. Analyse the current operations and identify processes that are not value-added;
7. Develop radical breakthrough visions and evaluate;
8. Consider solutions in which human resources empowerment and technology will effectively ensure the change;
9. Develop a complete business case to convince decision makers of the initiative, and
10. Develop an implementation plan identifying tasks, times and resources for the implementation of the business case (Manganelli, R, p.25).

Through the reengineering process we need to empower the employees, moving decision making, communication and control down to the level where the work is being done. We need to be able to improve significantly on the time taken in responding to the customer by implementing affordable measures within acceptable

reengineering costs and have mechanisms in place to evaluate the process and any alternative visions that may arise (Manganelli, R, p.25).

There are a number of stages that are addressed in the Business reengineering process namely;

1. The preparation investigates the business goals and objectives and defines limits to costs, risk and organisational change. In this stage the reengineering team is identified and a change management plan produced. It will be necessary to do a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis on the organisation/s that are involved in the reengineering process.
2. The identification of value added processes for the customer-oriented process model. These processes are the basis for customer's relationship with the organisation, and must meet their expectations. Looks at the organisations process maps, resource lists and recommends specific processes that are high on the agenda for reengineering. This may include the incorporation of suppliers and other business partners into the processes.
3. Looks for the breakthrough opportunities in the specific processes selected in 2 above that add value, and identifies them as visions for radical change. These breakthroughs can be in terms of change in work flow. It is advisable to benchmark ones organisation with another successful one and in the process arrive at innovative ideas to optimise processes.
4. Developing of technical designs and social designs required to implement the vision. The technical design involves the design of technology specifications, standards, procedures, systems and controls that are required for the interface between the social and the technical elements. The social design includes how we are going to achieve a number of key social issues namely; Employee Empowerment, skills mapping, building of process teams and self managed work teams, organisational restructuring and mapping, and employee rewards and incentives.
5. Implementing pilot and full production solutions for the new processes in the transformation process. This is performed in a preferred order where the process modelling is utilised in completing the design of the business system. This is followed by the implementation of the technical design and then the placement of staff into appropriate positions in the new organisational structure. Training will be

required for new staff which must be initiated. A process of continuous improvement is required to ensure incremental improvements from this point on (Manganelli, R, p.30-43).

2.2 DEVELOPMENT OF A FRAMEWORK FOR ANALYSIS.

As a new operational structure and systems are to be established, it means that there has to be a process of transformation referred to as re-engineering that will have to be performed, which will require an analysis of the current and proposed structure and systems (M Anstey, p.310). Before an analysis is performed in the research methodology on what needs to be transformed, a basic framework is required on which to base the analysis.

The basic framework should include the vision and strategic intent of the entity being transformed (M Anstey, p.306; Spur, K, et al., p vii, 50), which must be in synergy with the vision and mission of the organisation, and in this case the uMDM (Hunter, C, p.78). These corporate goals and strategies for the uMDM and the WSPU are as provided in the contextual literature review of this dissertation.

One way in which to begin to develop a framework would be to look at an established institution that have achieved a vision and mission that is similar to the one under consideration, and with which the organisation could benchmark itself against.

The classical approach to benchmarking is not recommended for this rapid transformation process as it will take too much time to perform. The classical approach includes for negotiating, arranging and conducting many site visits with various other organisations (Manganelli, R, p121). As there is no time to follow the classical approach a more rapid and modest approach should be adopted. The modest approach will rely on telephone calls as the primary source of information and business literature, information from major customers and suppliers as secondary and tertiary sources of information. Another secondary source of information would be an employee currently with the organisation who has direct experience with the organisations you are trying to benchmark (Manganelli, R, p122).

2.3 REENGINEERING TEAM COMPOSITION

It is necessary to establish a team that will run with the establishment of the WSPU for the uMDM from all the organisations disciplines namely Human Resources, Financial Services, Technical Services, Corporate Services, Information Technology, Governance / Policy development and Trade unions. There must be fixed roles and responsibilities assigned to every team member including any suppliers, partners and consultants that may be appointed so as to achieve a mix of skills and capabilities (Manganelli, R, p.23, p52). It is recommended that the team consists predominantly of existing employees who have a vested interest in the reengineering outcome. External members should be included where specific skills are required. It is further recommended that the team members jointly contribute half of their work time, on average to the reengineering process so that most of the team members stay involved in the process that they are reengineering. In the initial stages of the project the members should be almost fully committed, with only a few remaining fully committed and the rest contributing less than half of their work time as the programme continues (Manganelli, R, p62).

2.4 IDENTIFICATION OF PROCESSES

In the reengineering transformation process it is necessary to identify the processes that are currently performed in the organisation or the department that is undergoing a transformation. It is common to identify between 5 and 20 processes in the organisation (Manganelli, R, p77).

It is important to identify what the customer's wants and needs are and to consider whether the process identified for change will actually meet the customer's wants and needs. Should the customers needs and wants not be satisfied then the change in the process will most probably not meet any of the other objectives. In this case all changes made to processes must add value to the service delivery to the customers.

A manner in which to improve customer service is to integrate an organisation's processes with that of the customer. Let's make it easier for the customer to be able to align with the processes of the organisation. One example of this would be to locate payment offices in places that are more accessible to the customer, and one might get improved payment through an improved service to the customer.

The various processes need to be identified and the costs associated to each process determined. From this information one will be able to identify those processes that are costly and can prioritise those that with transformation will add value. The costs for these prioritised processes can be reduced to the most efficient threshold.

The expected time that it would take to transform the processes and the risk associated with the probability of success also needs to be taken into account.

From the processes identified and after analysis of the process in terms of the above criteria, the transformation process is started on those processes that have the highest priority. The benefits and opportunities of the proposed changes can now be determined and analysed in terms of the goals that have been set to be achieved.

It may be very clear to the team what the processes are that will have to be reengineered and therefore this simplifies the whole identification process.

The results of this identification and prioritisation process are then presented to the heads of the organisation for adoption. Once these recommendations are approved the team begins with the reengineering process (Manganelli, R, p.104).

In the case of the uMDM, there are some specific processes that are highlighted, which are the processes followed in the financial system and the more technical processes that are followed in the reporting and job allocation process.

There are sub processes within the above processes which will be discussed under each separate heading.

It is important that the processes are designed to ensure that the process vision is achieved, with the process vision being in line with the department vision (Manganelli, R, p132).

2.5 DESIGN OF THE ORGANISATIONAL / DEPARTMENTAL STRUCTURE

The definition of organisation is “a consciously coordinated social entity with a relatively identifiable boundary, that functions on a relatively continuous basis to achieve a common goal or set of goals” (Robins, p.6). The structure of an organisation refers to the general dimensions, characteristics and areas of responsibility (Robins, p.94). An organisational structure defines how tasks are to be allocated, the areas of responsibility and authority, who reports to whom, and the formal coordinating mechanisms and collaborative patterns that will be followed”, and lastly an organisational design is concerned with developing and changing and organisational structure to enable the organisation to achieve the organisational goals (Robins, p.7).

The three components utilised by Robins in describing organisational structure are complexity, formalisation and centralisation.

Complexity refers to the degree of horizontal, vertical and spatial differentiation in an organisation. The differentiation refers to the separation of units within an organisation. This occurs in organisations where there is largely specialisation of tasks and personal where different skills are required and where personnel speak a different professional vocabulary, and generally this results in these different specialisations being placed in different departments. The greater the number of specialised occupations with different knowledge and skills in an organisation, the greater the complexity will be (Robins, p.95).

The vertical differentiation refers to the depth of the organisational hierarchy or the number of levels (Robins, p.95). The span of control explains the horizontal structure or the number of subordinates working under a particular manager. The span must not be too wide or as a result the manager will be over worked and subordinates will not be correctly led and controlled. The span of control must neither be too narrow as this will slow down decision making, which is required to be quick in an unpredictable environment such as the operations function. Should the span of control be too narrow then there will also be inefficient underutilisation of managers (Smit & Cronje, p.231). The narrower the span of control, the higher the vertical differentiation and a tall organisational structure will result. The wider span creates a flatter organisation. The

greater the number of levels, the greater the potential for communication distortion and the more difficult it is for management to oversee the actions of operatives and ultimately the more complex the organisation is to manage (Robins, p.97).

The spatial differentiation refers to how the facilities and personnel are located geographically. The more dispersed the organisation is located geographically the more communication and coordination is required to be able to keep control of its activities and therefore the more complex the organisation becomes (Robins, p.99).

The second component identified for describing of organisational structure is formulisation, which is the degree to which jobs are standardised. Where there is high formulisation there are clear job descriptions, rules and clearly defined work procedures. The greater the formulisation, the less discretion is required from an employee and the lower the cost of employing such an employee. The less the formulisation, the more the discretion that must be exercised and the more you would have to pay for employing such an employee (Robins, p.102).

The third component used in describing organisational structure is centralisation or decentralisation. Centralisation is the degree to which decisions are made at a single point of the organisation and decentralisation is where the decision making is widely dispersed within the organisation. There is a limit to the amount of information that one person can process and at this maximum point it is necessary that someone else be assigned to make the additional decisions. This dispersion of decision making is called decentralisation. Another reason to decentralised decision making will be if an organisation needs to respond quickly to changing conditions or operational requirements. Decentralisation assists with quicker decision making as it avoids the need to process the information through vertical hierarchy (Robins, p.106). This explains why essential services and operational activities tend to be decentralised, as the employees need to be able to react quickly to the situations.

When looking at the ways in which an organisation can be structured one would consider the components of organisational structure as highlighted above and attempt to structure in the most effective way so as to achieve the goals of the organisation, but limiting the complexity to that which is manageable.

There are five distinct design configurations for organisational structure that are identified by Mintzberg (1975) and utilised by Robins and other authors namely the simple structure, the professional bureaucracy, divisional structure, machine bureaucracy and the adhocracy form.

There are several strengths and weaknesses of each configuration, with each configuration being best suited for different organisational contexts.

The different configurations can be summarised in terms of specialisation, formalisation, centralisation, environment and general structural classification as follows:

TABLE 1: SUMMARY OF FIVE CONFIGURATIONS (Source: Robbins, S, p.127)

Characteristic	Simple Structure	Machine Bureaucracy	Professional Bureaucracy	Divisional Structure	Adhocracy
Specialisation	Low	High functional	High social	High functional	High social
Formalisation	Low	High	Low	High within divisions	Low
Centralisation	High	High	Low	Limited decentralisation	Low
Environment	Simple and dynamic	Simple and stable	Complex and stable	Simple and stable	Complex and dynamic
General structural classification	Organic	Mechanistic	Mechanistic	Mechanistic	Organic

In addition to the summary of five configurations as shown above, another tool will be utilised as developed by Lawrence and Dyer (1983) which explains why these different configurations tend to dominate in specific organisations and environmental

circumstances. This tool is as shown in figure 1 below.

FIGURE 1: NEO-CONTINGENCY ANALYTICAL FRAMEWORK (Source: Pennings, J, p.380) - Revised to suit

Information domain Competitive variations Technical variations Customer variations Product variations Government regulation variations	High	Area 1 ADHOCRACY FORM	Area 2	Area 3 SIMPLE STRUCTURE
	Intermediate	Area 4	Area 5 DIVISIONAL STRUCTURE	Area 6
	Low	Area 7 PROFESSIONAL BUREAUCRACY	Area 8	Area 9 MACHINE BUREAUCRACY
		Low	Intermediate Resource Scarcity	High
Resource Domain		Availability of raw materials, human resources & capital Customer impact on resource availability Competitor impact on resource availability Government impact on resource availability Organised labour impact on resource availability		

As highlighted in table 1 and the figure 1 above, and considering the context of the operations and maintenance environment under question, only the machine bureaucracy and the divisional structure as highlighted will be further discussed.

Firstly the *machine bureaucracy* configuration depicts an organisation where reliance is made on standardised work processes for coordination and control. There are highly routine operating tasks, formalised rules and regulations with similar tasks grouped into functional departments. There is a centralised authority and decision making that follows the chain of command. In the operational context where there are similar and related occupational specialities, they are grouped together to form one department under one functional executive (Robins, p.115). In this configuration

organisations must find ways to survive with very few resources and a stable information domain. The organisations rely heavily on detailed behaviour programs and action generators (the means by which organisations coordinate activities, and control actions hierarchically e.g. job assignments or clocks) in order to minimise costs and hopefully cope with the scarcity of resources. There are scarce resources and the learning of the organisation is limited as a result (Pennings, p.381).

The strengths of the machine bureaucracy are:

- Ability to perform standardised activities in a highly efficient manner.
- A low cost for performance of routine tasks.
- The advantage of achieving economies of scale.

The disadvantages of the machine bureaucracy are:

- Scarcity of resources.
- They are generally poor at adapting to change.
- The subdivisions give rise to subunit conflicts.
- Employee alienation.
- There is a lack of initiative and unresponsiveness to change in their environment.
- There is generally an obsession concerning the following of rules.
- Organisational goal displacement by subunit or personal goals.
- The learning capacity is limited due to lack of resources.

(Robins, p.115, 311; Pennings, p.381)

The machine bureaucracy is most efficient in the case of large size organisations with stable environments and where a technology permits standardised, routine work.

Secondly the *divisional structure* is categorised as a set of autonomous self-contained units each typically configured as a machine bureaucracy with the divisional managers having a great deal of control over the autonomous division and reporting to a central head quarters (Robins, p.116).

With this configuration, the central headquarters provide support services to the divisions. These support services typically includes financial, legal and tax services. The headquarters act as overseers of the divisions, evaluating their performances and deciding where capital should be invested (Robins, p.117). There is high competition for resources and ideas but not overwhelming as in the case of the machine bureaucracy scenario. This organisation can combine the strengths of decentralised decision making, creating synergies across divisions by utilising some joint decision processes (Pennings, p.382)

The strengths of the divisional structure are as follows:

- It has the ability to perform standardised activities in a highly efficient manner;
- It provides clear accountability and responsibility of each division;
- It frees headquarters of the day to day operating details; and
- The divisional form is autonomous and the effective performance of one division has little effect on the other divisions.

The disadvantages of the divisional structure are:

- There is duplication of activities and resources, which raises costs and reduces efficiency;
- The tendency of the divisional form is to stimulate conflict and there is little incentive to encourage cooperation;
- The autonomy of divisions is exercised within constraints; and
- It creates coordination problems.

(Robins, p.118).

The divisional structure becomes more a necessity for an organisation that has a machine bureaucracy configuration but whose size is increasing and it is becoming more difficult to coordinate functional units and keep members focussed on organisational goals. With greater size, communication channels become strained and

ultimately greater complexity. Growth in size encourages a change to the divisional structure. It must be noted that in order to move to the divisional structure the organisational technical system must have the capability of being separated into segments, one for each division. The costs for such divisions are high and it is sometimes the obstacle that prohibits the change to a divisional organisational configuration (Robins, p.119).

The changes in the strategy of a business give rise to changes in its organisational structure and with the development of a new business entity restructuring is required. Strategy considers both the means of attaining the goal, and remains the fundamental influence on the way organisations are managed (Robins, p.142-p.143).

The restructuring of the current staff structures is to ***enable improved customer service***. It is recommended that the re-engineering shows a change from a functional departmental to a process team structure where there is a drive to educate employees, encouraging multi-skilling and working on a performance based reward system. Authority is required to be delegated to where the work is done. There should be a shift from the protection of functions to creativity and productivity and creation of more flexible supervision (coaching rather than controlling) on a flattened structure (M Anstey, p.318). With the flattening of the staff structure stature comes more from what you do than how many people you supervise (Manganelli, R, p60).

Improved customer service can be enhanced by utilising the logic of geographical decentralising of business units of the operations department. This structure reduces hierarchy and places control over organisations closer to where the customers are located, enhancing public service (Peters, B, p.36).

The hierarchical structure, which is more appropriate for the command and control management model is being seen as less effective for an organisational structure today as we are currently experiencing accelerated change. We require an organisational structure that is better suited to react to and deal with unpredictable events, especially in the operational environment (Manganelli, R, p.133). The most important aspect is that the structure must be optimal for achieving the objectives and should be functional to purpose (M Anstey, p.321).

Some ways of *improving the customer service* is to make some modifications to the traditional bureaucracy structure. There are some emerging trends in organisational design as highlighted by Robins are that help to revitalise old approaches. The relevant trends are as follows:

1. By focusing management effort on key responsibilities that require most of management efforts these areas become identified as specialised segments in the organisation. Where this organisation may have been more of a machine bureaucracy, by focusing of a segment of the organisation that requires more attention due to its importance *to the customer*, the organisation is moving more towards a divisional configuration form;
2. By decentralising of control where the ideas are generated at lower levels in the organisation for approval by more senior management with the responsibility of lower management to implement them. This allows for faster and more appropriate decision making;
3. By structuring management responsibility in such a way that their performance is assessed against customer criteria we will hopefully find that the nature of formulisation or adhering to rules changes in order to better serve the organisation's goals;
4. By improving communication without compromising the benefits that bureaucracy can provide. This may be achieved by investing in technology to information processing capability. One way of improving communication is to assign this job to a specific manager whose job it is to coordinate a task that crosses functional boundaries;
5. By improving the availability of information through the use of information technology, information can be more widely spread throughout the organisation. Not all information may be available but sufficient information should be available to counter power plays through hoarding information and to decrease management levels through reducing the need to gather and

disseminate information; and

6. By using the “working back” from the customer approach one can appropriately change the design focus of the organisation, by designing the organisation to respond *to the customers needs*.
(Robins, p.314 - p.318).

The proposed structure is required to be in terms of the above mentioned theory, showing a more flexible and flattened structure that is more inductive to productivity and improved service delivery. It is also important to develop competitiveness, which can be created through the utilisation of teamwork. The structure proposes to create teams namely the treatment works, reticulation and supply chain management teams for both urban / peri-urban and the rural context. All these teams will have to work together, combining skills and knowledge so as to achieve quality and productivity of service required. As a team they will exploit their strengths and conquer their weaknesses (Hunter, C, p.19). It was found that by forming teams that have more control over a specific task or process, there will be a considerable increase in productivity (Spur, k, et al., p.7).

The organisational structure has to be adapted to its environment. Smit & Cronje identify three environments within enterprises operate namely a stable environment, a turbulent and a technological environment. The environment that the operations function resembles is more turbulent of nature where more decisions have to be made by individual sections than by top management but there should be an attempt to create a structure that enables the environment to be as stable as possible by reducing the interface between departments (less coordination and cooperation between departments), as this interface slows down decision making (Smit & Cronje, p234).

2.5.1 The influence of technology

The use of technology can assist with the coordination between departments and making the organisation function more efficiently as a whole. Technology has an influence on the way and organisation is structured. It refers to the information, equipment, techniques and processes required to transform inputs into outputs.

When considering technology and complexity, evidence shows that routine technology is associated with low complexity where there is fewer numbers of occupational groups with less training possessed by professionals. This utilisation of routine technology refers to the structural activities in or near the operating core i.e. the maintenance employees and their first line supervisors. Non-routine technology is likely to be associated with high complexity where the span of control narrows and vertical differentiation increases. Teamwork and intensive coordination becomes common (Robbins, p.229).

When considering the relationship between technology and formalisation, studies showed that there is a positive relationship between the two. Where there are rules, manuals and the presence of specific job descriptions then routineness was evident. In the formalised jobs there is enough repetition to justify the cost of developing formalised systems. Contrary to this, more discretionary and flexible systems are required for non-routine jobs. This relationship applies more to small organisations and for activities that are at or near the operating core because the work is more predictable. In these environments high formalisation is an efficient coordinating device (Robbins, p.229).

The relationship of technology and centralisation generates inconsistent results and is moderated by the degree of formalisation. Routine technology should lead an organisation to centralisation but only where formalisation is low, and will apply to a decentralised environment where formalisation is high. Non-routine technology relies more heavily on the knowledge of the specialist and will be characterised by delegated decision authority.

Information technology is an enabling device that facilitates both centralisation and decentralisation. It can influence structure by reducing the vertical integration by the removal of middle management and is mostly used by those in routine data processing and design work (Robbins, p.230).

2.5.2 The influence of organisational culture

The organisational culture, being the beliefs and values shared by the employees of a company, contributes very importantly to organisational design. The organisational

culture also highlights the way things are done and raises a concern when a stable environment has to suddenly incorporate or merge with an environment that is more turbulent in nature. This highlights the requirement to reduce the interface or cooperation required from a more stable environment which may have a less productive culture, and requirement for quick decision making (Smit & Cronje, p.236).

The type of structure that will lead to the successful implementation of operational tasks will be influenced by the current culture of the organisation (Smit & Cronje, p236).

2.5.3 Influence of Social Design

In developing an organisational structure one will also look at the social design aspects of the organisation. As stated by Manganeli, there are many tasks associated with social design which affect the development of an organisational structure. Firstly there is a need to empower customer contact personnel. As the department under question has an operations function there is need for much customer interaction. It is evident that the majority of the staff that have direct contact with the customers are lower in rank and the least esteemed personnel. It is important to have clear communication with these employees and give them the resources necessary for them to do their work correctly, first time.

The organisation must cater for the internal customer as well. The contact personnel in the internal environment require assistance from other internal staff and the success of the contact personal depend on these other internal staff. This in effect means that all internal staff should view themselves as contact personal and should be able to deliver appropriately within the means provided for.

The process of characterising jobs is necessary as a stage in the social design. Here it is necessary to focus on the actual job that is to be performed and not the people that are to fill the posts. The posts required as determined previously are to be assessed in terms of their requirement in terms of Skill, knowledge and orientation. Skill would be defined in terms of the mastery of knowledge and the depth of attitude required. Orientation can be defined in terms of the requirements to manage, the activity to be

performed or if it is project orientated work, and whether the post required outdoors or indoors location.

As mentioned previously it is recommended that for the new reengineered organisational structure that multi skilling be adopted and that where possible some tasks be merged and whole job process from beginning to end be performed by one individual rather than many. This design will assist in producing more work, with a higher quality and one employee can be held responsible for the specific tasks.

Should the work to be effected be too much for one individual to perform then teams should be formed to perform the process with the team possessing all the skills, knowledge and requirements of orientation, and will be held jointly responsible for performance (Manganelli, R, p.164).

When defining the skills and staffing needs, one would look at the seniority level of each post. Those jobs that had been merged would have to be graded at the highest level of the number of jobs merged. It is necessary to analyse the control requirement for the job or how much responsibility is to be given to the post. Another factor to consider is the volume of work that each individual will have to process and a standard work volume decided on, which would be performed by each post. It is only after the reengineering process has been performed that one is able to assess the acceptability of the standard, which can be aligned more accurately if required. It may in some instances be necessary to make further changes to staffing arrangements. As it is difficult to determine the required staff complement at all times some techniques such as multiskilling, the allocation of overtime, employment of part time employees or outsourcing a process may be required (Manganelli, R, p.168).

It is better to underestimate the staffing complement than overestimate it and one can always utilise the above techniques if over utilisation of staff becomes evident. It is more difficult to resolve the underutilisation problem.

The management structure is to provide leadership, work management and personnel development. These functions are not always prevalent in one individual therefore in the reengineering process it is necessary that the three management roles are assigned

to people who have strengths in that management ability and perform them well. After the reengineering process the management functions should be assigned to those with the ability to perform them best and there should be no difference between the formal and informal organisational structure (Manganelli, R, p.171).

As noted previously from other texts there is a shift from a command and control management model to a more flexible, mentoring and coaching model which is better represented on a flatter organisational structure with fewer management levels. With multiskilling and employee empowerment there is more responsibility for workers or teams of workers to manage their own work which alleviates the management requirement by work management. More workers can therefore be supervised by fewer managers who will have a wider span of control that could range between 10 and 20 workers in the reengineered organisation.

In large organisations we typically have the senior managers who lead the organisation and first level management who manage people with middle management relaying information between the two management levels. It must be determined whether the middle management actually adds value or are their positions merely slowing down its response time and reducing flexibility. There is a tendency to remove the middle management positions from the organisational structure and create a more flattened structure. Technology, information and human potential (multiskilling) has enabled the flattening of the organisational structure creating a more responsive organisation (Manganelli, R, p.173).

In the reengineering process it is recommended that the number of departmental boundaries in an organisation be reduced to as little as possible. A reduction in boundaries that processes must cross, improves efficiency and the quality of the process because each boundary creates the need for additional effort, communication, coordination, additional chance for error, misunderstanding and disagreement etc. The fewer the boundaries the less the effort the more efficient the organisation is. It may be necessary therefore to create more autonomy and align the department in terms of function with all the relevant functions within the department.

It is necessary that an analysis is done of what requirements in terms of skill,

knowledge and orientation is required for any new posts that may be created, in comparison to the original post or another post that an employee will be transferred from. From this exercise it will be evident how much training will be required to transfer staff and arrangements can be made for staff to be sent on training courses.

Career paths need to be mapped for posts that are created so that there is scope for advancement of employees. In the reengineering processes, the compensation for a job that traditionally was based on position and reporting relationship now tends to be replaced by distinctions establish on knowledge and skill, which are difficult to compare with other similarly remunerated posts. As a result of this fresh approach to compensation based on posts that are made to be multidisciplinary, the salaries assigned to these posts can therefore be set at similar levels of salary to what seems to be a higher authority post without much dispute (Manganelli, R, p.181). An example of this is the creation of a post for a Millwright in the proposed organisational structure, whose duties cover both the Fitter's and the Electrician's function.

When re-engineering an organisation it takes time for the entire vision of the organisation to be put in place. It is therefore proposed that portions or sub-visions of the whole vision be established within a specific time period. This would show some advancement with the reengineering process. Here the social and technical designs will have to work congruently so as to achieve simultaneous establishment of the particular sub-vision.

The changes at this transitional point between the original situation and the final vision must include for job descriptions, management methods and organisational structure for which the changes are identified. Motivating the team to continue and fully complete the long term process is required when the whole process is divided into various stages of implementation (Manganelli, R, p.181).

A critical factor to take into consideration as mentioned above is to clearly define the job description stating the requirements of the job for a particular post which would assist in the employment of staff or the placement of transferred staff on abilities and not prejudice those who may be perceived, not to be able to perform the job due to arbitrary criteria such as gender, race or being handicap (M Anstey, p.318).

The most critical stage of the social design process is designing the change management programme (Spur, k, et al., p.1). It is necessary that during the preparation stage the reengineering team identify all the stakeholders that would be affected by the reengineering process and communicate with them on this process determining what the concerns are and how to deal with the concerns. All these issues raised in the preparation stage should be resolved at this point with the only issue to resolve now, being the matching of posts with incumbents. Continual communication on these issues is vital so as to keep the best employees informed and not to discourage them or they might find other employment. Within the communications plan there should be a program for education and training so as to encourage the acceptance of the change management programme (Manganelli, R, p.183; Spur, k, et al., p.2).

The social design of the reengineering process must include for incentives. The design of incentives are theoretically based on the work of two scholars namely Abraham Maslow and Frederick Herzberg who both had motivation principles that to some degree concurred with each other in terms of the content of the job. It is therefore necessary to design a job that is intrinsically satisfying and challenging, making employees more responsible for the results. By decentralising decision making and allowing employees to participate in these decisions is a motivating factor (Robbins, p.107). Career paths are to be planned so as to reward economically and non-economically with promotions made on potential and not performance. It is necessary to reward in monetary ways for performance (Manganelli, R, p.189; Smit and Cronjé, p.314).

Incentives need to be provided to encourage people to make the transition to, and optimise the reengineered process. People should also be encouraged to continually improve the reengineered process (Manganelli, R, p.189).

From all the previous steps preliminary plans for implementing the social aspects of the reengineering process including recruitment, education, training, reorganisation, and redeployment are developed. These plans must be aligned with the plans that have been developed for the technical aspects of the transformation.

2.5.4 The influence of networks

A discussion of networks is necessary so as to better clarify the positioning of an inter-organisational department or function as will be clarified further in this paper. It is important that in an environment where various institutions have interdependencies with each other, that continued interaction occur between them. A core task of managers is to create the linkages between the institutions and simultaneously manage the functions of one's own institution (Agranoff, R (1999), p.19).

In the emerging information or knowledge age networks have arisen, where people are linked across internal functions, organisational and geographical boundaries (Agranoff, (2001), p.22).

As highlighted it is noted that the establishment of networks is very much a social process and comprises of social structures that allow for the interaction between interdependent organisations or parts thereof for the exchange of information and for concerted actions and joint production (Agranoff, R (1999), p.20).

The network manager will have to select appropriate actors and resources to the network in dealing with the operational complexities. Very rarely is authority given to one manager to manage a network of institutions as a whole (Agranoff, R (1999), p.21; Agranoff, R (2001), p.12).

It is necessary for the manager to have a sense of all the potential collaborators for a network but the actual number engaged may be small. Managers need to have a sense of which partners are most compatible with the purpose of the network (Agranoff, (1999), p.24). All interests should be included in the network processes (Agranoff, R (2001), p.13).

Some emergence of networks is natural and others created merely by deciding to do so. It was found that depending on the type of policy instrument adopted, networks do produce results that would not have occurred from a single organisation (Agranoff, R (2001), p.23).

One of the problems incurred by networks is the pluralism problem which needs to be overcome to achieve effective collaboration (Bardach, p.13). The department head for the function under question must be skilled to be able to defuse the concerns of those participants of the network that may have this mindset.

The implementing network that will be formed in this context is a formal working group, the sort that has monthly meetings with a fair continuous membership of management (Bardach, p.26). There are various dimensions of network management which include technical, legal, political and cost dimensions. Dealing with the water treatment requirements for example becomes a technical basis of inter-organisational exchange (Agranoff, (1999), p.26). Regarding the legal dimension, the government legislations constrain actions of member units, through the distribution of funds and manpower, or through regulations that stipulate the power and responsibilities of certain actors, or specify what conditions potential actors must meet before they can actually qualify to be a network member. Key network actors are able to sustain their role in the governing process by having access to institutional resources, including political power. The cost dimension is related to the time required to pool resources and jointly develop strategy and operate in the network (Agranoff, (1999), p.27).

As stated by Bardach (1998), the test of purposeful interaction should be that the effort of the network adds public value to the organisation that would otherwise work independently. It has become evident that value is added when managers demonstrate skill at jointly solving problems (Agranoff, (1999), p.33).

Leadership is required to encourage the required nature of pragmatism and to create a secure environment for participants to work collaboratively with one another (Bardach, p.268).

As highlighted from the text above it is better to function in a network as apposed to independently. As the provision of water and sanitation services is a cross boundary and cross functional activity it is necessary that additional stakeholders be engaged by the uMDM as the WSA to participate in the decision making process. The use of networks is necessary in this context. It must further be noted that to be able to facilitate a network the responsible person representing the uMDM / WSA will have to

be in a senior position, which encourages the establishment of a specific department with a departmental head to perform this function.

2.5.5 Lines of communication and reporting procedures.

In a structure that implies a more hierarchical structure the structure lends itself to a more command and control type of organisation. This structure is good for enforcing a high level of conformance but not very good at achieving high levels of commitment from its employees. The greatest weakness in this structure is that it is inflexible and slow moving not enabling quick responses to changes that may be encountered and is considered as a severe impediment to effective management and governance. The command and control model is being seen more and more ineffective in the organisation today (Manganelli, R, p.134; Peters, B, p.51).

To be able to rectify the problem with the command and control model it is necessary to adapt to a more flexible model characterised by relatively short lines of communication between the workers and senior management. More responsibility needs to be given to lower levels and authority delegated to lower management levels (Manganelli, R, p.135). The organisation should therefore create mechanisms through which participation and communication will not only be downward but in all directions. If lower management and including workers are more involved in the organisation and empowered to make their own decisions then they will be more productive (Peters, B, p.54).

2.5.6 Other issues

When evaluating the existing employment in the affected municipalities one must not only look at the shape of the organisation structure or in this case the functional department but must also assess the indicators such as the strength and weaknesses of individual employees that will be transferred to proposed posts in the new staff structure, especially managers. Other indicators to be assessed are namely, the performance levels of employees, the labour turnover, absenteeism, occurrence of strikes, disputes and grievances, competencies, productivity levels, worker morale and attitudes, employment costs, the number of vacancies and trade union demands. These factors must be utilised in realigning the organisational / department structure and reporting relationships (Hunter, C, p.80).

The finalisation of the organisational / departmental structure can be completed after the SWOT analysis has been performed. This structure must be developed in line with what the appropriate size and nature of the department will be in the future (next five years) and it must be decided which posts require to be filled immediately and which can be filled at a later stage. A reflection on the old organisational structure and the new structure is required at this time as to reflect on where we are currently and where we want to be (Hunter, C, p.80).

The social design must be performed simultaneously with the technical design as the component of processes must be congruent with the organisational structure if the restructuring is to be successful. The social design must produce plans for recruitment, education, training, career paths, reorganisation and redeployment of staff (Manganelli, R, p.157).

2.6 TECHNICAL OPERATIONAL SYSTEMS DESIGN

There are two ways in which organisations can be improved namely by utilising simplification solutions, which are derived from what is called quality school of process engineering and the other being information of process engineering. The latter tends to focus on information flows, data, systems and technology. The best re-engineering contains elements of both (Spur, k, et al., p.8). The key to competing in today's environment are quality speed and flexibility and this can be achieved through the redesign of business processes (Spur, k, et al., p.157).

As also mentioned elsewhere, it would be good to have a systems engineer as part of the multidisciplinary task team for the re-engineering of the information processes and should possess a number of technical and professional skills in the following disciplines namely systems analysis; system dynamics; quality management; organisation and methods; work design; costing; project management; data management and be a fluent personal computer user, to handle analysis and presentation work (Spur, k, et al., p.11).

The whole Business Process Redesign (BPR) must focus on the customer and look at how the organisation works to meet the needs of the customers and to increase the

value provided to the customer. It is important to focus on the value and not the cost, which will make the BPR relevant to the customer and not to the organisation itself. As a consequence of this focus one should identify inconsistencies and cross-functional coordination issues that must be born in mind for reengineering. If this is not done then there is a tendency for projects involving IT to lose their focus and turn into merely a “technology project”.

Information technology plays three major roles in innovation. They are that it opens up new business opportunities, it provides a platform of systems and capabilities that new working practices can be based on and it allows new systems to be put in place (Spur, k, et al., p.24). Although work can be done much more effectively by automating it, one should stop simply automating old ways of working; there must be a fundamentally better way of defining, organising and running a business.

There are three drivers behind the ineffective use of IT that need to be overcome i.e. (a) the potential of IT, the organisational structure and the position of the IT department, (b) the people, skills and procedures that are in place to deliver IT, and (c) the corporate investment in applications and computer systems.

It is important not to be seduced by the potential of technology. Some managers think that technology can solve all their problems and feel more comfortable with machines than with human beings as they humans fail to behave like they should. It is important to focus on the human aspect as it is the people at the end of the day that deliver the business benefit (Spur, k, et al., p.26).

It is important to note that most organisations are over-centralising the IT divisions and the IT divisions often behave as a monopoly supplier and are seen to be the means to the end. By fitting the IT division into the prevailing business culture to which it adapts instead of acting in more of an unwieldy way. The IT can deaden innovation by forcing it to fit into a central plan. If one focuses too much on the technical performance of the IT division one could undermine and divert innovation due to lack of business awareness. By prohibiting resources from working on unimportant IT activities one is limiting the opportunity of innovation.

One of the problems that could arise with the people skills and procedures is that some methods have proven to be successful in the past and it is often assumed that this is the way and set as a standard, which requires that the future must continue to fit this model. Good information engineering skills are required in designing information infrastructure but often too much emphasis goes into how the process will work rather than what the new process should be. The process can be hijacked early on and turned into an information engineering exercise (Spur, k, et al., p.29).

The magnitude of the corporate investment in the system will decide how capable the organisation is at exploiting IT for business advantage. If IT has been a normal part of business then the possibilities that the corporate investment is good and there should be sufficiently skilled personal to exploit the potential of process based computerisation. The converse is also true (Spur, k, et al., p.29).

There are six specific recommendations made by Dr Lockett's study into 30 projects that are required in achieving business success with IT projects namely that there must be a business champion for the project, cross functional teams must be established, one needs to limit technology risk by using proven IT, use of prototyping and experimenting with a solution before adopting it unanimously, move from loose to tight management and know when to conclude the innovation and produce a result, market the new way of working like a new product so as to convince the users that changing the status quo is worthwhile (Spur, k, et al., p.31, p.57 & p.139).

As already stated under the subsection "identification of processes" there are two technical services systems that will be established for the new WSPU, one being an information reporting system and secondly an operations reporting system.

The term information is often neglected and assumed to form part of technology but it must be assessed separately as an enabler in its own right. A solution that provides better information is all that is required (Manganelli, R, p132).

The technical design attempts to utilise technology and information jointly to improve the performance of how processes are performed. It is noted in (Spur, k, et al., p.2) that the technical design requires inputs from four sources, graduates from business

school, analysts and designers from the information systems department, technocrats that know the state of the art of information technology and the companies line management.

Information technology can ensure the instant availability of correct and up to date information to every part of the organisation simultaneously. It can completely replace some tasks and improve the efficiency of others. It eliminates the need for the physical flow of information, reduces dissemination time, reduces transcription errors, controls data redundancy, and improves both consistency and currency.

There is a growing realisation that the flow of information within and between traditional structures no longer works well. There is a need, as one executive of General Electric called a “boundaryless” company, which does not have barriers between traditional functions. The use of technology is assisting the move towards such an idea but it has not yet been extended to its fullest capability (Spur, k, et al., p.179).

The question is how does one identify opportunities for applying information technology? It requires observing the organisation in a holistic and dynamic manner. Porters value-chain analysis is one useful tool to help view processes within organisations and across a sector. A value chain are those activities i.e. products or services, which add value, for which customers are willing to pay for.

It is those activities that do not add value that have to be changed or omitted. The following activities in the business process are where changes or improvements can be made:

- (1) unnecessary process steps (non-value added);
- (2) duplicated tasks and data;
- (3) conflicting or contradictory steps with the process;
- (4) blockages and time lags at linkage points;
- (5) time-consuming, error-prone manual procedures;
- (6) below-average benchmarks for time and cost of steps; and
- (7) other factors limiting efficiency or quality in the process.

(Spur, k, et al., p.188).

The technical design stage should produce descriptions of the technology, standards, procedures, systems and controls employed in the reengineering process and how the social and technical elements are to interact. The design will finally produce preliminary plans for systems and procedures development, procurement of hardware, software, and services; facilities enhancement; test, conversion, and deployment. (Manganelli, R, p136)

In terms of the technical information system aspects to be provided and as already mentioned, it is required that information be obtained on a regular basis from the entire water infrastructure that the WSPU is responsible for. This can be achieved by installing a telemetry system. Another information technology system that is required is a system which will assist in the communication of information between the customer, WSPU and its employees, departments within the organisation, senior Management and external service providers. This system is basically referred to as an operations reporting system. This Operating system will be a software package that will also coordinate the actual operational work that is done by the employed officials out in the field.

There are some questions that need to be answered in terms of the information required so as to design and procure a system that will be best suited to the requirements. The questions are as follows and will be answered separately for each of the two systems already mentioned:

1. What technical resources and technologies will we need in the reengineered process?
2. How can these resources and technologies best be acquired?
3. What information will the reengineered process use?
4. How will the technical and social elements interact? (e.g., the human interface of the system) (Manganelli, R, p136).

The redesign process can be feasible through the use of a creative application of information technology and a good understanding of the requirements of the business.

2.6.1 The Telemetry system

More information on the telemetry system has been provided in chapter three of this document; however it is important to note that the telemetry system combines both technology and information, with the word used to describe this type of application being “informaté” which combines both technology and information in improving technical design (Manganelli, R, p.133).

The various applications for which information is required to be received by way of a telemetry system needs to be determined. Determining these items, referred to as entities and the relationships between the technical and the social elements forms the basis of the information model for the process to be adopted (Manganelli, R, p.138).

2.6.2 Operations Reporting System

It is important that a thorough assessment is made of the present and the future information requirements. A proper understanding is required as to how the system will interface with other council information systems. The system should be able to support the addition of tools such as risk management, predictive modelling, optimised decision making, financial modelling and works management (INGENIUM, p.4.2).

It is important to have good communication with those who are actually performing the work on the ground and to encourage quality of work, it has been found that feedback to the workforce on the processes performed is critical. A mechanism that enables feedback has to be included in the design of the operations reporting system (Manganelli, R, p.132).

One of the critical aspects is to ensure that the operational reporting system matches the organisational structure and operation. The operational structure must be able to utilise the reporting system to improve and not restrict its performance (Manganelli, R, p.135). There must be a good interface, creating good interaction between the customer, reporting station, workforce and business partners.

There are a number of other requirements of the reporting system namely;

- the system must cater for future increased size and complexity of infrastructural networks and operational procedures;
 - the system must be able to collect data for reporting and financial planning so as to optimise and provide justification for the renewal of infrastructure and capital investment programmes;
 - the system must be able to operate over a range of hardware platforms and over a range of industry standard databases;
 - the system must be able to interface with other corporate systems; and
 - the system must be enabled for flexible report writing.
- (INGENIUM, p.4.2)

An opportunity to reduce process fragmentation by consolidating interfaces and information can be done using technology. Centralised information stores comprising of data, text, imaging systems, voice storage systems for all types of information can be accessed by a number of people from different locations and this will ensure that everyone will be utilising the same information facilitating common understanding in decision making (Manganelli, R, p.146).

The centralising of information control centres and stores will add value by reducing time in communication and by reducing staff complement required for capturing and managing information (Manganelli, R, p.147).

The requirements in terms of budgets to establish the system will have to be known so as to budget for such an initiative. It is also required that there is availability of systems specialists and a support structure that will be able to support the organisation with trouble shooting and further development of the system (INGENIUM, p.4.2).

It will have to be decided whether to procure a system off the shelf, by integrating off-the-shelf components or to develop a custom solution to suit the environment. These three solutions affect time, cost and risk and generally the development of a customised solution is only adopted for large, specialised and most performance critical processes. For procuring off the shelf solutions one will have to investigate as to what is commercially available, talk to vendors and receive demonstrations, but

only after the initial investigation of other organisations that one would benchmark oneself against, so as to make an informed analysis of all the available products. It is unlikely that one would find an off the shelf solution that meets all your requirements and therefore will need some customisation. (Manganelli, R, p.155; Spur, k, et al., p.142).

As provided by Davis, W (1994) and Whitten J, (1994) there is a need to do a feasibility study on any new software systems that are to be introduced into an organisation. It is further recommended that a feasibility analysis be performed on the system in terms of the “TELOS” procedure so as to determine whether the proposed software system will be applicable within the existing organisational environment.

1. The “T” in “TELOS” refers to technical feasibility. It is based on the availability of existing technology and the acquisition of additional technology that will support the proposed system. It indicates whether the organisation has the necessary expertise and infrastructure available to develop, implemented and operate the proposed system. It further asks whether the proposed system will be able to meet the initial performance expectations and accommodate any expected new use and functionality over the medium term.
2. The “E” in “TELOS” refers to Economical feasibility. It is based on whether the organisation has the funds to commit to purchasing, developing and implementing the proposed system. It is a measure of the cost effectiveness of a project or solution. It is utilised to select between alternative project alternatives, on an economic basis. The question whether and how the project will benefit the organisation and what the return on investment will be, must be answered.
3. The “L” in “TELOS” refers to the legal feasibility, whether the proposed system complies with the law and whether there are any conflicts between the system under consideration and the organisations ability to discharge its legal obligations.
4. The “O” in “TELOS” refers to operational feasibility. Here the question is asked whether the organisation has the personnel skill to be able to operate the proposed system or would procedures and skills have to be acquired. The question as to

whether the system will really meet the needs and expectations of the organisation and solve the business problems will need to be answered. Cognizance must be taken of the corporate culture, management support and the nature and level of user involvement, in the development and implementation of the system. It is a measure of how people feel about the system.

5. The “S” in “TELOS” refers to Schedule feasibility. This refers to how long it will take until the system is up and running. The system must be operational within an acceptable timeframe so as to realise its benefits and meet constraints (Davis, (1994); Whitten, (1994), p.815).

2.7 FINANCIAL SYSTEMS

There are two types of financial systems that will be analysed namely the Supply Chain system (Centralised and decentralised), the billing system and the debtors control system.

2.7.1 Supply Chain system

The operations system operates a transformation process that ultimately changes inputs into outputs with the inputs being materials, expertise and services obtained from outside organisations and the outputs being useful products. The supply chain finally delivers those products to customers through distribution centers (Raturi, p.196). In terms of the supply chain system it is often better to obtain supplies from outside organisations rather than generating all the inputs internally. This is due to a number of reasons such as lower cost, better flexibility, newer technology, wider perspectives and to encourage the success of minority-owned or potentially emerging businesses etc. (Melnyk, p.603).

It is necessary that suppliers understand the needs of the customers, including the exact nature of the problems that its personnel encounter. The operations manager must also understand the capabilities and limitations of the supplier (Melnyk, p.606).

As part of the procurement process the operations managers must work with suppliers through intermediaries in the purchasing function. The purchasing staff usually manage all relationships with suppliers and arrange the issue of orders. The

buyers make the final decisions about what the firm buys, from whom it buys, and the terms and conditions of payment. The operations managers, suppliers' representatives, and purchasing agents all work together, to ensure productive interactions between the firm and its suppliers (Melnyk, p.607).

Organisational purchasers have the advantages of possessing purchasing power and can often negotiate for large price discounts. Besides lower prices, long term relationships develop, which is in the best interest of the supplier to maintain and therefore this encourages prompt delivery and good service reducing the risk for the purchasing organisation (Melnyk, p.609; Meredith, p.266).

It is necessary that corporate purchases evaluate on more than just price. The operations manager is more interested in supplies being reliable. The purchases also assess suppliers on criteria other than price including product quality and procedures for assuring continued good quality, past performance, location, warranty, service, desire for business, labor/management relations, management structure, manufacturing processes, housekeeping procedures, and general conditions in plants and facilities etc. Prices are often only compared after the non-price criteria have been assessed. Price usually governs organisational purchases only for standard, commodity-type products (Melnyk, p.609).

There are some major responsibilities of purchasing. Their responsibility covers a wide range of topics that require specialised skills and knowledge namely the setting of terms and conditions of purchases, supplier selection, supplier scheduling and the education of new suppliers on purchasing policies and procedures. Purchases are further responsible for supplier evaluation and feedback on how they can improve to increase buyer satisfaction and to discuss and resolve supplier and buyer concerns and expectations, and measure the performance of both parties (Melnyk, p.611; Raturi, p.197).

Different suppliers interact with an OM system in different ways. There are those on the one hand that represent traditional relationships where there is distrust between the supplier and the purchaser, those relationships that are characterised by close working relations and there are those relationships that are in-between. The former represents a

confrontation type of relationship and the later a more partnership relationship (Melnyk, p.616).

In the confrontational relationship as mentioned above the buyer designs everything in-house and does not take any or little advice from the expertise that the supplier may offer. The price of the good or service outweighs other considerations such as quality, reduced lead time and improved flexibility. Because of this there is generally a multitude of suppliers, a lower quality of goods and less predictable lead times. The purchaser may need to hold large quantities of inventory and inspect incoming products for quality, which will increase overhead costs for the storage of the inventory and the salaries of inspectors. Due to low cost being the variable for decision making the relationships between the supplier and purchaser are short lived and end as soon as a supplier offering a lower price is found.

The advantage of the confrontation relationship is that it encourages the price of products to be pushed as low as possible and encouraged suppliers to look for opportunities to do this (Melnyk, p.619).

The partnership relationship on the other hand encourages mutual survival through unification and the coordination of the activities, as allies seeking a common interest and goal. The use of partnerships further takes broad steps to maximise value for the buying organisation and its customers, reducing risk, total cost, and improving the overall competitive position of the buying firm.

As contrary to the confrontational relationship, the partnership invites suppliers to participate in design efforts and sharing of skills and expertise. The number of suppliers is limited to a few selected competent, qualified and cooperative suppliers who are financially stable, have the technical capabilities, an appropriate management structure and management personnel, and an effective planning and control system (Melnyk, p.623; Meredith, p.265).

This may seem risky but by selecting a good supplier one should be able to significantly improve ones' quality, lead time, cost, and flexibility by concentrating ones' orders with the best suppliers. This also reduces its administrative costs for

managing suppliers. Routine interaction between the suppliers and the buying organisation is beneficial for both, creating better solutions than what they could if working independently. The partnership should be a long term relationship, which enable the organisations to build that sprit of cooperation. As this is a partnership it is important to note that no one gives orders, but rather listens to others and contributes to common decisions that guide the OM system activities in both firms. An open and trusting negotiation process is required in the partnership transformation process between the supplier and the buyer organisations (Melnyk, p.623).

The advances in technology have facilitated information sharing and easier communication between buyers and suppliers. An example of technology where partnerships are encouraged is the EDI system where information is exchanged continuously between the parties on inventory scheduling, monitoring, and payment systems. This real-time facilitation removes the boundaries and increases efficiency in supply from the supplier (Melnyk, p.625).

It is important for the organisation to manage its inventory. This is a focus on managing the physical stock to ensure that materials are available for work-in-progress as well as for external customers. The organisation needs to constantly monitor all aspects of the ordering process so as to reconcile material, information and fund flows with suppliers. The supply chain management should be seen as a system that encompasses the entire value chain from suppliers to customers (Raturi, p.197).

There are four basic functions in managing a supply chain, which provide and excellent framework for understanding the complexity in a supply chain and can be used to improve ones performance. This framework is referred to as the supply chain operations reference (SCOR) model and includes for planning, sourcing, making and delivery. An organisation needs to plan a strategy to balance aggregate supply and demand, source goods and services to meet the planned demand, make the demanded goods and services and deliver the goods and services by managing their orders, transportation, and the distribution thereof (Raturi, p.198).

Sourcing of goods and services involves developing and managing a set of suppliers that can provide the appropriate inputs to the organisation at the right time, quality and

cost. Many organisations are now focusing more on their core competency and therefore more functions are being outsourced therefore emphasising the importance of contracting the best supplier (Raturi, p.198; Meredith, p.263).

One of the most important functions of the supply chain management system is inventory management. Raturi defines inventory as an asset held for future use (Raturi, p.202). In terms of an operations department there are some primary reasons why organisations carry inventory. The first is for economies of scale, where the more items one purchases, the greater the discount could be and the lower the total cost is per unit purchased. The second reason is as a protection against supply disruptions and demand surges where supply disruptions would result in process starvation and down time and where demand surges would result in delayed deliveries and customer dissatisfaction. The third reason is to profit from price changes where an organisation may purchase more at a time when the prices are low or reduced or before the prices are expected to rise substantially (Raturi, p.202).

Inventory takes on many forms which include lot-size, work-in-progress, finished goods, fluctuating of safety stock and anticipation inventories, each with a different meaning and can be described as follows. Lot-size inventory is purchase raw materials and components; Work-in-progress inventory is a buffer to protect against supply disruptions and demand surges; finished goods inventory minimises the effect of demand and provides better customer service; fluctuating or safety stock inventory is required to cater for seasonal demands as well as anticipation inventory that is built up during the off-season to meet future increased demands (Raturi, p.202)

It is important to balance cost of administrative work and information processing, the quantity that should be ordered and when orders should be placed. By achieving the best balance one will be able to reduce ones costs and also achieve a minimum cost inventory policy. The more the control placed on monitoring inventory levels the higher the administrative cost but the fewer the stock-outs and better the customer service. The larger the order, the less frequent they are made, the lower the ordering costs but the higher the holding costs and visa versa (Raturi, p.202). In the operational environment it is necessary to constantly replenish inventories.

The measuring of inventory management performance can be classified into five categories, the first being the amount required to sustain normal operation, the second being the inventory that is in excess of that required for normal operation and third being the amount beyond this. Obsolete inventory is that inventory of a product that has been discontinued and new product inventory is that product that is in the early stage of its life cycle.

The cost of maintaining inventory is the principle reason for determining inventory policy, how much inventory to carry and the frequency of ordering. These costs can be categorised as the cost of the items, the order preparation costs, the inventory holding costs and the shortage cost or the cost of buying a substitute at a higher cost resulting in lost profit opportunities (Raturi, p.205). Other appropriate ways of measuring the performance of the supply chain system is whether the following has been achieved namely perfect order fulfillment, customer satisfaction, order fulfillment lead time, total supply chain costs and the inventory turnover ratio (Raturi, p.206).

The reduction in the lead-time for the delivery in the supply chain significantly reduces inventory levels and the total supply chain costs. It is purported that there is a $(x + \sqrt{x})$ percent reduction in the inventory level for every x % reduction in lead time (Raturi, p.207).

When designing a supply chain system in the context under question it is important to ask how the organisation should choose suppliers, what the best distribution network is to support the delivery of goods to where they are needed, the amount of centralisation or decentralisation in the location of facilities and the type of planning systems that should be utilised (Raturi, p.208).

The location of facilities has a marked influence on the cost and service characteristics. It is favourable to have decentralised facilities for improved customer service. By adopting a centralised system the inventories are pooled thereby reducing the overall inventory levels, however the response time with regard to customer service is increased. The traditional supply chain model attempts to balance the facility cost, transportation cost, and other costs to determine the location that will

minimise a firm's total cost, ensuring that the aspect of service delivery is sufficiently provided for (Raturi, p.210).

The planning system can be described by either a pull or a push distribution system. The pull distribution system is where the upstream entity responds to the demand signals from downstream entities. The push distribution system relates to a system of pushing products downstream based on a forecast. Information technology can be used effectively in blurring the division of the pull and push system achieving a better result being a combination of both systems (Raturi, p.211).

In the WSPU context it will be necessary to utilise a more centralised distribution system with decentralised facilities to which inventory will be sent utilising the pull distribution system, which is more appropriate as one is never sure what products will be required or what will be utilised. There are some inventory requirements that could be forecast and a base stock for an expected demand provided for. An information technology system would assist in performing such a combination of systems (Raturi, p.211).

Due to uncontrollable fluctuations in the demand of some products it is sometimes difficult to balance supply and demand. This phenomenon known as the bullwhip effect can be minimised by utilising a number of tools namely demand forecasting utilising historical demand trends, which in the operational environment could also be linked to the change in seasons, and ordering larger quantities for an extended period at a time and when prices are low (Raturi, p.216). Other ways to reduce the bullwhip effect is to reduce lead times through just-in-time programmes, which allow for immediate deliveries, reducing inventory sizes and having more frequent deliveries, and sharing information of inventory levels with suppliers (Meredith, p.268).

For the effective management of the supply chain system for the WSPU it is necessary that a variety of tasks be managed namely the procurement and supplier relationships, the warehouse and inventory, the transportation and distribution, and the information management (Raturi, p.217).

The procurement function includes receiving, reviewing and evaluating purchase requisitions, selecting qualified suppliers and seeking for new suppliers, placing and following up on orders, authorising payments and maintaining records. It is important to establish good customer / supplier relationships where co-dependents is encouraged. There partnerships can reduce the number of suppliers and reduce the competition between suppliers for the same product. With these types of relationships the suppliers can have more long term contracts, benefit from economies of scale, reduce the costs for the customer and are more willing to make investments in improving the product. It is further beneficial for companies to require suppliers to meet quality control requirements in the production processes and meet specific tests. This ensures that the quality of the product is very likely to be good and reduces the need to thoroughly inspect the product on delivery (Raturi, p.219; Meredith, p.266).

The correct decisions on the transportation of materials and goods within the supply chain are required. The factors to be taken into consideration regarding transportation are speed, accessibility, cost and capability (Raturi, p.220).

Information technology is vital for the performance of the supply chain. The system should obtain information about all elements. The systems are utilised to analyse historical data and forecast what the business patterns are going to be. The use of the internet is beneficial, drastically reducing costs, speed of approvals and gives buyers more autonomy over the process (Raturi, p.221; Meredith, p.276).

Utilisation of the “just-in-time” purchasing procedure increases the importance of purchasing and procuring goods as delays in the receipt of the correct materials will stop the just-in time program (Meredith, p.263).

There is sometimes an opportunity to assign responsibility to suppliers for some aspects of the business (outsourced vendors), one example being Just-in-time inventory control, data processing and the operation of communications networks. The question to be answered here is whether by out sourcing one is adding value or not (Manganelli, R, p.140).

There are some measures in which one will be able to determine the effectiveness and efficiency of the supply Chain Management division;

2. Measure the time taken for the division to process a quotation or Tender document from its date of submission to the date of issue of order or the award of a tender.
3. Solicit comments from officials in the various municipalities of their opinion of the effectiveness and efficiency of the division within the municipality.
4. Identify the staff complement available in the municipalities to perform the task required.
5. Identify the skills of the staff appointed to perform the function.

2.7.2 Information technology appropriate for the financial environment

The use of computer information systems has revolutionised many spheres of life including the efficiency at which accounting and business processes are performed. There are two broad categories of software programs namely system programs and application programs that are utilised. The interest of the uMDM is in the application programs that facilitate accounting applications namely ACCPAC, SAP, Oracle, etc. These financial accounting modules provide for: general ledgers, inventory, payroll, sales billing, accounts receivable and receipting, purchases and payments, creditors and master files and transaction files etc. (Puttick, p.251).

As stated in the South African Auditing Standards (SAAS) on the 'Risk assessments and internal control - CIS characteristics and considerations', the benefits of the IT system are consistency of performance, programmed control procedures and systems generated transactions (SAAS 4011, paragraph .04). There are however risks that one will have to be aware of and for which control measures will have to be put in place.

All data must be well organised into different data files in the computer software for ease of reference and proper structuring of information. There should be various IT environments with each environment having different data processing methods, risk profiles, internal controls implications and audit implications.

The first environment is the stand alone personal computer. These computers are used for the processing of accounting transactions and producing reports that are essential to the preparation of the financial statements. Simply “off the shelf” type software packages are normally utilised. To provide against risk it is essential for backups and storage of the backups to be made in destinations other than where the stand alone computer is stationed. There are other necessary controls which include for ensuring that licensed software is utilised and that there is protection against viruses etc. (Puttick, p.254).

The second environment is the database system, which is the collection of data that is shared by many different users for different purposes. There are primarily two aspects of the database system namely the database and the database management system. The database needs to be set up in such a way that allows multiple users access through different application programs. There is a need for the ownership of the data ensuring its integrity and for the proper utilisation of the data. Resources must be allocated for performing these two functions (Puttick, p.255). In a database system, general controls have a far greater importance than application controls. Detailed guidance on these aspects are provided for in the South African Auditing Practice Statements (SAAPS) as passed by the South African Institute of Chartered Accountants (SAAPS 1003, paragraph .22 to .27).

The third environment is the on-line computer systems. This environment allows users to directly initiate various functions, e.g. entering transactions; making inquiries; requesting reports; updating master files; and electronic commerce activities. Online systems use many different types of terminal devices e.g. general purpose terminals and special purpose terminals. The special purpose terminals have more reference to the requirements under question and include point of sale devices, automated teller machines, and hand held wireless devices for entering data from remote locations. Terminal devices may be found either locally or at remote sites and are linked and share information through local area networks (LANs) or wide area networks (WANs). Authorised employees, business partners, customers and other third parties may gain access through the electronic data interchange (EDI) or other electronic applications (Puttick, p.259).

The fourth environment is where the transactions are processed by external service organisations. As stated elsewhere in this document there is a tendency for organisations to outsource their non-core business of which information technology is one of them. When this system is utilised a risk assessment must be performed and necessary controls and procedures set in place to prevent fraud, error or misstatement (Puttick, p.260).

The fifth environment is electronic commerce or e-business, which is when computers are connected over a shared public network such as the internet. This environment introduces new elements of risk to the audit of financial statements. Examples of e-commerce include, amongst many others: banking, advertising, news media and education etc. This environment presents a different risk, which needs to be assessed and controls and procedures set in place (Puttick, p.266).

The last environment to be considered is data warehousing. The data warehouse is a database that receives information from the organisations operational data bases and other external sources. All this data is used to assist management in effective decision making and for the review of key performance indicators. Again management must ensure that appropriate backup, disaster recovery and business continuity plans are in place. It is also important that the data from the operational database is retrieved correctly, maintained and used wisely. Access controls need to be put in place to ensure access only by authorised persons and the duties between users needs to be segregated (Puttick, p.272).

2.7.3 The billing and debtors control information technology system

The revenue transaction is the means by which income is generated from a business activity (Puttick, p.355). The revenue transaction under consideration is that of the billing for services rendered, namely water and sanitation services as is the service that will be provided by the WSPU.

The billing and debtors control system needs to be designed in such a way that when audited, it is found to be providing results that are complete, valid in terms of

occurrence and accurate in terms of measurement. The revenue transactions are usually the most significant figures in the income statement, which give rise to material balances in the balance sheet (Puttick, p.357).

Control measures have to be provided for and consideration needs to be taken of the combined inherent risk and control risk. This risk of significant misstatement affecting revenue transactions must be assessed and appropriate steps provided for to prevent it from occurring especially where the risks are most significant.

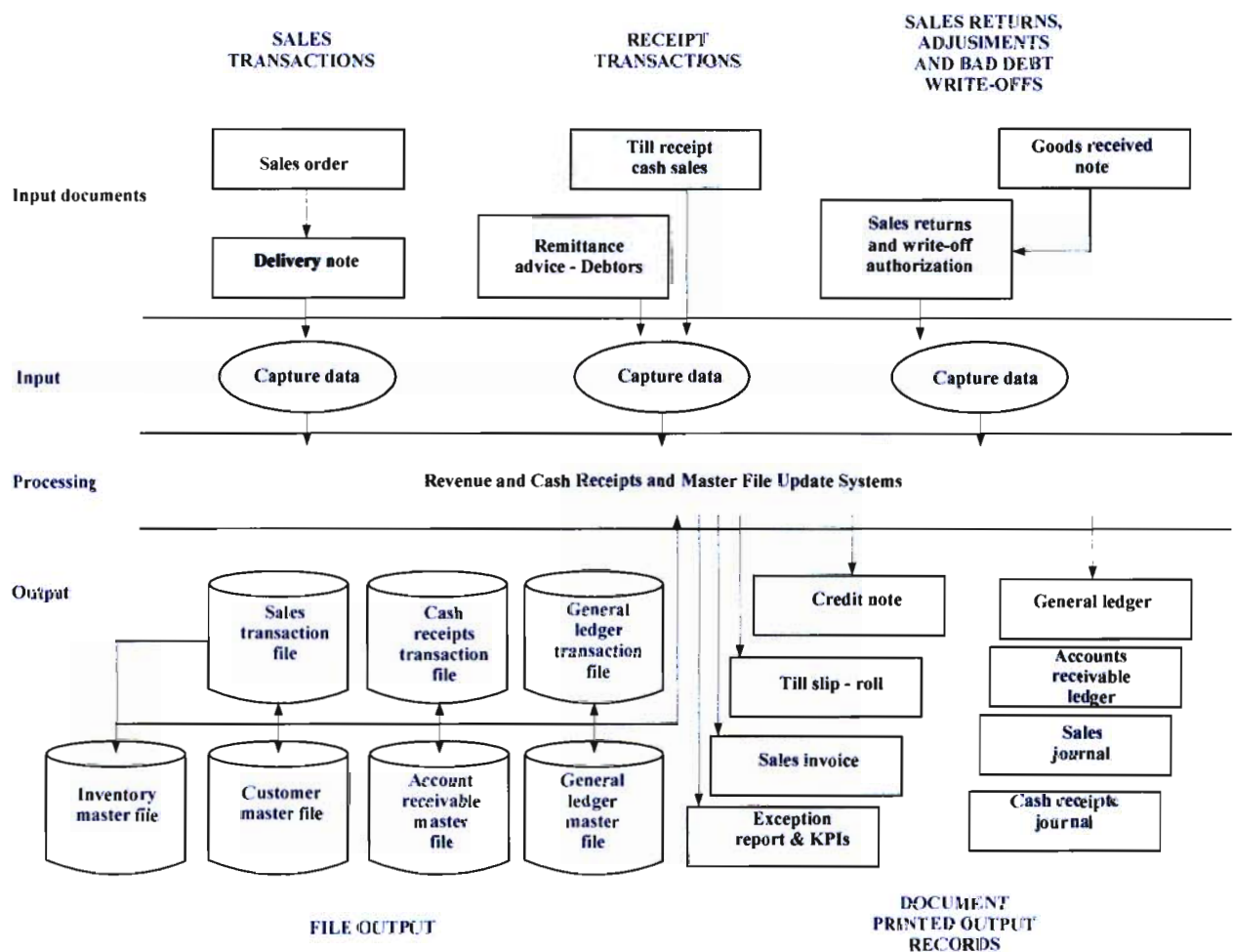
As the management of inventory and the need to ensure, at all times, that sufficient inventory levels are maintained so as to provide an effective service to the customer and avoiding over stocking. This needs to be managed correctly and be included in the financial system.

The information and communication system must provide for adequate documentation of the system, policies and procedures implemented for all aspects of the organisations revenue transactions. This should include all the inputs, processes and outputs ensuring the proper capturing of information into the accounting records. The system must also provide for the design of documentation for revenue transactions and the way in which the revenue is received and banked, the debt collection processes are performed and how the printouts of the transactions audit trail is produced (Puttick, p.366). The correct IT system needs to be sourced for the provision and application of the financial revenue transaction function and the system chosen must suit the environment in which it will be operating.

The key performance indicators (KPI's) that monitor the effective functioning of control activities over revenue transactions must be designed to detect and correct errors and fraud and other risks that may affect the success of the business. The KPI's may include external factors such as bank interest rate changes, and internal KPI's such as daily reports on the total revenue receipts and amounts banked for all the decentralised pay points that are proposed for the revenue collection for the services provided by the WSPU (Puttick, p.366).

An overview of the revenue process, utilising a computerised environment is as provided for below.

FIGURE 2: REVENUE PROCESS OVERVIEW UTILISING AN INFORMATION TECHNOLOGY environment (Adapted from Boynton WC, Johnson RN and Kell WG, Modern Auditing (7 ed.), John Wiley & Sons Inc USA 2001, page 576.), Sourced from (Puttick, p.367)



As mentioned previously documents will have to be designed specifically for the revenue transactions. The revenue transactions will further affect the functions that occur, the way in which they are recorded and the control mechanisms that are required to ensure that the transactions meet completeness, accuracy in measurement and the validity of occurrence. There are three revenue transactions that will be discussed namely credit sales transactions, cash receipts and sales transactions and sales adjustments.

In the municipal environment the provision of water and sanitation services is provided to the consumer for promises of future payment. Payment is received for the provision of services by way of cash and receipts received at the tills and from remittances received through the mail, sales adjustments may need to be made for incorrect meter reading or incorrect billing, and bad debts need to be written off. These above transactions constitute the transactions that will have to be performed in the receipt of revenue.

There is a risk attached to the receipt of cash before and after the recording thereof and strict security controls need to be implemented. This may be performed by using surveillance cameras and monitoring them, the use of drop safes, especially in the proposed rural decentralised pay points that will be established for the WSPU. Coin security companies should be contracted to collect and deliver drop safes to the banks and insurances carried to cover the possibility of the theft of these drop safes.

It is proposed that a computerised accounting system be procured for the performance of this function. The effectiveness of the control systems for complying with SAAS 4011 depends on general and application controls. The general controls include the higher level monitoring and detection controls that are included in policy and procedure that address management's considerations. The application controls are required specific to particular transaction processes.

Some common documents used for credit and cash sales and receipt transactions include a sales invoice, cash summary sheet and cash register tally rolls, remittance advices, remittance diary, electronic funds transfer advices received from the bank or the customer, photocopies of bank stamped deposit slips, bank stamped deposit slips prepared by the organisation, bank deposits, debit orders tape and printout receipts issued to credit customers, and monthly statements (Puttick, p.382). The documents must be designed ensuring that the organisations details, logo etc. are included, making the document clearly identifiable and meeting all legal requirements (Puttick, p.371). A sales transaction file should also be produced that provides a basis for maintaining sequence controls over invoices. This will be generated by the sales invoicing system that will update the accounts receivable ledger and general ledger sales and the accounts receivable control account. With a computerised system the

accounts receivable and the general ledger accounts are updated immediately as the transactions are captured and will be stored as an electronic file (Puttick, p.383).

The computer accounting records required for credit sales are a customer master file, which includes all the details of the customer, a pricing master file to record all cost associated to specific services including the cost of inventory , and an accounts receivable master file. This master file would contain a complete record of transactions with the customer and will provide an age analysis of all accounts receivable at any particular date. Other files would include the general ledger master file and the inventory master file (Puttick, p.372). The inventory mentioned will not actually be sold but will be charge for when utilised for performing a task, for which the consumer has requested (Puttick, p.373).

All the information regarding inventory including description, quantity in hand, as well as the date of inventory quantity received, returned or utilised must be available. The reports that must be produced by the computer software must be the list of consumers to be billed, the list of specific work performed for a customer for whom he/she must be billed and an accounts receivable age analysis report with details of each account. Other reports will include the general ledger trial balance, key performance indicators and exception reports. The key performance indicators will include items such as turnover of inventory balances, slow moving inventory, age analysis by the percentage of accounts receivable balances and outstanding debt recovery periods. The exception report would include a list of debtors who have exceeded their credit limits, a long outstanding accounts receivable balance and a list of missing sequential invoice numbers not yet processed to accounts receivable (Puttick, p.373).

Control must be in place to restrict the access to inventory prices and details of accounts receivable to certain senior staff, with changes only to be made by such officials.

There has been debate on whether it is constitutionally correct to perform credit checks of consumers that have a right to water and sanitation services.

Notwithstanding this it may become policy to determine the credit standing of

customers before any application for water connections are approved. This should be performed by simply accessing an on-line enquiry program. Credit limits could be set for customers with these details captured into the customers' master file and only authorised officials must have access to changes to this master file.

The invoicing of customers must be done in such a way ensuring that invoices are sent to the correct customer and that the correct amount is billed. It is important that all invoices are recorded in the general ledger and accounts receivable ledger in the correct accounting period. These procedures and controls can be built into the accounting program, ensuring that these assertions are met for every receipts transaction (Puttick, p.377). It should however be borne in mind that computers do make errors due to programming errors and the results must be checked for this.

The revenue recording function is the final stage and must have controls that ensure that receipts recorded relate to transactions that have occurred. The system should be an online real-time system and the updating of the accounts receivable and general ledger accounts should occur automatically as the transaction is captured.

A listing of the aged accounts receivable balances should be printed out and reviewed by the credit controller who is responsible for debt collection. The credit controller will identify customers who have exceeded their credit terms, and letters of demand must be sent out to these consumers. There must be a firm policy that provides for the handing over of customers who do not respond to the demand letters, to attorneys for collection. The age analysis provides management with good information on the effectiveness of debt collection procedures (Puttick, p.379).

Some indexes and ratios which can be utilised for the monitoring of the financial situation of the WSPU's activities are the following:

Indexes:

1. The number of debtors with payment in arrears (% of connections) (Correia, p.144).
2. The amount of money in arrears owed to the Municipality (Accounts receivable) (Correia, p.155).

3. Net profit percentage before tax and interest (Steyn, p.74).
4. Gross profit percentage (Steyn, p.75).
5. Administration expenses percentage (Correia, p.146).

Ratios:

1. Average Collection Period (We should strive for a 30 day collection period) (Correia, p.149).
2. In terms of inventory, the stock turnover can be monitored (Correia, p.148).
3. Gross profit margin (Correia, p.152).

2.8 POLICY FORMULATION

As a starting point in the formulization of policy it must be noted that all the users of water have a material interest in the policy development (Hessing, p.10). Users include industry; representation for domestic consumers, statutory institutions i.e. the Department of water affairs, local water utilities, local municipalities, local and neighbouring local government institutions. In the case of the above policies the actors would more accurately be defined as; a) those who would benefit from such a policy, b) those who would have to contribute financially towards such a benefit and c) those who are responsible for the governance, development and implementation of the policies.

It is believed that when considering the models that categorised the general pattern of development of policy, as highlighted by Hessing, that the model should be developed to ensure sustainable development (Hessing, p.15). Water and sanitation policy has to be developed and implemented in a sustainable manner where the principle of the triple bottom line needs to be adhered to. The triple bottom line includes for equity, efficiency and ecological integrity. Should we be able to address these three factors in our policy development then we should be enabling sustainable development.

As noted by Hessing there is a valuable tool available to give direction in the process to follow in policy development. The approach is a problem solving model that is aligned to various stages in the policy cycle. These processes are as mentioned previously namely:

<u>Phase of applied problem-solving</u>	<u>Stage in policy cycle</u>
(1) recognition of a problem,	(1) Agenda-setting
(2) proposal of a solution to the problem,	(2) Policy formulation
(3) choice of a solution,	(3) Decision-making
(4) putting the solution into effect, and	(4) Policy implementation
(5) monitoring the effects of the solution upon the problem.	(5) Policy evaluation

(Hessing, p.97)

By using these processes one is able to see how each of the decisions involved in the public policy-making are made, which is a more or less transparent decision making environment (Hessing, p.99).

The first stage in the process being Agenda setting is where an issue or problem is regarded as important enough to have to be addressed as one issue amongst many issues that takes preference for what ever reason.

As defined by John Kingdon, “the agenda is the list of subjects or problems to which governmental officials, and people outside of government closely associated with those officials, are paying some serious attention at any given time... Out of the set of all conceivable subjects or problems to which officials could be paying attention, they do in fact seriously attend to some rather than others. So the agenda-setting process narrows this set of conceivable subjects to the set that actually becomes the focus of attention.” (Hessing, p.107).

In the development of policy we would have to look at the actors that were responsible for raising these issues to the forefront and promoting its development. The actors that are involved in agenda setting could be Government, productive interests, organised labour and civil society outside of government (Hessing, p.112).

It must however be noted that where human resources expertise are limited, that from this initial stage, the actors will have to start thinking in way of how such a policy will be implemented and establish which actors are likely to be involved throughout the

entire process from development to implementation and evaluation. The issue needs to be addressed by local government in the most appropriate way.

The second stage being the formulation stage it is necessary to find solutions to the problems, and the correct solutions are arrived at when the problem has been defined correctly (Hessing, p.136).

Once the actors of the formulation process have arrived at all the possible solutions they will have to make decisions as to which solutions must be adopted. The actors will most probably be the politicians in the case of government and will be guided by the other actors represented in the policy development team.

In the decision making stage one would base ones decision on either a rational approach, which reduces the issue down to a technical exercise, or on an incremental model that makes a modest adjustment to an existing practice (Hessing, p.157).

Decisions are made in different stages of the policy cycle process. The decisions range from the enactment of legally binding and sanctioned legislation and the proclamation of official government policy to meet campaign promises and informal statements of politicians (Hessing, p.156). It must be noted that not all legislation is policy and not all policy is legislation.

Decision making should not be seen as a self-contained stage but essentially a process. It is further noted that decision making is partly a technical exercise and is inherently a political process (Hessing, p.157). The process hopefully will draw on expertise in the decision making and therefore decision making includes both technical and political aspects.

In the policy implementation stage there are various styles that are used. To a great extent one needs to map and see who is likely to be involved with the implementation process. One needs to see what mechanisms are available for the implementation of the policy. One mechanism is the use of laws and regulations e.g. Common law and new laws that replace common law (Hessing, p.175). For this model one would have to determine what resources you have at your disposal. One would have to choose a

model that takes into account the available capacity to implement such a policy. How would one encourage compliance of regulations if one does not have the resources to perform the function? Resources required to enforce compliance would include for administrative agencies, tribunals and hearings for example (Hessing, p.176).

One can also have voluntary forms of implementation and incentive based implementation models. For this model less in-house capacity would be required and it would be easier to get compliance with fewer resources, should it not be available. It may also prove beneficial to improve customer service on a specific policy implementation which may make it easier for the public to comply with the requirements of policy.

There are some limitations that one may experience in implementing policy which are the difficulty of acquiring information, the limitedness of available data and not being able to determine risk etc. (Hessing, p.178)

A big factor is the lack of effective enforcement. If the cost to ensure compliance is high then it does not receive the priority required. Another factor in the lack of enforcement is the non co-ordination between organizations and government departments regarding the enforcement of common and different policies. (Hessing, p.183) The more people involved, the more expertise there is and the more co-ordination is required, which makes things difficult to implement.

In the fifth stage, namely the policy evaluation stage evaluation can be set up to evaluate and monitor the implementation and success of the policy. It must be noted that should one develop a rigid evaluation format then one can be setting oneself up for failure. Adjustments may be required to improve the evaluation process. Evaluation is essentially a tool utilized to make adjustments to policy, to make it more effective and to include for possible new issues that have arisen that were not included in the initial formulation of the policy (Hessing, p.195).

CHAPTER THREE

3. REVIEW OF THE CONTEXTUAL LITERATURE FOR THE REENGINEEING OF A CUSTOMER SERVICE ORGANISATION

As required from a theoretical point of view and as provided in Chapter 2, it is also required that a model framework of an organizational structure be based on contextual literature so as to ensure that the models developed will actually suit the environment in a contextual manner. It was necessary that investigations be performed into the contextual literature with which the model that would be developed utilizing theory could be correctly channeled and refined so as to achieve a model that would work in the current context. Much contextual literature was available for review as investigations had already been performed on the status quo of the municipal water and sanitation infrastructure and the demographics of the area. This assisted greatly in realizing the correct perception of the current situation.

Information on the legislative requirements provided guidance as to how service delivery was to be provided, and to some degree how the organization was to be structured. It also ensured the availability of contextual information in terms of the status quo on the financial, institutional and technical position that the municipalities find themselves in, as provided in the section 78 assessment, status quo document.

This chapter shares some light into the requirements in terms of context on the organizational structures, operational information technology systems and infrastructure that will be required for the establishment of the WSPU.

3.1 LEGISLATIVE REQUIREMENTS

3.1.1 Municipal Structures Act, No 117 of 1998

Under this act it is necessary to highlight that the responsibility of bulk water supply in the urban and rural areas, and the bulk sewage purification works and main sewage disposal that affects a significant proportion of municipalities within its boundary, in terms of Section 84 (1) (b) and (d) of the Municipal Structures Act No. 117 of 1998,

now resides by default with the District Municipality within which these areas reside (Republic of South Africa, 1998a, p.18).

The above section stands subject to any adjustment made by the Minister under section 84(3) of the Structures Act, and as such the uMDM is the WSA for the local Municipal area.

As a result of the second Section 84(3) Notice, the minister repealed the previous Section 84(3) Notice, which resulted in the constitution of the uMDM as the WSA for the entire local municipality area; required uMDM to acquire the administrative unit from the Local Municipalities within its jurisdiction; and assigned the date of 1st July 2003 upon which the uMDM was required to assume the WSA function in the place of the Local Municipalities.

3.1.2 Municipal Systems Act No. 32 of 2000

In terms of part 2 of chapter 8 of the Municipal systems act, the uMDM is required to perform a detailed investigation into the way it proposes to provide water services.

In terms of Section 76(a) the uMDM may provide a municipal service in its area or a part of its area through an internal mechanism, which may be

- (i) a department or other administrative unit within its administration;*
- (ii) any business unit devised by the municipality. provided it operates within the municipality's administration and under the control of the council in accordance with operational and performance criteria determined by the council; or*
- (iii) any other component of its administration*

(Republic of South Africa, 2000, p.70 & p.72)

In this process of investigating what mechanism is to be adopted, the uMDM must in terms of section 77, review and decide on the appropriate mechanism to provide a municipal service. This must be performed when preparing or reviewing its integrated development plan; when a new municipal service is to be provided and when the municipality is restructured or reorganised in terms of the Municipal Structures Act (Republic of South Africa, 2000, p.72).

When a municipality is deciding on what mechanism to adopt in the provision of municipal services in terms of section 77 above then there are some assessments that firstly have to be done. In performing the assessment it is necessary, in terms of subsection (1) of section 78, that the following be assessed for the uMDM:

- i) the direct and indirect costs and benefits associated with the project if the service is provided by the municipality through an internal mechanism, including the expected effect on the environment and on human health, well-being and safety;*
- ii) the municipality's capacity and potential future capacity to furnish the skills, expertise and resources necessary for the provision of the service through an internal mechanism mentioned in section 76(a);*
- iii) the extent to which the re-organisation of its administration and the development of the human resource capacity within that administration, as provided for in sections 51 and 68 respectively could be utilised to provide a service through an internal mechanism mentioned in section 76(a);*
- iv) the likely impact on development, job creation and employment patterns in the municipality; and*
- v) the views of organised labour.*

(Republic of South Africa, 2000, p.72)

The municipality may take into account any developing trends in the sustainable provision of municipal services generally.

In terms of subsection (2) and after having applied subsection (1), a municipality may

- (a) decide on an appropriate internal mechanism to provide the service; **or***
- (b) before it takes a decision on an appropriate mechanism, explore the possibility of providing the service through an external mechanism mentioned in section 76(b).*

(Republic of South Africa, 2000, p.74)

In terms of subsection 2(a) above, the uMDM has taken the decision to provide the water and sanitation provision service by means of an internal mechanism and

therefore the performance of further investigation of the possibility of utilising an external mechanism in terms of subsection 2(b) above is not required.

As the internal mechanism for the provision of water and sanitation services for the uMDM has been adopted, the provisions of section 79 will apply.

Section 79 states that if a municipality decides to provide a municipal service through an internal mechanism mentioned in section 76(a), it must:

- (a) allocate sufficient human, financial and other resources necessary for the proper provision of the service; and*
- (b) transform the provision of that service in accordance with the requirements of this Act.*

(Republic of South Africa, 2000, p.74)

3.1.3 Water Services Act No. 108 of 1997

The Act in terms of section 6, 7 and 22 specifically prohibits any organisation other than a water services provider to provide water services. A water services provider may be a WSA itself in terms of section 19(1)a or it may be another agency appointed by the WSA, under a contract and in terms of section 19(1)b(i), or by way of a joint venture with another WSA as provided for in section 19(1)b(ii).

In sub-section 19 1(a) of the act allowance is made for the water services authority to perform the function of a water service provider itself.

It is important to mention that in terms of Section 20 (1) of Water Services Act No. 108 of 1997 that when the WSA is performing the function of a water services provider, the water services authority must manage and account separately for those functions (Republic of South Africa (1997), p.24). From the above extract it is clear that the current WSA component cannot both manage the water services provision for the uMgungundlovu District Municipality and govern its operations in terms of legislation. This separation of functions will ensure proper monitoring and functioning for the provision of water and sanitation services. The water services authority is therefore required to ensure that the reporting and accounting for the provision and authority is separated.

Section 9(1, 2 & 3) of the Water Services Act No. 108 of 1997 provides for compulsory standards that may be prescribed by the minister, relating to the following as quoted from the Act:

9.(1) The Minister may, from time to time, prescribe compulsory national standards relating to:

(a) the provision of water services;

(b) the quality of water taken from or discharged into any water services or water resource system;

(c) the effective and sustainable use of water resources for water services;

(d) the nature, operation, sustainability, operational efficiency and economic viability of water services;

(e) requirements for persons who install and operate water services works; and

(f) the construction and functioning of water services works and consumer installations.

(2) The standards prescribed under subsection (1) may differentiate between-

(a) different users of water services; and

(b) different geographic areas, taking into account, among other factors, the socio-economic and physical attributes of each area,

(3) In prescribing standards under subsection (1), the Minister must consider

(a) the need for everyone to have a reasonable quality of life;

the need for equitable access to water services;

(Republic of South Africa (1997), p.16)

3.1.4 Compulsory National Standards under Section 9(1) of the Water Services Act, 1997 (Act 108 of 1997)

The relevant regulations to be discussed are the compulsory national standards under Section 9(1) of the Water Services Act, 1997 (Act 108 of 1997). These regulations are as provided for in the Government notice No. 22355 dated 8 June 2001.

These standards needed to be complied with by June 2003, two years after the promulgation of these regulations. There are a number of standards but only some

particular standards that are more relevant to the operations and maintenance of infrastructure will be highlighted. The regulation as mentioned below are quoted from the regulations relating to compulsory national standards and measures to conserve water.

Basic water supply

Section 3 of the standards provide the minimum standard for basic water supply services, which are as follow:

- a) the provision of appropriate education in respect of effective water use; and*
- b) a minimum quantity of potable water of 25 litres per person per day or 6 kilolitres per household per month*
 - i) at a minimum flow rate of not less than 10 litres per minute;*
 - ii) within 200 metres of a household; and*
 - iii) with an effectiveness such that no consumer is without a supply for more than seven full days in any year.*

(Republic of South Africa (2001), p.4)

Section 4 of the standards provide for interruption in provision of water services as follows:

A water services institution must take steps to ensure that where the water services usually provided by or on behalf of that water services institution are interrupted for a period of more than 24 hours for reasons other than those contemplated in section 4 of the Act, a consumer has access to alternative water services comprising:

- a) at least 10 litres of potable water per person per day; and*
- b) sanitation services sufficient to protect health.*

(Republic of South Africa (2001), p.4)

Section 12 of the standards provide for repair of leaks as follows:

A water services institution must repair any major, visible or reported leak in its water services system within 48 hours of becoming aware thereof.

(Republic of South Africa (2001), p.9)

Section 16 of the standards provide for reporting of non-compliance as follows:

A water services institution must have a consumer service to which non-compliance with these regulations can be reported.

(Republic of South Africa (2001), p.11)

Section 5 of the standards provide for the quality of potable water as follows:

- 1) Within two years of the promulgation of these Regulations, a water services authority must include a suitable programme for sampling the quality of potable water provided by it to consumers in its water services development plan.*
- 2) The water quality sampling programme contemplated in sub regulation (1) must specify the points at which potable water provided to consumers will be sampled, the frequency of sampling and for which substances and determinants the water will be tested.*
- 3) A water services institution must compare the results obtained from the testing of the samples with SANS 241: Specifications for Drinking Water, or the South African Water Quality Guidelines published by the Department of Water Affairs and Forestry.*
- 4) Should the comparison of the results as contemplated in sub regulation (3) indicate that the water supplied poses a health risk, the water services institution must inform the Director-General of the Department of Water Affairs and Forestry and the head of the relevant Provincial Department of Health and it must take steps to inform its consumers*
 - a) that the quality of the water that it supplies poses a health risk;*
 - b) of the reasons for the health risk;*
 - c) of any precautions to be taken by the consumers; and*
 - d) of the time frame, if any, within which it may be expected that water of a safe quality will be provided.*

(Republic of South Africa (2001), p.5)

The question to be answered is what is the uMgungundlovu District Municipality doing to be able to meet the requirements of the regulations in terms of human resources or staff requirements and reporting systems so as to be able to respond appropriately to problems with the supply of potable water, that may arise?

3.1.5 Financial legislation

It must be noted that there is legislation governing the procurement and installation of information technology systems.

In terms of Section 76 (4) (c) of the Public Finance Management Act (PFMA), 1999 (Act No. 1 of 1999 as amended by Act 29 of 1999), the Minister of finance approved the Regulations in respect of the Framework for Supply Chain Management in December 2003 (Republic of South Africa (1999), p.40).

Section 6.3.e of the Framework for Supply Chain Management states that “contracts relating to information technology are prepared in accordance with the State Information Technology Act, 1998 (Act No. 88 of 1998), and any regulations made in terms of that Act (Republic of South Africa (2003b), p.6).

In terms of section 111 of the Municipal Finance Management Act, 2003 (Act No. 56 of 2003) a model policy was produced to comply with the supply chain regulations published in gazette 27636 on 30 May 2005, and stated the following in sections 31. (1 to 4):

“Procurement of IT related goods or services

31. (1) The accounting officer **may** request the State Information Technology Agency (SITA) to assist with the acquisition of IT related goods or services through a competitive bidding process.
- (2) Both parties must enter into a written agreement to regulate the services rendered by, and the payments to be made to, SITA.
- (3) The accounting officer **must** notify SITA together with a motivation of the IT needs if –
- (a) the transaction value of IT related goods or services required in any financial year will exceed R50 million (VAT included); or
 - (b) the transaction value of a contract to be procured whether for one or more years exceeds R50 million (VAT included).

(4) If SITA comments on the submission and the municipality disagrees with such comments, the comments and the reasons for rejecting or not following such comments must be submitted to the council, the National Treasury, the relevant provincial treasury and the Auditor General.”

(Republic of South Africa (2005b), p.29)

In terms of section 6 of the State Information Technology Act, 1998 (Act No. 88 of 1998), “the objective of the Agency is to provide information technology, information systems and related services in a maintained information systems security environment to, or on behalf of, participating departments and organs of state and in regard to these services, act as an agent of the South African Government” (Republic of South Africa (1998e), p.8).

Under the subtitle “Powers and functions of Agency”, section 7(g) the following is stated, “with regard to any of the above functions act as procurement agency in respect of information technology requirements, in accordance with State procurement policy” (Republic of South Africa (1998e), p.8).

It is further stated in section 21(1) & 21(2), with regard to intellectual property that “Despite any provision in any other law, all intellectual property rights, in any product, service, item, method or any other thing of any nature vested in any participating department or organ of state relating to information technology or information systems will vest in the Agency, and “The Board of Directors is empowered to direct how such product, service, item, method or any other thing of any nature is to be utilised by the Agency in the achievement of its objective” (Republic of South Africa (1998e), p.16).

From the above extracts of legislation reference is made to the Municipal finance management act (MFMA), which states that the organ of state, and in this instance the uMDM, *may* request the SITA to assist with the acquisition of IT related goods or services through a competitive bidding process and for goods or services with a monetary value less than R50 million (VAT included) would not have to notify SITA.

In terms of the Regulations in respect of the Framework for Supply Chain Management, as required by the PFMA, contracts relating to information technology are to be prepared in accordance with the State Information Technology Act, 1998 (Act No. 88 of 1998), and any regulations made in terms of that Act. The State Information Technology Act states that all procurement of information technology requirements will be done in accordance with State procurement policy.

As one focused on the word “may” utilised in the MFMA it is hence deduced that an organ of state does not have to utilise SITA or notify them of any procurement of information technology requirements should the anticipated expenditure be less than R50 million, however the State procurement policy in terms of the State Information Technology Act would have to be adhered to, as in any event it would be followed by an organ of state. The uMDM therefore has an option to utilise SITA, should it want to, and could very well use their internal resources. This would be decided by the accounting officer.

3.2 STATEMENT OF CORPORATE GOALS AND STRATEGIES

Before any model framework can be developed for the reengineering process it is necessary to understand the vision and mission of the organisation. It is necessary that any proposed reengineering be performed in synergy with the vision and mission of the organisation (Hunter, C, p.78). The vision and mission of the uMDM are as follows:

The vision of the uMDM is that it will evolve into a dynamic Metropolitan area, spreading its vibrant economic benefits to all its citizens and places and will, through concerted integrated development and service delivery, realise improvements in the overall quality of life. The mission is supportive in that the uMDM will through sound governance and community participation ensure the provision of equitable and sustainable services and economic growth (uMDM IDP, p29).

For the WSPU to be in synergy with the vision of the organisation, the model framework must be aligned likewise in terms of organisational structure, financial and reporting systems and operational considerations. It was therefore proposed that the vision and mission of the WSPU establishment be as follows:

The vision of the WSPU is to evolve into a unified and functionally integrated services unit, to be able to provide water and sanitation services to our customers, improving quality of life to all. The supportive mission of the WSPU is to provide water and sanitation services to our customers in a manner that conforms to the standards and regulations for water and sanitation service delivery, which will improve customer service and ultimately ensure economic growth in our District.

3.3 DEVELOPMENT OF A MODEL FRAMEWORK IN TERMS OF ORGANISATIONAL STRUCTURE

In this scenario there happens to be some metropolitan cities that have achieved the vision and mission similar to the uMDM or who are well on the way to achieving it. The neighbouring Metropolitan to the uMDM namely the eThekweni Metro and the Cape Town Metro are examples of Metropolitan areas which can be utilised in the benchmarking process. In no way should it be interpreted that the choice to utilise these two Metropolitan cities demeans the achievements made by any other Metropolitan cities that have not been referred to in this paper.

The environment in which the uMDM find themselves has some similarities to that of the successful eThekweni Metropolitan area, however are much smaller in scale and therefore the structure and the number of personnel required will be significantly downsized. The basic concepts of required personal and the functioning of the eThekweni Municipality is somehow similar with the attributes of centralised control of decentralised offices and depots, which is proposed for the uMDM.

Further contextual information regarding the organisational structure is as provided in the section below on the review of the section 78 assessment for the uMDM.

3.4 REVIEW OF THE SECTION 78 ASSESSMENT

A section 78 assessment status quo report and a professional comment report was produced by UWP Consulting engineers in May 2004 and October 2004 respectively whereby the entire uMDM including each Local Municipality were investigated in terms of their demographic profile; the physical assets, organisational structure, staffing, legal issues and costs of services within the above mentioned areas (UWP

(2004a); UWP (2004b). It must be noted that the investigation was performed in the year 2004, which is two years prior to this report and therefore caution must be exercised in its interpretation. Where the researcher is aware that information provided in this status quo report is incorrect in terms of the current situation, it will not be included in this review but will correctly be provided in the findings of this dissertation.

There is a need to reform the water services provision function within the uMDM for a number of reasons as follows:

- The current local municipalities that are performing the WSP function are not all financially viable.
- There is increasingly less invested on the maintenance and rehabilitation of infrastructure due to poor revenue collection and rising costs.
- The debt that local municipalities have is high and the debt collection periods are unacceptable.
- The ability of some local municipalities to receive loans is weak due to their high debt, which prohibits the local municipalities to expand and sustain water services infrastructure. A financially strong WSP is required.
- Most of the municipalities do not have the necessary staff capacity to effectively provide the operations, maintenance and provision function.
- The institutional framework is highly fragmented which results in the loss of opportunity of economies of scale and other efficiencies in terms of institutional arrangements (UWP (2004b), p.8 –p.9).

The following is an overview of the various aspects of the assessment in terms of the status quo and the professional comment report.

3.4.1 Demographics and Service level coverage

The conclusions of the demographics and service level coverage investigation were that the uMDM has adequate water resources to provide for the entire population of the district; however the impounding of water is necessary. In terms of service levels, the scattered settlements in the rural tribal areas are under serviced. It was estimated

that approximately 42% of the population has a less than sufficient water supply and approximately 60% of the population has less than sufficient sanitation provision (UWP (2004b), p.12). These areas can be serviced in the interim by way of spring protections and boreholes.

It is estimated that approximately 54% of the population are indigent and therefore there is a need for high subsidisation of water services provision. Funding would be required in terms of grant funding and cross subsidisation from the urban sector to provide for the indigent population (UWP (2004a), Section 1 p.17). It is estimated that 46% of the households within the uMDM will be able to pay for their services (UWP (2004b), p.12).

3.4.2 Physical water and sanitation assets

The conclusions of the investigation into the physical water and sanitation assets it was established that Umgeni Water, being the major bulk water supplier provides approximately 90% of all the potable water to the district. There are a number of water supply distribution network schemes that are being transferred to the uMDM for which the WSP's will have to operate and maintain. The bulk water provision to these distribution networks will remain with Umgeni water and they will supply the uMDM schemes that are linked to these bulk networks with treated potable water. The uMDM will be financially responsible for the operation and maintenance of the schemes and the WSP's will be responsible for the physical operation, management and refurbishment of the schemes (UWP (2004b), p.16).

The details of the water reticulation infrastructure as provided in the section 78 assessment, status quo and professional comment document for each local municipality was as follows:

The *uMshwathi local municipality* has the ability to be made responsible for the maintenance and administration of all water distribution in its area. They would also be able to operate the two sewage treatment plants in their area; however they do require assistance from the district in terms of additional staff, plant and equipment. The municipality has a number of urban water and sanitation schemes which they currently operate and maintain and are actually also responsible for the rural schemes

in terms of the agreement, however there is a misunderstanding with regard to this agreement. On finalisation of the WSP arrangements for this area, the WSP will be responsible for the entire water and sanitation infrastructure in the area.

The infrastructure in this area comprises bulk reticulation and distribution networks. Most of the bulk reticulation is monitored by Umgeni Water using a radio frequency telemetry system. The bulk lines that are within the Swayimane area are currently not equipped with a telemetry system.

There is a large backlog in terms of services delivery in this area and a 95% indigent population, which will require substantial subsidisation. In terms of infrastructure, there is a great need to address this area and implement new projects and extend existing infrastructure (UWP (2004a), Section 2 p.2 - p.18; UWP (2004b), p.16 - p.17).

The uMngeni, Mpofana and Richmond local municipalities administer and maintain the water and sanitation infrastructure in their areas. Their offices are acceptable and the status quo could remain, with the district assisting with the provision of resources where required. The sewage treatment works in uMngeni is currently being managed and operated by the Umgeni Water utility and this should remain in force until the end of the contract. The sewage treatment works in Mooi River (Mpofana local municipality) does not have a qualified operator assigned to it and therefore will require assistance from the district in the provision of staff for this purpose.

The Richmond and Mpofana local municipalities both have water and sanitation treatment works and rural water supply schemes that have to be operated. The uMngeni local municipality sources water from the Umgeni water utility.

There is approximately a 15%, 32% and 60% back log in terms of infrastructure required within the uMngeni, Mpofana and Richmond local municipalities respectively that will have to be met to achieve a minimum service delivery provision to these municipalities. The uMDM will be responsible for the provision of this infrastructure, with the WSP's having to operate and maintain this additional infrastructure when provided for (UWP (2004a), Section 2 p.2 - p.18; UWP (2004b),

p.17). The local municipalities currently have small water treatment plants that provide water to the various rural water supply schemes in the area.

The Impendle local municipality has very little infrastructure at present and requires very little management. The municipality can be managed from the existing offices and more resources provided for by the district as and when required. The backlogs, in terms of the professional comment report reflect that there is a 35% backlog. In consideration of this information it is the opinion of the researcher, after having worked in this area that the backlog is more in the region of 60%. There is still a considerable amount of infrastructure that will be required in this area for which the WSP will have to be established to operate, maintain and refurbish and therefore the resources available at this municipality will have to be increased significantly, should they be appointed as a WSP (UWP (2004a), Section 2 p.2 – p.18; UWP (2004b), p.17).

The Mkhambathini local municipality manage and maintain their infrastructure by way of a support services agent, namely Umgeni Water. The municipality could remain responsible for the provision of water and sanitation services in its area. There are plans to extend the infrastructure by way of large rural schemes and will require additional resources at this time. The current Umgeni Water staff could be transferred to this municipality, which would be adequate for the short term. There is an estimated 54% backlog in this area which will have to be addressed in terms of a regional scheme. The increase in this infrastructure will require a fully fledged WSP to operate and maintain it as the source of water will be provided by Umgeni water to approximately 125Km of bulk water reticulation, supplying the distribution networks in the area, which is a substantial amount of infrastructure to have to maintain.

The uMDM could adopt the option of devolving the provision of water and sanitation services to the local municipalities and provide professional and financial assistance as and when required. It was proposed that the future services of Umgeni Water be further investigated (UWP (2004a), Section 2 p.17-p.18).

A summary of the water and sanitation infrastructure excluding existing VIP type toilets is as follows:

TABLE 2: NUMBER OF WATER SCHEMES AND WATER SEWAGE TREATMENT PLANTS WITHIN THE UMDM (UWP (2004a), Section 2 – Amended)

	NO. WATER SCHEMES	WATER TREATMENT PLANTS	SEWAGE TREATMENT PLANTS	HIGH LEVEL OF SERVICE SUPPLY
LOCAL MUNICIPALITY	URBAN / PERI-URBAN WATER AND SANITATION			
UMSHWATHI	13	2	3	12
UMNGENI	9	1	2	9
MPOFANA	3	2	1	3
IMPENDLE	2	1	0	2
MKHAMBATHINI	6	0	1	6
RICHMOND	8	2	1	8
SUB TOTAL	41	8	8	40
	RURAL WATER AND SANITATION			
UMSHWATHI	11	2	1	6
UMNGENI	2	0	0	0
MPOFANA	5	0	0	0
IMPENDLE	15	2	0	0
MKHAMBATHINI	7	0	0	4
RICHMOND	5	0	0	1
SUB TOTAL	45	4	1	11
TOTAL	86	12	9	51

A map showing the geographical location of the water and sanitation supply schemes is as provided in Fig. 3 below. This will assist the reader in identifying the magnitude of the operational area related to the location of water supply schemes, in spatial terms.

3.4.3 Institutional arrangements

An investigation was done on all the local municipalities regarding their institutional arrangements and whether they were in a position to act as a water services provider on behalf of the uMDM.

3.4.3.1 uMshwathi Local Municipality

At the time of the investigation there were 12 employees employed in the water and sanitation section of the municipality, however there was no technical manager appointed at the time. It was concluded that the uMshwathi municipality had the staff capacity to provide water and sanitation services to the five towns in uMshwathi, however assistance would be required in providing additional human resources when the rural schemes are transferred from Umgeni water to the District municipality. Further support would also be required for the finance department as they were being assisted by a service agent regarding this. Attached in Appendix A, is the organogram denoted as Fig. 6 indicating the staffing structure for the uMshwathi municipality at the time of the investigation (UWP (2004a), Section 3 p.16).

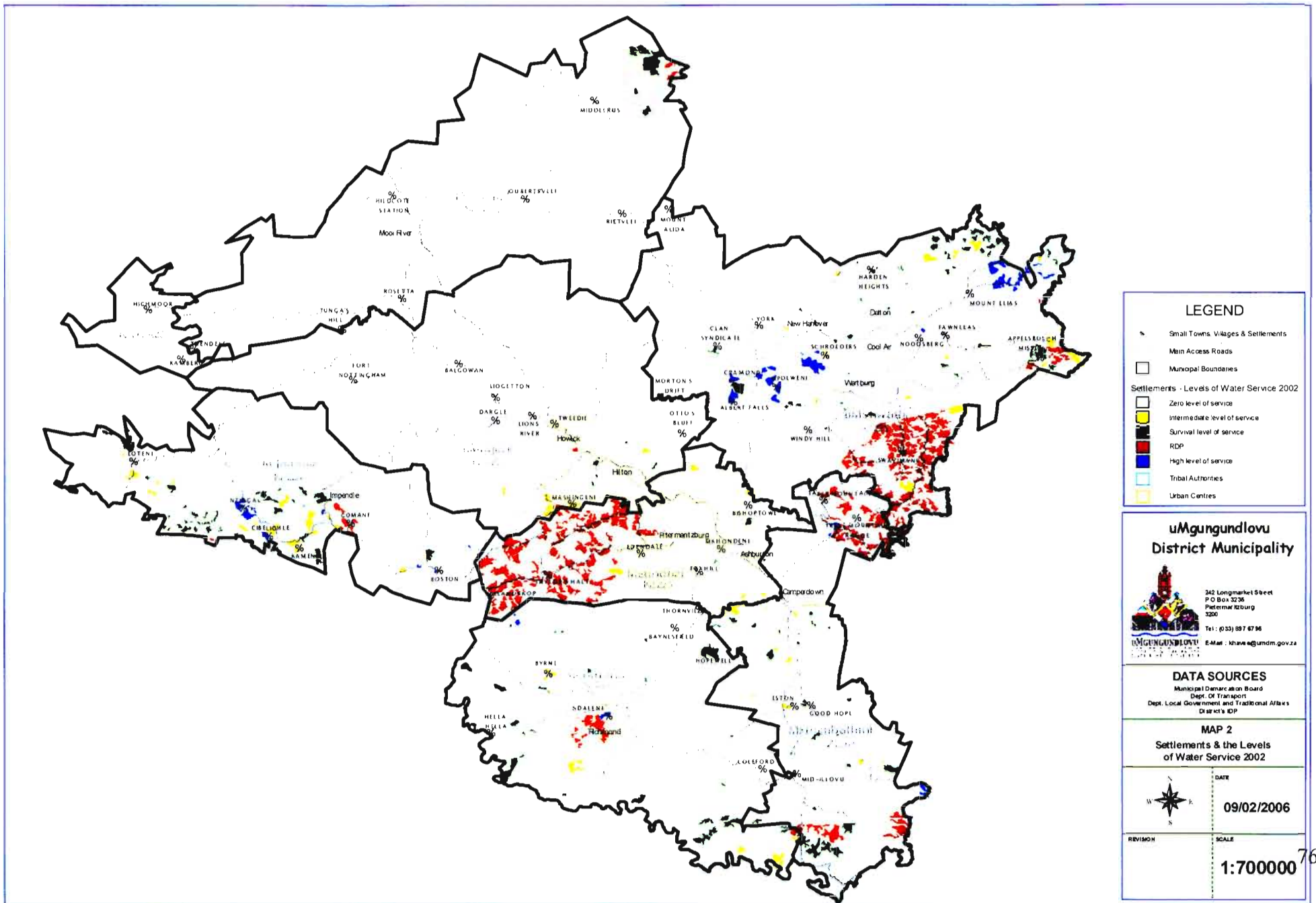
3.4.3.2 uMngeni Local Municipality

At the time of the investigation there were 14 employees employed and 11 vacant posts in the water and sanitation section. This figure excluded water meter readers and cashiers that fell under the finance department. The meter readers were assigned to read both the water and electrical meters and therefore these staff would probably not be transferred to the district should an internal mechanism be adopted. No job descriptions existed for the posts, but staff members were undertaking a job analysis questionnaire. The organogram of the uMngeni municipality is as attached in Appendix A as Fig. 7 (UWP (2004a), Section 3 p.16-p.17).

3.4.3.3 Mpofana Local Municipality

There were 11 employees employed in the water and sanitation section of the Mpofana municipality. There was a technical manager, 4 plumbing supervisors, 4 general assistants and a number of meter readers. The local municipality now has to service areas outside of its previous area and do not have sufficient staff and has thought of possibly contracting a service agent to assist in these areas. The technical staff are suitably qualified and able to perform their tasks. The cashiers at the local municipality work on various services and not only on the water and sanitation service. The organisational structure is as attached in Appendix A as Fig. 8 (UWP (2004a), Section 3 p.17).

FIGURE 3: GEOGRAPHICAL AREA OF THE UMGUNGUNDLOVU DISTRICT MUNICIPALITY SHOWING THE SETTLEMENTS AND LEVEL OF WATER SERVICES (Source: uMgungundlovu District Municipality- GIS Department)



3.4.3.4 Impendle Local Municipality.

There are no staff that have been specifically allocated to water and sanitation services. The local municipality has vacant positions in its organogram for staff to be assigned to the water and sanitation function. The staff that do work in the section are; one meter reader / Forman, and a chief technical officer. The job descriptions for the posts have not been finalised and most of the positions are vacant and the cashiers are not directly allocated to the water and sanitation provision service. It was the opinion of the consultants that additional capacity was required by the Impendle local municipality should they function as a water services provider.

Some cashiers are working from local water committee offices, employed as part of the water scheme by the relevant implementing agents. All their salaries are paid by the Impendle municipality but are not on the municipalities pay roll. These staff need to be absorbed into the water services provision unit. The staffing structure for the municipality is as attached in Appendix A as Fig. 9 (UWP (2004a), Section 3 p.17 – p.18).

3.4.3.5 Mkhambathini local Municipality

The technical department perform all the technical functions for the municipality and the water services provision has not been ring fenced. Due to the lack of human resources, the local municipality has contracted a service agent namely Umgeni Water to provide the operations and maintenance of its water schemes. The technical manager is the only employee of the municipality who is responsible for the function in terms of water and sanitation services provision. The staffing structure for the municipality is as attached in Appendix A as Fig. 10 (UWP (2004a), Section 3 p.18).

3.4.3.6 Richmond local Municipality

The municipality had finalised their staffing structure at this time and it must be noted that the staff only served the village on aspects of water services. No job evaluations or job descriptions have been finalised for the posts in the organisation. There were 10 vacant posts in the organogram that needed to be filled to enable the local municipality to function as a water services provider. The permanent staff under the technical services manager are experienced and are capable of fulfilling their role.

There are a number of staff that are required for the operations and maintenance of schemes that were implemented by implementing agents appointed by the uMDM, that will have to be transferred to the local municipality should they perform the operations and maintenance on these water schemes.

Additional staff and equipment will therefore be required by the Richmond municipality for the operation and maintenance of water schemes outside of the Richmond town. With the addition of these resources, the municipality will be able to perform the function of water services provision.

There was at the time 4 administration staff and 9 operators that are assigned to the schemes that were implemented by the implementing agents. These staff are paid by the Richmond municipality on behalf of the uMDM as an interim caretaker arrangement. The local municipality do not have sufficient staff to undertake the required provision work and will not be employing anymore staff until the water services provider arrangements have been finalised. The Richmond municipality was at the time undertaking a job description exercise (UWP (2004a), Section 3 p.18 - p.20). The staffing structure for the municipality is as attached in Appendix A as Fig. 11.

3.4.3.7 uMgungundlovu District Municipality

No staff were employed by the uMDM at the time of the investigation for the water and sanitation services provision function. There are 34 staff members that are to be transferred to the uMDM from the Umgeni Water RAWSP schemes. The municipality is in the process of finalising its staffing structure as attached for reference in Appendix A as Fig. 5.

The issue of staff from the local municipalities who were being paid salaries by the uMDM but seen to be employed on a contract basis by the local municipalities needs further investigation. The uMDM does not have an administrative unit geared to provide a water services provision function. The sustainability of the administrative units within certain local municipalities may be affected if the water and sanitation provision function is discontinued with the local municipality and assigned to another institution, as they will not be involved with the collection of revenue for water and

sanitation services (UWP (2004a), Section 3 p.20)

A decision is required by the uMDM regarding future WSP arrangements, to allow for the finalisation of individual staff contracts and the potential transfer of staff to the WSP. A skills audit needs to be performed on all staff and their training requirements identified. This will further be used to assist in the grading of staff and the allocation of them to appropriate posts in the proposed WSP staffing structure (UWP (2004b), p.32).

3.4.4 Financial assessment

As stated in the status quo report the information system of the municipalities does not provide adequate information on the water and sanitation services and only 3 of the 6 local municipalities have fully functional finance departments namely the Richmond, uMngeni and Mpofana local municipalities (UWP (2004a), Section 4 p.2).

The rural schemes are not incorporated into the financial system and are currently being run by external service providers by way of service contracts. As stated it will be necessary to incorporate those rural schemes in terms of revenue collection, accounting and controls at collection sites, should an internal WSP mechanism be adopted (UWP (2004a), Section 4 p.2).

On analysing the number of days it takes to collect water and sanitation revenue it was found that most municipalities have collection days exceeding 60 and 90 days. The appointment of debt collectors may be necessary for these collections (UWP (2004a), Section 4 p.2).

Some of the local municipalities are in a financial deficit situation and therefore this limits their borrowing capacity and ability to provide water services. The important responsibilities of the WSP are to operate the water services provision efficiently and effectively in a way that will prove to be financially viable.

The status quo report provided information on all the local municipalities within the uMDM in terms of the financial department, the financial systems, financial

performance, revenue collection and debtors. The following is an extract from this financial analysis for each local municipality.

3.3.4.1 Assessment of the uMshwathi Local Municipality

Financial department

At the time of the investigation the local municipality had fully outsourced its financial function but now do have a chief financial officer and an assistant finance manager. There are 4 towns in the municipality that have receipting offices. The majority of the rural water schemes are managed by Umgeni water that collects the revenue at these schemes.

Financial system

The water services provision function is ring fenced in terms of income and expenditure. It is still necessary to include costs associated to water and sanitation services into the ring fenced function, e.g. salaries of the financial manager. No information was available on the rural water schemes that were run by Umgeni water. It was recommended that the financial system should be able to differentiate financial results into different services, and furthermore, each scheme should be monitored separately. The system must be able to incorporate the provision of free basic water and report on the costs of such a provision (UWP (2004a), Section 4 p.6).

Financial performance

The local municipality was showing a surplus in the water and sanitation services. This is expected to change when the rural water schemes are transferred and when the free basic water policy is implemented. There are loans that have been taken out for the provision of the rural schemes that will have to be settled before the schemes are transferred. Additional resources will have to be transferred to the local municipality for the proper management of the financial aspects of the schemes (UWP (2004a), Section 4 p.7).

Revenue collection

The local municipality is responsible for the water meter reading, posting of accounts and collection of monies for water services and at the time of this investigation they did not have enough human resources capacity in the finance department to ensure that

the revenue is collected from the rural water schemes. It is important to consider the implications of the staff transfer from Umgeni water. There is no water loss or lost revenue management being performed and this issue will need to be addressed to reduce the loss in revenue (UWP (2004a), Section 4 p.8).

Tariff structure

Each of the towns in uMshwathi has its own tariff structure and efforts are being made to rationalise these tariffs. At the time of the investigation the local municipality had a fixed flat rate tariff for water, however different tariffs were charged for the different towns in the local municipality.

Debtors

Approximately 44% of the municipalities' debtors were water consumers with the debt collection period sitting at 300 days. The reason for this was largely due to the shortage of staff in the finance department and the distance that people have to travel to get to the local municipality pay offices. Decentralised pay offices or pay points can be established in each town (UWP (2004a), Section 4 p.9).

3.3.4.2 Assessment of the uMngeni Local Municipality

Financial department

The department is fully functional and has the required management and operational staff.

Financial system

The water and sanitation income and expenditure is ring fenced and accounted for separately. Unfortunately the budget for the water and sanitation does not include for indirect costs. A 10% management fee is claimed from the uMDM for the administration and management of the water services provision (UWP (2004a), Section 4 p.9).

Financial performance

Any surplus is retained in the water and sanitation services and not used to subsidise other services. The salaries and benefits paid to staff makes up 12,58% of expenditure. Any deficits are claimed from the uMDM.

Revenue collection

This is performed by the local municipality. The local municipality has decentralised pay points / offices within its area for the payment of accounts. The water meters are read monthly and there is a disconnection policy for non payers (UWP (2004a), Section 4 p.11).

Tariff structure

The local municipality applies a free basic water policy and thereafter a step tariff, which varies for different areas. The local municipality was in the process of rationalising the tariffs uniformly throughout the area.

Debtors

Approximately 16,84% of the local municipality's debtors are the water services consumers with the debt collection period being 1016 days. The water debt represents 27,5% of water income and 67% of the sanitation/sewage and refuse income. The collection of revenue has improved since the outsourcing of the debt collection function (UWP (2004a), Section 4 p.13).

3.3.4.3 Assessment of the Mpofana Local Municipality

Financial department

The department is functional but is not really knowledgeable about water and sanitation issues. The department has huge backlogs due to staff shortages, but these positions are slowly being filled.

Financial system

The accounting system ring fences the different services including water services and was at the time of the investigation installing a new financial management system. The local municipality has not implemented its free basic water policy (UWP (2004a), Section 4 p.13).

Financial performance

The financial statements were not available at the time of the assessment.

Other outsourced services

Goods and services are obtained as and when required.

Revenue collection

This is performed by the local municipality in Rosetta and Mooi River.

Tariff structure

The local municipality had a flat rate at the time of the investigation.

Debtors

Approximately 59% of the local municipality's debtors are the water services consumers with the debt collection period being 1016 days. The debt is largely due to the high unemployment in the municipality (UWP (2004a), Section 4 p.14).

3.3.4.4 Assessment of the Impendle Local Municipality

Financial department

The department is not functional due to a shortage of staff. There is only one cash office although efforts are underway to establish cash offices in other areas within the local municipality.

Financial system

The financial system allows for the ring fencing of income and expenditure to the various services offered but this is not performed by the local municipality. The water schemes that are run by other water utilities are not incorporated into the municipalities accounting system and the free basic water principles have not been implemented (UWP (2004a), Section 4 p.14).

Financial performance

Goods and services are obtained as and when required and Umgeni water are contracted to do the water quality testing of various schemes.

Revenue collection

Only the Impendle village is billed for their water consumption. Some employed cashiers are stationed out at the rural water schemes. Their salaries are paid by the

local municipality but they are not on the pay roll. There is no water loss or revenue loss management performed by the municipality.

Tariff structure

There are minimum water charges billed from some consumers and some consumers being charged a meter rental (UWP (2004a), Section 4 p.15)

Debtors

Approximately 33% of the local municipality's debtors are the water services consumers with the debt collection period being 365 days. The debt is largely due to the high unemployment in the municipality (UWP (2004a), Section 4 p.16)

3.3.4.5 Assessment of the Mkhambathini Local Municipality

Financial department

The department at the time of the investigation had sufficient staff, however should the local municipality be considered as a WSP then additional staff will be required especially if they have to operate and manage the rural schemes.

Financial system

The accounting system has ring fenced the different services offered in the local municipality including water services. Of the overheads incurred by the local municipality, 35% is allocated to water and 10% is allocated to sanitation services. These proportionate allocations would change should the municipality start operating the rural schemes (UWP (2004a), Section 4 p.16).

Financial performance

The municipality bills two towns in the area and the rural schemes are billed by Umgeni water. The budget was showing a deficit for both the urban and rural water and sanitation services.

Outsourced services

There is an agreement with Umgeni water for them to perform the operations and maintenance of all water and sanitation services within the local municipality. Other goods and services are obtained as and when required (UWP (2004a), Section 4 p.17).

Revenue collection

Umgeni water take water readings on the rural schemes and collect the payments but are not responsible for debt management. The local municipality collects payments from the urban and peri-urban areas. There is a pay office in Camperdown and decentralised offices in the rural areas.

Tariff structure

The local municipality has a flat rate tariff for water and sanitation services with a variation in the tariff for different urban and rural areas. The municipality is not implementing the free basic water principle or subsidising any of the services rendered.

Debtors

Approximately 65% of the local municipality's debtors are the water services consumers with the debt collection period being 94 days. The debt is largely due to the high unemployment in the municipality and it will become increasingly more difficult to collect revenue should the rural schemes become the local municipality's responsibility (UWP (2004a), Section 4 p.18).

3.3.4.6 Assessment of the Richmond Local Municipality

Financial department

The department is functioning successfully, headed by an acting chief financial officer who is contracted through a service provider and assisted by a permanently employed assistant finance manager.

Financial system

The water and sanitation income and expenditure is ring fenced and accounted for separately. The municipality has an indigent policy which is offered to all those who qualify.

Financial performance

The costs for the operations and maintenance are funded from revenue's generated through the provision thereof. Any deficits are funded by the uMDM (UWP (2004a), Section 4 p.19)

Revenue collection

This is performed by the local municipality in the two towns in the area. Two of the peri-urban settlements is a concern for the municipality as they do not have the resources to undertake revenue collection in these areas.

Tariff structure

There was a range of tariffs applied in the various urban and peri-urban areas within the local municipality. The local municipality will have to work at unifying the tariff structure.

Debtors

Approximately 17% of the local municipality's debtors are the water services consumers with the debt collection period being 136 days. The local municipality has engaged the services of debt collectors, which has improved the situation.

Disconnections and reconnections are performed on a monthly basis and unpaid debt is handed to debt collectors for collection. The increase in the number of consumers, when including the rural areas raises concerns on the available resources to do the additional work, which will have to be addressed (UWP (2004a), Section 4 p.20).

3.3.4.7 Assessment of the uMgungundlovu District Municipality

At the time of the investigation the uMDM was not performing any WSP function. The erstwhile Transitional Local Councils (TLC's) areas continued with the WSP function after 1 July 2003 on the uMDM's behalf. From a financial point of view most of the local municipality's have ring-fenced the administrative unit with regard to water services. There are a number of schemes that are to be transferred to the uMDM from Umgeni water and have associated to them considerable debt. The debt will have to be settled before the transfer takes place.

Financial department

The department seems to be adequately staffed.

Financial system

The uMDM reimburse the local municipality's the deficit incurred for the operations and maintenance of the water and sanitation services provision in their area. The uMDM do not have a free basic water policy

Financial performance

From the report it reveals that the uMDM runs into deficits every year regarding the operations and maintenance function. The uMDM budget includes for all erstwhile TLC areas water services schemes and rural schemes (UWP (2004a), Section 4 p.21).

The budgeted income and expenditure for the water and sanitation services per local municipality, which was provided by the uMDM technical department, was as provided in Table 3 below:

TABLE 3: BUDGETED INCOME AND EXPENDITURE FOR THE O & M FUNCTION OF WATER SERVICES (2004/5 FINANCIAL YEAR) (UWP (2004a), Section 4 p.22).

Water & Sanitation	Water & Sanitation O & M	Refurbishment	Repairs	Total O & M	Income	Difference
Umshwathi	R 8,111,670	R 2,363,483	R 110,000	R 8,221,670	R 4,048,331	(R-4,173,339)
Umngeni	R 19,276,000	R 1,422,000	R 439,000	R 19,715,000	R 18,166,000	(R-1,549,000)
Mpofana	R 2,288,650	R 2,148,879	R 1,192,700	R 3,481,350	R 5,123,340	R 1,641,990
Impendle	R 1,470,000	R 3,567,324	R 20,000	R 1,490,000	R 0	(R-1,490,000)
Mkhambathini	R 5,748,631	R 3,254,010	R 13,000	R 5,761,631	R 1,550,134	(R-4,211,497)
Richmond	R 3,449,704	R 6,053,190	R 140,000	R 3,589,704	R 2,659,193	(R-930,511)
Total	R 40,344,654	R 18,808,886	R 1,914,700	R 42,259,354	R 31,546,998	(R-10,712,356)

As stated in the professional comment report varying information was received from the local municipalities which was difficult to verify and therefore a financial cost

model was developed to assess the financial situation of the WSA, advocating that it was itself the WSP and assuming it was going to adopt an internal water service provision mechanism.

A number of assumptions were utilised in the theoretical model for which it is felt that some assumptions should be revised. The assumptions were as follows:

Consumption:

1. House connections 200 l/p/d
2. Yard connections: 80 l/p/d
3. Basic level of Service: 25 l/p/d
4. Commercial Demands: 30%
5. Water Losses: 15%
6. Free Basic Service: 6 kl/hh/month
7. Assumed tariff: R 4/kl
8. Cost recovery: 60%

Operation and Maintenance Costs:

1. House connections: R 55/hh/month
2. Yard connections: R 35/hh/month
3. Basic Service Standpipes: R 20/hh/month
4. Below basic service standpipes: R 15/hh/month
5. Waterborne sanitation: R10/hh/month
6. VIP sanitation service: R 5/hh/ month
7. Bulk water tariff: R 2,50/kl

(UWP (2004b), p.26)

For the theoretical analysis the following additional assumptions are made:

1. 2001 Census data was used as a basis for population figures and level of service.
2. Commercial and institutional needs assumed as percentage of the total urban water demands;
3. Bulk water purchase cost based on the current tariff charged by Umgeni Water at R2.5/kl;
4. Proportion of bulk purchase for urban areas based on scheme information from the Status Quo Report document;
5. Water tariff based on the average value of tariffs as indicated in the document;
6. Costs exclude costs of refurbishments and servicing of loans as these will be required irrespective of the future.
7. The assumed level of cost recovery being 30% and 80% for rural and urban areas respectively (UWP (2004b), p.26)

8. *It was further noted and not included in the professional report that in the financial model, the consumption from stand pipes in the urban and the rural areas were accounted for under expenditure but not billed, and that no costs were allocated to “unaccounted for water”, that was provided for by sources other than the bulk water distributor.*

From the theoretical financial model the following results were obtained for each local municipality, for the current situation as detailed in Table 4, and for the assumption that all people are provided with services to at least a Reconstruction Development Programme (RDP) level of service as detailed in Table 5. It must be noted that these figures were as calculated at the end of year 2004, the results for which are provided in tables 4 and 5 that follow below.

In the recommendations of the Section 78 Assessment that was completed in terms of the Systems Act and as previously mentioned, it was resolved that the internal option for a WSPU should not be adopted because of the lack in human and material resources and an improper institutional arrangement.

It was evident that the uMDM and most of the local municipalities did not have the resources or the institutional arrangements to perform the water and sanitation operations and maintenance provision, however the uMDM was considered to be financially capable and since the completion of the assessment they have decided to establish the institutional arrangements and provide the human and material resources so as to adopt the internal mechanism contrary to the recommendations of the consultants of appointing a large regional service provider (UWP (2004b), P.33).

It is still necessary to apply the additional aspect of the inclusion of the cost for lost revenue incurred due to unaccounted for water that is sourced from a source other than Umgeni Water. This will be illustrated in the findings chapter of this report.

TABLE 4: THEORETICAL FINANCIAL SUMMARY FOR EACH MUNICIPALITY (2004/5 FINANCIAL YEAR) USING THE CENSUS 2001 INFORMATION – CURRENT CONSUMERS SERVED. (UWP (2004b), Section 4 p.28)

Local Municipality	uMshwathi	uMngeni	Mooi Mpofana	Impendle	Mkhambathini	Richmond	TOTAL
Cost of bulk water	R 3,606,330.52	R 7,273,023.78	R 0.00	R 0.00	R 2,542,621.25	R 925,733.75	R 14,347,709.31
Water Supply O & M	R 5,217,444.75	R 7,902,337.23	R 2,725,326.31	R 2,138,190.29	R 2,433,052.13	R 2,868,938.19	R 23,285,288.90
Sanitation O & M	R 708,518.63	R 1,600,817.08	R 476,251.20	R 363,171.45	R 411,759.70	R 407,383.97	R 3,967,902.03
Total cost of services	R 9,532,293.91	R 16,776,178.08	R 3,201,577.51	R 2,501,361.74	R 5,387,433.08	R 4,202,055.91	R 41,600,900.24
Total income (No free basic water).	R 3,920,779.78	R 10,730,081.37	R 3,340,715.94	R 776,522.61	R 1,194,987.22	R 2,573,926.27	R 22,537,013.18
Balance (No free basic water)	R-5,611,514.13	R-6,046,096.72	R 139,138.43	R-1,724,839.14	R-4,192,445.86	R-1,628,129.64	R-19,063,887.05
Total income (With free basic water).	R 2,759,577.41	R 8,240,244.45	R 2,539,581.97	R 416,370.49	R 792,754.37	R 1,940,600.32	R 16,689,129.02
Balance (With free basic water)	R-6,772,716.50	R-8,535,933.64	R-661,995.54	R-2,084,991.25	R-4,594,678.71	R-2,261,455.59	R-24,911,771.22
Total volume of sales	689,894.35 Kl	2,060,061.11 Kl	634,895.49 Kl	104,092.62 Kl	198,188.59 Kl	485,150.08 Kl	4,172,282.25 Kl
Water Tariff (R/Kl)	R 13.82	R 8.14	R 5.04	R 24.03	R 27.18	R 8.66	R 9.97

Local Municipality	uMshwathi	uMngeni	Mooi Mpofana	Impendle	Mkhambathini	Richmond	TOTAL
Cost of bulk water	R 4,100,876.05	R 7,320,033.68	R 0.00	R 0.00	R 3,093,255.07	R 1,145,390.50	R 15,659,555.31
Water Supply O & M	R 7,203,725.01	R 8,269,451.02	R 3,182,678.45	R 2,520,729.34	R 3,546,441.90	R 4,408,409.59	R 29,131,435.31
Sanitation O & M	R 708,518.63	R 1,600,817.08	R 476,251.20	R 363,171.45	R 411,759.70	R 407,383.97	R 3,967,902.03
Total cost of services	R 12,013,119.69	R 17,190,301.78	R 3,658,929.65	R 2,883,900.79	R 7,051,456.67	R 5,961,184.07	R 48,758,892.65
Total income (No free basic water).	R 3,943,538.26	R 10,745,174.85	R 3,344,666.70	R 776,601.45	R 1,195,241.26	R 2,602,799.23	R 22,608,021.74
Balance (No free basic water)	R-8,069,581.43	R-6,445,126.93	R-314,262.96	R-2,107,299.34	R-5,856,215.41	R-3,358,384.84	R-26,150,870.91
Total income (With free basic water).	R 2,782,335.89	R 8,255,337.93	R 2,543,532.73	R 416,449.33	R 793,008.41	R 1,969,473.28	R 16,760,137.58
Balance (With free basic water)	R-9,230,783.80	R-8,934,963.85	R-1,115,396.92	R-2,467,451.46	R-6,258,448.26	R-3,991,710.78	R-31,998,755.07
Total volume of sales	695,584	2,063,834	635,883	104,112	198,252	492,368	4,190,034
Water Tariff (R/Kl)	R 17.27	R 8.33	R 5.75	R 27.70	R 35.57	R 12.11	R 11.64

To be able to fund the deficit that will result from the provision of water and sanitation services it is required that the uMDM allocate sufficient funds to the service provision by way of the equitable share that is received by the uMDM in terms of the Division of Revenue Act (Republic of SA (2006), p.30).

The uMDM in terms of the Division of Revenue Act has been allocated an equitable share for the next three years. The allocations are as follows:

TABLE 6: THE EQUITABLE SHARE ALLOCATIONS TO THE UMDM

(Republic of SA (2006), p.30)

DC22 uMgungundlovu District Municipality			
Components	National Financial Year		
	Column A	Column B	
	2006/07 Allocation	Forward Estimates	
		2007/08	2009/10
S – Grant	R 39,166,983	R 44,933,979	R 54,598,483
I – Grant	R 1,242,128	R 1,425,021	R 1,731,517
Levy replacement Grant	R 93,711,889	R 109,166,000	R 119,366,000
Total Allocation	R 134,121,000	R 155,525,000	R 175,696,000

The above allocation comprises of various grants and can be interpreted as a portion for the Services grant, free basic services, institutional grant and the levy replacement grant.

A summary of the findings of the section 78 assessment was provided in the professional comment report as follows:

TABLE 7, SUMMARY OF THE INTERNAL ASSESSMENT OF THE WSP

(UWP (2004b), Section 4 p.32).

MUNICIPALITY	FUNCTION		
	Technical	Financial	Institutional
Umshwathi	V	X	X
uMngeni	V	V	V
Mooi Mporofana	X	X	X
Impendle	X	X	X
Mkhambathini	X	X	X
Richmond	V	V	V
uMDM	X	V	X

Likely Ability of the WSP's to fulfill the role of WSP (v = likely; x= unlikely)

For the uMDM to establish a large internal mechanism it is implied that the framework for the WSPU would be a somewhat centralised operating structure with centralised systems. This decision of the uMDM will follow the vision of the organisation of becoming a dynamic metropolitan area.

3.5 REVIEW OF THE INVESTIGATIONS INTO THE ENTERPRISE RESOURCE PLANNING (ERP) / FINANCE SYSTEM

With regard to the finance system, it must be compliant with the Public finance management act, Act No. 1 of 1999 as amended by Act 29 of 1999, the Municipal Finance Management Act, 2003 (Act No. 56 of 2003), the Supply Chain Regulations and the Generally Accepted Municipal Accounting Practice (GAMAP) requirements. Controls will have to be programmed into the software to ensure compliance with the acts and regulations.

In terms of the comments made on the legislative requirements as provided in the legislation section of this report, the uMDM have opted to utilise the services of SITA and have engaged on investigations into the provision of an Enterprise Resources Planning (ERP) / Finance package for the uMDM (Republic of South Africa (2005b), p.29)

In the 1st phase of the investigations SITA and their appointed consultants investigated the status quo of the uMDM in terms of the information technology and financial system in operation. In the 2nd phase SITA's appointed consultants investigated the status quo of the information technology and financial systems of the six local municipalities within the uMDM, for which it is proposed that the function of the operation of the water and sanitation provision be transferred to the uMDM, and therefore the requirement for the revenue collection to be administered by the uMDM. The 3rd phase of the project is to procure an ERP or financial system for the uMDM to incorporate all the local municipalities. The two environments that are appropriate for the effective running of the WSPU that is under discussion is the on-line computer system and the data warehousing as referred to in the theoretical literature review and which must be taken into consideration in the 3rd phase. It is proposed that all the decentralised offices will be linked by a virtual private network and will share data and transfer data to a data warehouse. More information on the virtual private network is as provided in the section on the "Information Technology Network Requirements" section of this report, item 3.7.3.

In the 2nd phase of the investigation performed by SITA's appointed consultants, the object was to assess the current business procedures followed in the billing for water and sanitation services. The process assessed were the registration, invoicing, receipting, day-end procedures, outstanding debtors, disconnections and account queries procedures (Deloitte, p.4)

The registration processes followed by the local municipalities were all similar although the uMshwathi and Richmond municipalities differed slightly from the other municipalities in that they provided the consumer with a quotation after an assessment, and did not have a fixed charge. Some of the municipalities performed the installations themselves however Mkhambathini outsourced these connections to the uMngeni Water, water utility, to perform.

The invoicing of accounts is performed by the municipalities themselves excluding Mkhambathini, Richmond and the uMngeni municipality. The municipality's bill from what is recorded by the meter readers however should there be a large deviation from previous accounts, the uMshwathi and Mpofana municipality bill an average of

the previous three months and send officials to verify the meter readings. The process followed for receipting is the same in all municipalities.

The end of day reconciliations are performed manually by all the municipalities except for Mpofana where this is done utilising an IT accounting system. Mpofana is the only municipality that banks its own takings, while all the other municipalities utilise coin security companies.

The Mpofana, uMngeni, Impendle and Mkhambathini allow a 60 day payment period before restrictions in the provision of the service is enforced. The Richmond and uMshwathi municipality apply restrictions after 30 day of non payment. All the municipalities utilise there system to perform an age analysis excluding the Mpofana municipality who do this manually. The process for disconnections and account queries is the same for all municipalities (Deloitte, p.5)

It was necessary to ascertain and assess what each municipality was performing and what information technology system / financial package was in operation. The intention of this investigation was to use the assessment to best propose a uniform system that is to be adopted by the uMDM for the revenue collection from all the municipalities in terms of water and sanitation services as it is proposed that there is going to be a merger of all the municipalities into one system and it is necessary for the system adopted to be able to manage the entire uMDM's area of jurisdiction.

There are some existing finance systems in the local municipalities that are outdated and will not be able to interface with any of the existing finance systems and therefore will have to be replaced. There may be one existing finance system within one of the six municipalities that meets the requirements of the new WSPU, which could remain and be adopted by the WSPU as the preferred Finance system thus enforcing the change in the finance systems in the remaining five local municipalities. It may however be required that all the existing finance systems be replaced by one system.

There are a number of requirements that must exist within or be able to be effected by the adopted financial software packages. These factors are largely as highlighted in the literature review and serve to provide controls in the system. The requirements

should not be seen as all inclusive but must be prevalent in the system adopted as follows:

1. The registration of customers must be linked to identity numbers and Home Affairs (for deceased persons);
2. Application must be able to be performed on-line.
3. Any deposits need to record receipt numbers before an account number is entered.
4. The system must be able to accommodate decentralised receipts and be linked to decentralised payment offices.
5. The system must be enabled to print out variation reports for water meter readings.
6. An audit trail, tracing who has prepared documents must be able to be printed.
7. The system must identify duplicate receipt numbers and the inconsistency in sequences of numbers.
8. Queries of accounts must be able to be prepared from decentralised offices.
9. There must be a unique reference number given for every pay point.
10. The disconnection of water needs to be verified by personnel before authorised.
11. Reports or comments from customers need to be captured electronically so that on enquiry one will be able to see what was previously discussed.
12. The cash book must be updated every day and interfaced into the general ledger.
13. An age analysis must be able to be performed and any given time and a backup must be available for any given year.
14. An account must be accessed given any information such as the customers ID, address or account number.
15. Access to information and the change of information must be password protected.
16. The system must be able to produce lists of consumers for hand over to attorneys, for collection purposes.
17. There must be provision for the payment of accounts by customers from multiple payment facilities.
18. The service provider who provides the software package must provide good maintenance on the system, regular updates and must be located close to Pietermaritzburg.

19. The system must indicate when expenditure is getting close to a maximum budget.
20. It must accommodate a database of tender awards.
21. The system must ensure compliance with legislature.
22. It must keep a register of orders, and reconcile orders.
23. The system must be able to create a retention reserve.
24. A database for suppliers must be included providing details of frequency of their award and performance etc.
25. There must be a process tracking system for orders.
26. The system must show the budget and any expenditure reallocations.
27. The system must include for an asset register with asset values.
28. The system must be linked to a performance management system and reward systems (uMDM, (2006a)).

An investigation was performed on what financial systems were utilised by each municipality with the systems used being as follows:

TABLE 8, FINANCIAL SYSTEMS UTILISED BY THE MUNICIPALITIES

(Deloitte, p.6)

MUNICIPALITY	FINANCIAL SYSTEM				
	ABACUS	DOLPHIN	VENUS	SAMRAS	BEKKER
Mpofana			X		
uMshwathi		X			
Richmond	X				
Mkhambathini	X				
uMngeni				X	
Impendle	X				
UMDM					X

To be able to compare the various systems utilised by each municipality a schedule was obtained from an unknown source, which identifies the various applications of the systems as identified above excluding the Dolphin and the Bekker systems. The

modules that will be required by the uMDM are those modules as have been shaded. This indicates that the Venus software package has the necessary capabilities that are required by the uMDM. It is however necessary that additional systems be assessed that are not listed in the table below and that a “TELOS” assessment as previously mentioned be performed to determine which one of the systems is the most feasible in terms of its technical, economic, legal, operational, and scheduled feasibility.

On completion of the TELOS assessment, a specification will have to be produced indicating the requirements of the system to be procured following the supply chain regulations and the system procured.

This exercise will not be performed in this dissertation and can be included as further research required in terms of this dissertation.

TABLE 9, COMPARISON OF FINANCIAL SYSTEMS (SITA (2006))

MODULES	FINANCE SYSTEM				
	Abakus-ICL	Promis-ICL	E-Venus Business	Samras – NDS	Nyl-Data
Consolidated Billing	X	X	X	X	X
General Ledger	X	X	X	X	X
Stock & Creditors	X	X	X	X	X
Assets Register.	X	X	X	X	X
Salaries	X		X	X	
Fleet Management		X	X	X	
Job Costing		X	X	X	X
RSC Levy Module			X		
Abakus-ICL			X	X	X
Geographical Info System		X	X		
Voters Roll	X		X		X
Health and Clinic System			X		
Library System			X		
Office Automation			X		
Fuel Control		X	X		
Access Control System			X		
Traffic System			X		
Management Info Systems		X	X		
Doc Imaging / Archiving		X	X		
Receipting	X	X	X	X	X
Valuation & Town Planning			X		
Risk & Insurance Management			X		
Web Based Financial system for the above modules			X		
One Entry Level to all systems			X		
Call Centers			X		
Cemetery Management system			X		
Cash Spiller			X		
Credit Control & Clearances			X		
Customer Relations Management			X		
Infrastructure (Hardware & Networks)			X		
Hosting of Services (Internet/e-mail/Web and other services)			X		
Services Centers			X		
IT Outsourcing			X		

3.6 POLICY FORMULATION

There are a number of policies that are to be finalised prior to the finalisation of the implementation stage of the reengineering process. These policies include:

- A free basic water and sanitation policy;
- An indigent policy;
- A tariff policy; and a
- Credit control and debt collection policy.

Reference is made in this extract to the policy cycle namely the agenda-setting, policy formulation, decision making, policy implementation and the policy evaluation stages. All references to the policy cycle must be read in association with the explanation provided in the theoretical literature review provided in this report.

In the case of the policies as identified above, it is a statutory requirement and therefore the government is the actor responsible for the promotion and priority thereof, which is referred to as the agenda setting stage of the policy cycle.

The uMDM are still in the policy formulation process, which is the second stage in terms of the Policy Cycle. In this process the actors will have to be defined and may or may not consist of the same actors that were involved in the agenda setting stage. As mentioned previously thought will have to be made as to who will be carrying out the policy and which actors, who are participating in the formulation process, will follow through with participation in the implementation stage so as to achieve continuity. Regarding the policy, the actors in the formulation stage could be the Department of Water affairs, the Water Services Authorities, Local Municipalities, Water boards and other water utilities, industry representatives, non-government organisations, community, tribal authority and labour representation, and outside specialists that are required where the expertise have to be obtained (Hessing, p.136).

In this process one looks for the solutions to solve the issue or problem. In this case the factor that affects all the policies mentioned has been identified as poverty or the unaffordability to pay for water services (DWAf (2001), Para 3). Another problem and possibly the actual problem that has to be resolved is the lack of economic

development. Because of poverty people can not afford to pay for water services. As mentioned previously citizens of the country have a right to basic services and the only way in which government is able to meet this obligation in the immediate term is to provide water services free of charge. Hopefully by providing water, this will stimulate economic development and create employment. Those with income may be able to afford to pay for the receipt of services and therefore some income from water sales may be received from customers who apply for a higher level of service than the basic level. It will be important to question how one is going to implement the policy in these initial stages as forethought in policy development.

In the process as above of finding solutions and alternative solutions one may develop a better understanding of the problem and define the real problem (Hessing, p.136). In the above case it is believed that the problem is the lack of economic development resulting in poverty but with solving the initial problem, new problems are created, which will lead to a stage in the process that is referred to as the evaluation stage.

In the decision making stage the actors should base their decisions utilising a rational approach rather than the incremental approach (Hessing, p.158). The rational approach used would be a cost benefit analysis where in the case of the free basic water and sanitation policy, the indigent policy and the tariff policy, one would have to decide how much water the water utility is able to give free of charge based on the affordability of the water utility and in terms of the credit control and debt collection policy, what would be the cost of collecting debt and how much one would be able to collect.

Mention has been made of six kilolitres free basic water and a three kilolitres free indigent allocation but the water authority may not be able to provide such a free consumption due to financial constraints. This will become evident once a cost benefit analysis is performed (Hessing, p.158).

Notwithstanding which of the above models are adopted, the decision making is inherently a political process with the final decision resting with the politicians who may or may not utilise the results obtained from using the above models (Hessing, p.157).

Once the decision is made it is necessary to implement the policy and it is an easy transition for those actors who have been involved in the previous stages to understand the principles of the policy and what has to be performed.

To be able to implement the policies they need to be seen as rules or regulations that are to be enforced within the jurisdiction of the water services authority (Hessing, p.175). To be able to enforce these policies by way of regulation, sufficient human resources would be required to ensure compliance and a means of penalising for non-compliance will have to be provided for. The penalty for non compliance to the tariff policy and hence non-payment, could be the installation of a flow restriction device which would therefore ensure restricted flow at the consumer's connection, an inconvenience and incentive to comply with the payment for a higher level of service.

In the free basic water policy context the policy will have to be very much incentive based due to the lack of human resources. Promotion of free basic water in a way that encourages less consumption e.g. using a slogan that says "use less water = get it free" would hopefully encourage less free consumption and reduce the costs of implementing such a policy.

Monitoring will have to be performed on the effectiveness of the implementation of the policies. From the monitoring process one will be able to evaluate the success of the policy and its implementation. One would also be able to evaluate the factors utilised in the monitoring exercise to verify if they are the correct factors to monitor or not, and possibly remove some and add others for improvement in the monitoring thereof (Hessing, p.195).

3.7 REVIEW OF THE UMGUNGUNDLOVU PEER REVIEW REPORT

On the 16th and 17th of February 2006 the uMDM WSA hosted a “Peer review session”, which was facilitated by the Palmer Group on behalf of the District Water Services Managers’ Forum (DWSMF). There were at the time 21 district municipalities throughout the country, who had similar geographical and demographic environments who formed this forum for the intension of sharing information and learning from one another regarding the various aspects of the function of the water services authority.

The Executive manager: WSA of the uMDM had previously invited the forum to visit the uMDM and review how it was functioning and as invited, the forum agreed to conduct the first peer review session on the uMDM / WSA.

The review process was performed over a 3-day period where presentations were given by representatives of the uMDM to the representatives of the forum including other stakeholders namely the Water research commission (WRC), the Department of water affairs (DWA), the Department of local government and Mvula trust, on the following areas namely the Institutional perspective; the financial perspective; strategic asset management; and service standards. The representatives of the forum and stakeholders were given free reign to question the team of presenters on the subjects presented, criticising constructively and giving advice where relevant. On completion of all the presentations the forum, excluding the uMDM officials, conducted assessment sessions where they deliberated on the general observations of the uMDM and assessed the municipality on its strengths and challenges based on the presentations that had been given.

A report on the peer review session was produced by the Palmer Group from which the relevant comments were extracted and provided for information in Appendix I of this report.

3.8 REVIEW OF THE INVESTIGATIONS ON THE INFORMATION TECHNOLOGIES SYSTEM

3.8.1 Telemetry system

From the benchmarking exercise with other municipalities and making use of information received from major customers and suppliers it was proposed in the investigative report requested from an external consultant namely Business Connection that an integration of three types of systems be utilised for the telemetry system namely a Radio Frequency (RF) system, a Global System for Mobile Communications (GSM) system, and a General Packet Radio Service (GPRS) system. All these three systems are required for various applications and circumstances (Business Connection (2006), p.22).

As referred to in the theory it is necessary to determine the items, referred to as entities and the relationships between the technical and the social elements.

The entities from where information will need to be sourced are as follows;

1. Water levels in the reservoirs.
2. The flows from bulk water meters.
3. Information on the ground water levels in borehole water sources.
4. Information on the status of pumps, whether on or off, on water and sewerage infrastructure.
5. Information as to whether the electrical power is on or off.
6. Information on when a battery is to be replaced.
7. Alarms indicating when intruders have entered a premises.
8. The effluent levels in the sumps of sewerage pump stations.
9. The pressures in the pipelines at the pump stations.
10. This is not a conclusive list and could be added to.

(Business Connection (2006), p12).

The way in which the technical and social elements will interact is through the software program that will be procured to receive information from the telemetry system. This

software better known as a Supervisory Control and Data Acquisition (SCADA) system interprets the received information from the various sources and applications as listed above and displays the information in a more meaningful format that can easily be interpreted by the operators being the social element. The social element likewise has the means to interface with the equipment out in the field through commands that are built into the software SCADA system (Business Connection (2006), p.8).

There are various suppliers of the Supervisory Control and Data Acquisition (SCADA) systems, most of them running on a windows platform and have no special hardware requirements in terms of power or memory. Various suppliers exist with the following packages being investigated in terms of there utilisation within the context of the uMDM namely the Adroit, Intellution iFix, Wonder Ware, and the ProControl system (Business Connection (2006), p.8).

SCADA is the program that interprets the telemetry data that is relayed from the field sensors through the communications technology mentioned above. Both the RF and the GSM signals feed into the SCADA system, with the telemetry option followed having no impact on the functioning of the system. SCADA can send/receive email messages to/from other software applications if required.

As a model on which to base the SWOT analyses when analysing the Local Municipalities in terms of telemetry system the uMDM proposes a the use of all three telemetry systems namely the RF, GSM and the GPRS systems, and the utilisation of the Adroit SCADA system.

3.8.2 Operations reporting system

As stated elsewhere in this report the benchmarking of ones own system with another organisation is a big advantage and when one is constrained by the allowable time to procure a system it is often quicker to purchase an off the shelf product that will meet the majority of ones requirements and then modify or customise portions of the product that one has acquired.

In the case of the uMDM and after investigations into what systems are utilised by other Metropolitan and District Municipalities, the Ethekewini Metropolitan Water

offered to give their operations reporting system, known as “Faultman” to the uMDM free of charge. In a way this can be seen as acquiring an off the shelf product but without having to pay for it (Business Connection (2006), p9).

There was a need to perform what is referred to as a “TELOS” feasibility study on the “Faultman” system. The acronym “TELOS” refers to five feasibility factors that should be used when assessing any software that an organisation is going to procure, to ensure that it will suit the IT environment (Whitten (1994), p815).

When this system was analysed the IT division of the organisation the following were the findings as provided in the report to the Management Committee of the uMDM (uMDM, (2006), p.1 – p.7).

With regard to the technical aspects the “Faultman” system can be accommodated on the current network and desktop infrastructure of the uMgungundlovu District Municipality however a SQL 2000 license will have to be purchased. A server will be required to run the application independently. The required system will be a critical system demanding a minimum of a one hour down time and therefore the disaster recovery strategy will have to be upgraded (uMDM, (2006), p.5).

The proposed system uses a SQL server as the database platform which makes it easily Integratable into other management systems that are proposed for the uMDM such as the District information management system (DIMS) application (uMDM, (2006), p.5).

Regarding the economic feasibility, the Ethekwini Metro Water is prepared to give us the system free of charge with training and the utilisation of their IT Staff at a nominal cost. There is some hardware and software that will require the purchase thereof namely a SQL Server license, IBM X series 345 server or later and an IBM ultumium 3582 23 400 gigabyte tape system, and the crystal reports software (uMDM, (2006), p.5).

Regarding the legal feasibility, there is no expensive legal contract or service level agreements that will be required in terms of the uMDM receiving the system from

eThekwini Metro Water save a gentleman's agreement that uMDM must not sell the system or give it to an outside service provider (uMDM, (2006), p.6).

When considering the operational feasibility, cognisance is taken that Ethekewini Water has been using the system for over ten years and it is very stable. The system can be recovered in 1 hour and that all system reports are generated using the latest technology which is the crystal reports 8 software. Ethekewini Water currently logs calls for Water, Roads, Traffic and storm water. The system handles 70 000 calls per month and the database has only grown to 6 gigabytes over the last 10 years (uMDM, (2006), p.6).

The system has a built in pager system which pages artisans or other relevant personnel. The system can also be linked to the SMS messaging, and the time and Attendance system that is proposed by the uMDM.

The "Faultman" system has a clipboard function which shows the progress of faults reported, this can be displayed in the call centre on the big screen that has already been procured by the uMDM for its operations department. It is further acknowledged that Ethekewini Water constantly conducts training for their system and has offered this service to the uMDM for the training of the agents that will be utilising the system. The system is flexible and can accommodate other services provided by the uMDM from the proposed call centre for example the fire and disaster related calls. It is capable of handling 90% of engineering services faults (uMDM, (2006), p.6).

The schedule feasibility scores high as all that is required is that the management of the organisation approval the installation of the system and the procurement of various software and hardware.

A SQL license and the required Hardware will have to be procured; the street database of the system will have to be populated using GIS information. The system will further have to be installed and be tested in the uMDM's environment and finally the users will be trained. It is estimated that it will take one and a half months to have the system operational which is within the allowable time available in terms of the establishment rollout programme (uMDM, (2006), p.7).

3.8.3 The Information Technology Network Requirements

Investigations have been performed by the information technology department of the uMDM and were requested to provide information on the proposed computer network that is to be installed for utilisation by the WSPU. One of the legislative requirements for local government is that all government and parastatals must be e-governance compliant by the year 2010. The uMDM needs to address this issue, which will enable interaction between central, provincial and local government. The uMDM will have to transform its IT environment so that the delivery of public services will be online and be accessed anytime, from anywhere and by any means, in an interactive mode. There must further be IT applications that will interact directly with businesses e.g. the procurement of goods and services will be provided following steps from electronic tender to electronic payments (uMDM (2005a), p.3).

It is required that the uMDM will transform from a local area network functionality into a wide area network functionality. The current uMDM network consists of a local area network which has good security protocols including fire wall protection, 3 level virus protection, filtered SMTP (email) and http (internet) traffic, Full active distribution and Novell distribution server replication, DMZ for the web server, a backup strategy, surge protection and a 128k Diginet line. In summary the uMDM has very effective security controls and a reliable system (uMDM (2005a), p.4).

In comparison to the uMDM, the six local municipalities excluding the uMshwathi local municipality have insecure IT environments, which are insufficiently established. Most of these local municipalities have no fire wall protection and only one level virus protection, no filtered SMTP (email) and http (internet) traffic, no replication, no proper backup strategy, no surge protection and a 56k dialup line. Their networks are poorly managed with little or no maintenance on their hardware (uMDM (2005a), p.5).

For the local municipalities to become compliant there is much work and expenditure required should they opt to investigate and establish their systems on their own. The uMDM as the umbrella statutory body is in a position to assist the local municipalities in a way that will be mutually beneficial. As the uMDM is establishing a WSPU it will be required to link decentralised offices to the uMDM for the transfer of financial

information, the functioning of the operational reporting system and the telemetry system.

There are a number of other applications that will utilise this computer network including the previously mentioned applications namely:

District Processes	Local Municipality Processes
Water Billing	Internet Access
Access control via Biometrics	Emails service
Time and attendance monitoring	Linking to the District operational system
Telemetry (Scada System)	
Operational Reporting System	

It is further proposed that all financial functions performed at the local municipalities must be interactive on a real-time basis and that the decentralised offices in the rural areas must be interactive on an ad-hoc basis and must be accessed at any time from the central offices based at the head office in Pietermaritzburg. The WSPU reporting system as well as the telemetry system will also be accessed by the personnel in the decentralised offices.

This calls for electronic links between the offices with sufficient band width to cater for the traffic that will be utilising this connection. As the information that will be communicated between the offices is highly confidential of nature there must be high security on the transfer of data. The use of the internet even with the security fire walls etc. are still accessed by hackers, viruses and spy-ware and therefore it was not advised that the internet, be utilised but that a private network be established for the transfer of this sensitive information.

There were four ways considered in which these offices may be linked namely via the standard telecommunication lines, using cellular technology, a specifically dedicated telecommunications line, or a virtual private network (VPN).

As it is decidedly important that electronic links be operated with minimum down time with sufficient band width it would therefore not be desirable to utilise a standard telecommunications contract. The cost of utilising a separate connection which was performed by the uMshwathi local Municipality also proved to be more expensive than the two options to be investigated further, with a link directly to the uMDM. The option of cellular technology is also a costly option and some of the areas where this service is required, does not have cellular communication and the service may prove to be unreliable. A cost analysis was performed on the two options namely the utilisation of dedicated telecommunication lines and the use of a Virtual private network (VPN) (uMDM (2005b)).

When assessing the costs of the wide area network, linking each local municipality to the uMDM via a direct line to the uMDM the direct costs amounted to a total of R70,000 with the operational costs amounting to approximately R22,000 per month. These costs did not include for the additional management, monitoring and configuration of the system, with the management and monitoring being a full time function. The utilisation of a VPN resulted in a total monthly cost of R18,000, with no direct costs applicable (uMDM (2005b)). Included in these costs was the management and monitoring of the system, and dependent on the service level agreement entered into, the guarantee of more than a 98% up time that would be offered by Telkom (Pty) Ltd (Telkom (2006), p.15).

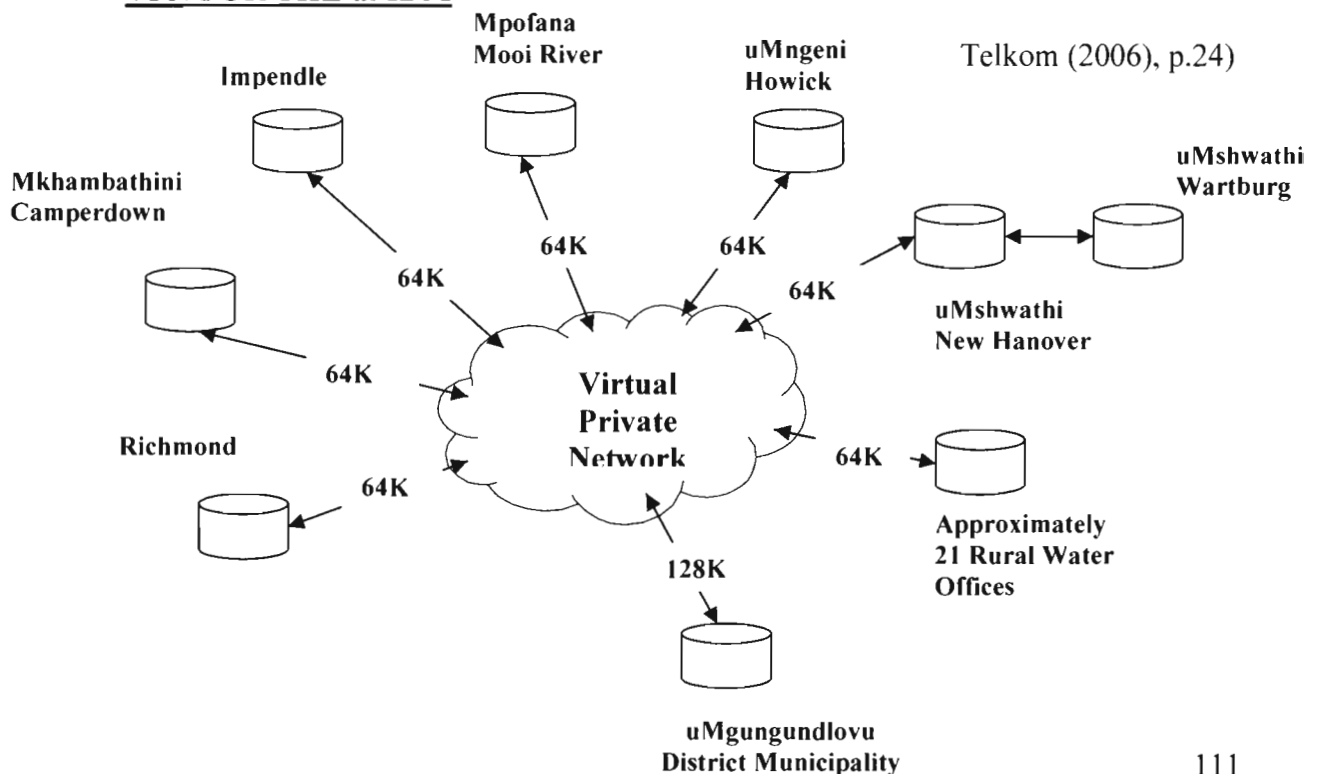
In the investigations it was established that two options were available for linking the uMgungundlovu District Municipality to the decentralised business units. The options were to have either direct links or to establish a Virtual Private Network (VPN). The second option being the VPN, in the opinion of the researcher, was the preferred option due to the following criteria:

- Reduces Capital Expenditure (Economies of Scale);
- Private direct link Networks are Expensive;
- Provides an Organisation with a “Private Network” at a lower cost;
- Faster Return on Investment;
- Complete proactive network management;

- Fault and maintenance management on all aspects of the network;
 - Guaranteed service level agreements on all aspects of the network, including Diginet access lines, Cisco routers, VPN performance and throughput;
 - The provision of dedicated personnel to handle the rollout, installation, deployment, and all service and administrative aspects;
 - Monthly visits by service manager to present and discuss network statistics and reports
 - Access to Cisco certified engineers and specialists
 - Network security derived from a VPN on a private carrier-class national IP network
 - Management, maintenance, and configuration of all Cisco routers, both hardware and software
 - Secure 3G connectivity and ADSL connection from remote sites.
- (uMDM (2005c), p3; Telkom (2006), p.7 – p.10)

The VPN is a private network on top of a public network. It uses the public telecommunication infrastructure that links to remote offices and provides secure access to a network. A typical diagram indicating how the proposed VPN is configured is shown below.

FIGURE 4: DIAGRAMMATIC REPRESENTATION OF THE PROPOSED VPN FOR THE uMDM



CHAPTER FOUR

4 RESEARCH DESIGN

4.1 PROBLEM STATEMENT

As it has been resolved that the uMDM establish an internal water service provision unit, it is necessary that a process be embarked upon to reengineer the existing fragmented institutional arrangement into an integrated and functional water operations and maintenance service provision business unit.

To enable the best possible functioning of the organisational structure it is also required that information technology systems and other controls be developed for this business unit.

As the establishment of the new provision unit straddles a number of local municipalities it is important to investigate the current situation, and get the buy-in from the local municipalities on the structure and systems that have been proposed as a model framework.

4.2 RESEARCH OBJECTIVES

1. Investigate the theoretical and contextual principles on which to develop a framework in terms of organisational structure and operational systems, on which to analyse existing organisational structures and systems for the reengineering thereof.
2. Develop a model organisational structure and types of information and technical systems to be adopted for the Water Services Provision Unit.
3. Ascertain that the model framework developed in 2 above for the organisational structure is appropriate when tested against the opinions and current practices of the local municipalities from where these service provision practices will originate for the merging thereof into one unified operational unit.
4. That the requirements of objective 3 above also be ascertained for the information technology systems framework.

5. That an estimate of the costs for the establishment of the proposed WSPU be produced, estimating the water tariffs that will be required to be charged to fund such an operation.
6. To determine the critical factors to be taken into consideration when establishing similar water services provision units.

4.3 PROCEDURES ADOPTED

1. A theoretical baseline framework was developed in terms of organisational structure and operational systems for the functioning of the WSPU, based on the review of the literature and comments received from the interviewees.
2. A programme was originally formulated by the researcher with assistance from the uMDM reengineering team for the rollout of such a reengineering process and an amended programme was further developed utilising this original programme and taking cognizance of the delays experienced in its practical rollout.
3. The technical managers of the local municipalities were interviewed to determine their experiences with the operations of the water and sanitation services in their municipalities. All the technical managers were requested to answer the questionnaire that was developed for this purpose, which was based on pertinent information requirements developed during the literature review, soliciting information on their current situation and feedback on the proposed model framework developed in chapter four of this report.
4. The members of the uMDM reengineering team were interviewed and their comments received on the process followed with reference to the revised reengineering process rollout programme as referred to above, the difficulties experienced and the solutions adopted in rectifying the problems that arose.
5. The responses to the questionnaires were analysed and a “SWOT” analysis was performed on the uMDM and each Local Municipality namely the uMshwathi,

uMngeni, Mpofana, Impendle, Mkhambathini, and Richmond Local Municipalities utilising the theoretical baseline framework developed in chapter four above as the model framework.

6. The results of the “SWOT” analysis and comments received from the uMDM reengineering team were documented in chapter six of this report namely the findings chapter; and
7. The conclusions providing the results on the feedback, on whether the proposed organisational structure and operational systems developed for the uMDM were satisfactory to those interviewed, and whether the final reengineering rollout programme was sufficient for utilisation by other District municipalities that have a similar environment in terms of demographics and infrastructure and have a similar vision of attaining a metropolitan status.

4.4 DATA SAMPLE

Information was sourced from the technical managers of the local municipalities within the uMDM area by way of a structured questionnaire, which is attached as Appendix E to this report. All the technical managers of the local municipalities were contacted and provided the information requested in the questionnaire except for the uMngeni Local Municipality where the technical manager was not available, however a previous manager for water and sanitation, who recently left the municipality was interviewed. A 100% participation was therefore achieved for the six Local Municipalities, with a representative being interviewed from each municipality, when considering the above comments and a substitute for the current manager of the uMngeni Local Municipality.

Two senior managers of the Technical Services Department of the uMDM were also interviewed, which was regarded sufficient for the uMDM as there are only two managers at Strategic Executive Management and Executive Management level within the Technical Services Department.

The Executive Manager for the operation and maintenance of water and sanitation infrastructure for the Amathole District Municipality was also interviewed as a representative of another District Municipality.

Information was requested by way of interviews with the members of the uMDM reengineering team, with 4 of the 6 (67%) team members being interviewed. The researcher was the 7th member but has not been included in this sample number. Not all the members were interviewed as the researcher was unable to locate them timeously.

4.5 RATIONALE FOR QUESTIONNAIRE

A questionnaire was formulated to acquire further information on the operations and maintenance systems that are utilised by each local municipality within the uMDM and that was not provided in the contextual literature previously referred to. It was further necessary to confirm the information that was already in possession of the researcher. This questionnaire is as attached in Appendix E of this report.

It was further necessary to achieve the buy-in from the technical managers of each local municipality. They were requested to give their professional comments of the structure and systems that are proposed to be utilised for the water and sanitation services in their areas were requested.

The questionnaire included questions on the following aspects:

- The local municipalities current organisational structure and institutional arrangements;
- Confirmation on the number of staff employed and whom will be transferred to the uMDM for the placement into the new organisational structure;
- Comments on the proposed new structure and systems to be utilised by the uMDM;

- The condition of the water and sanitation infrastructure in the municipality that is under their supervision;
- The availability of plant, equipment and materials;
- Information of the operations functionality;
- Information on the operations reporting systems in the municipality; and
- Information on any information technology reporting systems e.g. telemetry, that is utilised in the municipality.

The questionnaire was structured in such a way as to indicate whether each aspect questioned was a strength, weakness, opportunity or a threat to the proposed framework developed for the new establishment, which was utilised to improve the proposed framework.

The questionnaire was further required to ascertain whether the current situation of the operational departmental staffing structure, institutional arrangements and operational systems were suitable for the provision of water and sanitation services. If these aspects or some of these aspects were suitable then there would not have been any need for change.

The provision of information on the number of staff employed and whom are assigned for transfer to the uMDM was required to be able to accurately estimate the immediate cost to the uMDM and to indicate how many additional staff are to be employed. The information on the availability of plant, equipment and materials assisted in determining what resources are to be procured and what additional costs are to be incurred in establishing the WSPU.

The unstructured questionnaire utilised to question the uMDM reengineering team was required so as to identify some critical factors that would need to be taken into consideration in the future establishment of the WSPU for the uMDM and by anyone who may want to use this dissertation as a guide for establishing a similar operational department.

No questionnaire was developed for the financial aspects as this was left for further investigation by another researcher.

4.6 DATA COLLECTION

The data was collected by way of a structured questionnaire, collecting information from Local and District Municipalities on the aspects as highlighted in the previous section, namely the “Rationale for the questionnaire”.

In the interviews it was explained that each interviewee was to be constructively critical, agree and disagree with the model framework so that the most appropriate operational staffing structure and operational systems would be adopted.

Included as part of the questionnaire was a provision for rating the specific answers to the questions in terms of their strength; weakness, opportunity or threat. The rating system utilised was a score between 1 and 5, with 5 being the upper limit, e.g. the high strength would score a 5 and a high weakness would also score a 5. A low weakness and low strength would for example score a 1.

A summary of all the data collected is as provided in Appendix F of this report.

No specific questionnaire was developed for the interviews of the reengineering team and an unrestrictive approach was resorted to in receiving comments on the process that had been followed in the reengineering programme.

4.7 DATA ANALYSIS

All the data received from the questionnaires was compared to the information extracted from the contextual literature review to ensure its accuracy. The information was further analysed to produce a summarised report giving valuable feedback on the proposed framework for the WSPU in terms of organisational structure, institutional arrangements and technical systems.

Information was received, which assisted in the estimation of the immediate additional costs that will be incurred by the uMDM for the establishment and proper functioning of the WSPU.

The following procedures were followed in the analysis of the data received from the questionnaires as provided in Appendix F of this dissertation:

1. Items 1 to 14 of the questionnaire were separately aggregated for each interviewee and by each “SWOT” aspect, determining the average for each aspect, for each local municipality (LM) representative and for the representatives of the uMDM. These results represented the interviewee’s comments on their current organisational structures.
2. Items 15 to 17, which represented the comments received on the proposed model structure were separately aggregated for each interviewee and by each “SWOT” aspect, determining the average for each aspect.
3. The same procedures as were performed for the above items were also performed for items 18 to 25, which represented the comments received on the current infrastructure condition; items 32 to 35, which represented the comments received on the existing plant, equipment and materials; items 36 to 59, which represented the comments received on the current versus the proposed operational functionality; items 60 to 71, which represented the comments received on the current versus the proposed reporting information systems; and items 72 to 78, which represented the comments received on the currently utilised versus the proposed technical information system.

4. Although the questionnaire was developed utilising a scoring system with a scale from 0 to 5, the aggregated results in terms of the above mentioned interpretation were doubled to provide data in a scale from 0 to 10, which provided a better visual representation of the results as shown in Table 26 and Figure 19.
5. From the above results, all the strengths, weaknesses, opportunities and threats (“SWOT” aspects) were grouped and the results of each category aggregated so as to provide an average interpretation from all the results obtained, for each operational aspect in terms of the “SWOT aspects, and for each municipality.

All this information analysed was required so as to meet the objective of the research methodology as previously outlined.

CHAPTER FIVE

5 ANALYSIS & FINDINGS

This chapter provides for 4 aspects regarding analysis and findings that are required in achieving an acceptable conclusion and recommendation namely;

a) the analysis of the literature review so as to develop some guiding principles in terms of theory and context for the development of a model framework. The model framework was developed from these principles in this section;

b) the analysis of the model framework developed, in relation to the findings of the current organizational structures and numbers of personnel currently employed. An analysis of the financial model provided in the section 78 assessment and the parameters utilized in this model was performed and the capital costs for infrastructure were estimated. The estimated flat rate water consumption tariff was further calculated utilizing revised parameters and the findings of the analysis performed in this section;

c) The results of the questionnaires were analysed in terms of the SWOT analysis and a good assessment of the current situation and the proposed establishment in terms of organisational structure, staff numbers, the magnitude and condition of infrastructure and the utilization of operation information technology systems was achieved;

d) An analysis of the model framework re-engineering programme was performed and the comments as received from interviewees on the WSPU establishment process were assessed in terms of concerns and the “SWOT” aspects. This analysis was performed so as to refine the model framework re-engineering programme and provide some critical aspects that one must take cognisance of when performing a similar reengineering exercise.

5.1 ANALYSIS OF THE LITERATURE REVIEW IN ORDER TO DEVELOP A MODEL FRAMEWORKS

A framework was developed in this chapter using the theoretical and contextual literature review in terms of the preferred organisational structure for the WSPU, the technical operational systems design namely the operations reporting system and the telemetry system. As stated previously no further investigation was done into the finance system,

which allows for further investigation by another researcher however a cost analysis is provided on the predicted operational and maintenance costs and the predicted tariffs that will have to be applied.

These frameworks produced in this chapter are utilised in section 5.2 for comparison with the current organisational structures and the technical operational systems of the local municipality's water and sanitation provision departments, enabling a SWOT analysis to be performed on the current situation. The current structure of the uMDM will also be assessed in terms of the proposed structure.

The outcomes of the SWOT analysis produces information for the gap analysis, for which the requirement for further resources will be highlighted and assigned to posts created in the proposed organisational structure. The procedure will further provide information of the technical systems that are to be provided in these local municipalities.

5.1.1 Organisational structure framework

A summary of the principles as highlighted in the theoretical literature review and the comments made in the contextual literature review regarding the organisational structure, which will be utilised to develop a new organisational / departmental structure and referred to in the explanation review are in point form as follows:

5.1.1.1 Principles sourced from the theoretical literature review

1. The restructuring of the current staff structures must be to enable improved customer service.
2. It is recommended that re-engineering shows a change from a functional departmental to a process team structure where there is a drive to educate employees, encourage multi-skilling and working on a performance based reward system (Anstey, p.318).
3. Authority is required to be delegated to where the work is done (Anstey, p.318).
4. By reducing hierarchy and placing control over organisations or units that are closer to where the customer is located, public service is enhanced. This is done by logical geographical decentralisation (Peters, p.36).

5. Decentralisation assists with quicker decision making as it avoids the need to process information through vertical hierarchies (Robbins, p.106)
6. There should be a shift from the protection of functions to creativity and productivity and creation of more flexible supervision (coaching rather than controlling) on a flattened structure (Anstey, p.318).
7. In creating posts in the structure one must analyse the control requirements for the job and the volume of work that the individual in the post will have to process (Manganelli, p.168).
8. It is better to underestimate the staffing complement than overestimate it as it is difficult to resolve the underutilisation problem (Manganelli, p.171).
9. We require an organisational structure that is better suited to react to and deal with unpredictable events, especially in the operational environment not suited to hierarchical model structures (Manganelli, p.133).
10. The most important aspect is that the structure must be optimal for achieving the objectives and should be functional to purpose (Anstey, p.321).
11. Both the machine bureaucracy and the divisional structures are to be considered for the purpose of the WSPU staffing structure (Pennings, p.380).
12. As the divisional structure tends to duplicate activities and resources, which will be a burden to the already evident financial constraints, there will have to be a compelling reason to opt for this structure (Robins, p.118).
13. By focusing managements attention on core functions that require more attention due to its importance to the customer, the organisation with a machine bureaucracy structure is encourage to move more towards a divisional configuration form (Robins, p.314).
14. Item 11 above may be encouraged by structuring performance management assessments on customer criteria (Robbins, p.315).
15. It is also important to develop competitiveness, which can be created through the utilisation of teamwork. As a team they will exploit their strengths and conquer their weaknesses (Hunter, C, p.19; Spur, k, et al., p.7).
16. The span of control must not be too wide as managers will be overworked and subordinates will not be correctly led and controlled. The span must further not be too

narrow as this will result in inefficient and underutilisation of managers (Smit & Cronjé, p.231).

17. The organisational structure has to be adapted to its environment. We propose a stable environment (no great need for coordination and cooperation between departments) (Smit & Cronjé, p.234).
18. Changes in the strategy of a business give rise to changes in its organisational structure.
19. The type of structure that will lead to the successful implementation of tasks will depend on the current culture of the organisation (Smit & Cronjé, p.236).
20. The application of routine technology will apply to a decentralised environment where formalisation is high. The cost of developing a formalised system is justified in the operating environment (Robbins, p.229).
21. Information technology facilitates both centralisation and decentralisation and influences structure by reducing the vertical integration, by the removal of middle management (Robbins, p.230).
22. Technology, information and human potential have enabled the flattening of the organisational structure creating a more responsive organisation (Manganelli, p.173).
23. It is necessary to design jobs that will be intrinsically satisfying and challenging, making employees more responsible for the results. Career paths must be planned so as to reward economically and non-economically (Manganelli, R, P189; Smit and Cronjé, p.314).
24. The utilisation of networks in the WSPU context will add public value to the organisation that would otherwise work independently. It has become evident that value is added when managers demonstrate skill at jointly solving problems (Agranoff, (1999), p.33).
25. To be able to facilitate a network the responsible person representing the uMDM / WSA will have to be in a senior position, which encourages and justifies the establishment of a specific department with a departmental head to perform this function.
26. In terms of lines of communication and reporting procedures, the command and control model is seen to be more ineffective in organisations today. Mechanisms

should therefore be developed through which communication will not only be downward but in all directions (Manganelli, p.134-p.135; Peters, p.51-p.54).

27. It is necessary to develop a structure that will have an appropriate size and will be able to cater for the future five years. It must be decided which of the posts need to be filled immediately and which can be filled at a later date (Hunter, p.80).

5.1.1.2 Points sourced from the contextual literature review

1. In terms of the second section 84(3) notice and in terms of the municipal structures act, No. 117 of 1998, the uMDM was required to assume the WSA function and therefore be responsible for the water and sanitation provision in its area (Republic of South Africa (1998a, p.18).
2. In terms of section 78(2)(a) of the municipal systems act No. 32 of 2000, the uMDM has opted to provide municipal services in its area utilising an internal mechanism (Republic of South Africa (2000, p.72).
3. It is a requirement in terms of Section 20 (1) of Water Services Act No. 108 of 1997, that when the WSA is performing the function of a water services provider, the water services authority, being the uMDM must in terms of this legislation, manage and account separately for the function of water services provision and governing its operations (Republic of South Africa (1997, p.24).
4. From the contextual literature it is evident that the local municipalities and the uMDM do not have sufficient human resources to perform the water service provision effectively in any of the areas. The organisational structures may however be suitable in some of the local municipalities but some of the critical posts required are currently vacant. As the uMDM has not previously provided the water services operations and maintenance function, it has not provided for the full WSPU function in its current organisational structure, which has to be addressed.
5. It is proposed that the organisational structure as developed by eThekweni Water, the neighbouring metropolitan area, for the provision of water service in their area, be utilised as a reference on what a good practice is, in terms of organisational structure. The proposed structure of the uMDM will be significantly different to that of the eThekweni water structure, with some of the functions being outsourced by the uMDM

until such time as funding is available to warrant the in-house establishment of these additional resources. There are however similarities in the operational procedures to be performed by the uMDM in comparison with eThekweni water with regard to the decentralised offices and depots and these establishments will have similar staffing structures. The magnitude of the infrastructure in the uMDM is significantly smaller than that of eThekweni water and the size of the organisational structure will be significantly reduced to better suit the requirements of the existing infrastructure within the uMDM.

In consideration of the above summary, the proposed organisational / divisional structure for the uMDM was developed and is as provided in Appendices B of this report illustrating the general organisational structure and structure proposed for each of the local municipalities.

5.1.1.3 Development of the model organisational structure.

The principles for the development of the proposed organizational structures as provided above were utilized in the development of the proposed model organizational structures as has been illustrated as detailed in figures, 12 to 18 in Appendix B. The first figure No. 12 details the general organisational structure for the uMDM identifying all the posts that have been created and showing the accumulated numbers of positions allocated to those posts that are to be distributed to various local municipalities or better referred to as business units.

A small portion of those posts as presented will be centralised and stationed at the head office to minimise the duplication of staff where it is not required hence supporting the machine bureaucracy configuration structure and not the divisional structure as referred to in principle No. 12.

The six illustrations of the organisational structures that follow the general organisational structure are the proposed structures for each business unit and show changes in the number of posts occupying the various positions provided for. The number of posts

created was based on the principles as provided above, which took into consideration physical water and sanitation assets, the demographics and service level coverage, the current institutional arrangements as assessed in the review of the section 78 assessment exercise and theoretical considerations. Staffing structures were developed for each business units utilising the eThekweni Water decentralised offices staffing structures as an example of a best practice staffing structure, applying reductions in the numbers of posts and other modifications taking cognizance of the reduced scale of the operational environment of the uMDM.

5.1.2 TECHNICAL OPERATIONAL SYSTEMS FRAMEWORK

A summary of the principles as highlighted in the theoretical literature review and the comments made in the contextual literature review regarding the technical operational systems, which are utilised in developing new information technology driven systems for the uMDM's WSPU are as follows:

5.1.2.1 Principles sourced from the theoretical literature review

1. The key to competing in today's environment are quality speed and flexibility and this can be achieved through the redesign of business processes (Spur, p.157).
2. The needs of the customers and an increase in the value provided to the customer are to be met. It is important to focus on the value and not the cost, which will make the process reengineering relevant to the customer and not to the organisation itself.
3. It is necessary to identify inconsistencies and cross-functional coordination issues that need to be improved in the reengineering process.
4. Technology assists in opening up new business opportunities. It provides a platform of systems and capabilities that new working practices can be based on and it allows new systems to be put in place (Spur, p.24).
5. Although work can be done much more effectively by automating it, one should stop simply automating old ways of working; there must be a fundamentally better way of defining, organising and running a business.
6. It is important not to be seduced by the potential of technology (Spur, p.26).

7. If one focuses too much on the technical performance of the IT division one could undermine and divert innovation due to lack of business awareness.
8. Good information engineering skills are required in designing information infrastructure but often too much emphasis goes into how the process will work rather than what the new process should be. The process can be hijacked early on and turned into an information engineering exercise (Spur, p.29).
9. A good measure of the capabilities of the organisation to exploit IT for business advantage is to assess the magnitude of the corporate investment (Spur, p.29).
10. The technical design attempts to utilise technology and information jointly to improve the performance of how processes are performed (Spur, p.2).
11. There is a need, as one executive of General Electric called a “boundaryless” company, which does not have barriers between traditional functions. The use of technology is assisting the move towards such an idea but it has not yet been extended to its fullest capability (Spur, p.179).
12. The technical design stage should produce descriptions of the technology, standards, procedures, systems and controls employed in the reengineering process and how the social and technical elements are to interact (Manganelli, p.136).
13. As this is more of a specialist field and it would be more advisable to contract an external service provider with the relevant skills to do this investigation, should the organisation not have the necessary skills in-house.
14. The relationship between the technical and the social elements required to be reported on need to be determined as a basis for understanding the process to be adopted (Manganelli, p.138).
15. It is important that a thorough assessment is made of the present and the future information requirements (INGENIUM, p.4.2).
16. A proper understanding is required as to how the system will interface with other council information systems (INGENIUM, p.4.2).
17. A mechanism that enables feedback has to be included in the design of the operations reporting system (Manganelli, p.132).

18. It must be ensured that the operational reporting system matches the organisational structure and operation. The operational structure must be able to utilise the reporting system to improve and not restrict its performance (Manganelli, p.135).
19. The system must cater for future increased size and complexity of infrastructural networks and operational procedures (INGENIUM, p.4.2).
20. The system must be able to collect data for reporting and financial planning so as to optimise and provide justification for the renewal of infrastructure and capital investment programmes (INGENIUM, p.4.2).
21. The system must be able to operate over a range of hardware platforms and over a range of industry standard databases (INGENIUM, p.4.2).
22. the system must be able to interface with other corporate systems, and
23. the system must be enabled for flexible report writing (INGENIUM, p.4.2).
24. ensure that everyone will be utilising the same information facilitating common understanding in decision making (Manganelli, p.146).
25. The requirements in terms of budgets to establish the system will have to be known so as to budget for such an initiative (INGENIUM, p.4.2).
26. Whether to procure a system off the shelf, by integrating off-the-shelf components or to develop a custom solution to suit the environment.
27. For procuring off the shelf solutions one will have to investigate as to what is commercially available, talk to vendors and receive demonstrations, but only after the initial investigation of other organisations that one would benchmark oneself against, so as to make an informed analysis of all the available products (Manganelli, p.155; Spur, p.142).
28. A “TELOS” feasibility analysis must be performed on all the identified systems that are proposed for the possible adoption by the organisation for establishment (Whitten, (1994), p.815).

5.1.2.2 Factors sourced from the contextual literature review

Legislation

1. In terms of the compulsory national standards under Section 9(1) of the Water Services Act, 1997 (Act 108 of 1997), regulations were provided for by way of the Government

notice No. 22355 dated 8 June 2001. These regulations provide standards of service delivery that need to be adhered to.

2. These regulations as referred to above are stringent when applying them to the provision of services in the rural areas. Some of the stringent standards include:
 - a. the provision of at least 10 litres of potable water per person per day, should the interruption of supply exceed 24hrs (Republic of South Africa, (2001),Section 3b(i));
 - b. any major, visible or reported leak having to be repaired within 48 hours of becoming aware thereof (Republic of South Africa, (2001),Section 12);
 - c. no consumer must be without a supply for more than seven full days in any year (Republic of South Africa, (2001),Section 3b(iii)); and
 - d. that a water services institution must have a consumer service to which non-compliance with these regulations can be reported (Republic of South Africa, (2001), Section 16).

Physical water and sanitation assets

3. Umgeni water is the bulk water provider to a large percentage of the uMDM water supply schemes. The uMshwathi local municipality has 13 Urban / Peri-urban and 11 rural water supply schemes, 2 urban and 2 rural water treatment plants and 3 urban and 1 rural sewage treatment plants. The bulk water supply is provided from Umgeni water and has a radio frequency telemetry system installed to monitor the water services provision (UWP (2004a), Section 2 p.1-p.18).
4. The uMngeni local municipality has 9 Urban / Peri-urban and 2 rural water supply schemes, 1 urban water treatment plant and 2 urban sewage treatment plants. The majority of the bulk water supply is provided from Umgeni water and has a radio frequency telemetry system installed to monitor the water services provision. The municipality is currently installing GSM/GPRS telemetry units on the sewage pump stations (UWP (2004a), Section 2 p.1-p.18).
5. The Mpofana local municipality has 3 Urban / Peri-urban and 5 rural water supply schemes, 2 urban treatment plants and 1 urban sewage treatment plant. The bulk water supply is provided from river water sources and they have a radio frequency and a

GSM telemetry system installed to monitor the water services provision in Mooi River only (UWP (2004a), Section 2 p.1-p.18).

6. The Impendle local municipality has 2 Urban / Peri-urban and 15 rural water supply schemes, 1 urban and 2 rural water treatment plants and no sewage treatment plants. The bulk water supply is provided from river and borehole abstractions and no telemetry systems are installed other than a borehole monitoring system at one of the rural schemes (UWP (2004a), Section 2 p.1-p.18).
7. The Mkhambathini local municipality has 6 Urban / Peri-urban and 7 rural water supply schemes, no water treatment plants and 1 sewage treatment plant. The bulk water supply is provided from Umgeni water and has a radio frequency telemetry system installed to monitor the water services provision. No telemetry system is installed on the rural schemes (UWP (2004a), Section 2 p.1-p.18).
8. The Richmond local municipality has 8 Urban / Peri-urban and 5 rural water supply schemes, 2 urban water treatment plants and 1 urban sewage treatment plant. The bulk water supply is provided from a dam, river abstraction and boreholes. A GSM/GPRS telemetry system is installed in Richmond to monitor the water services provision (UWP (2004a), Section 2 p.1-p.18).
9. A summary of the uMDM water services infrastructure is as follows:

TABLE 10: SUMMARY OF THE UMDM WATER SCHEMES AND WATER SEWAGE TREATMENT PLANTS WITHIN THE UMDM AREA (UWP (2004a), Section 2 – Amended)

	NO. WATER SCHEMES	NO. WATER TREATMENT PLANTS	SEWAGE TREATMENT PLANTS	HIGH LEVEL OF SERVICE SUPPLY
uMGUNGUNDLOVU DISTRICT	URBAN WATER AND SANITATION			
	41	8	8	40
MUNICIPALITY	RURAL WATER AND SANITATION			
	45	4	1	11
TOTAL	86	12	9	51

Telemetry system

10. It was recommended in terms of the proposed telemetry system that an integration of three types of systems be utilised for the telemetry system namely a Radio Frequency (RF) system, a Global System for Mobile Communications (GSM) system, and a General Packet Radio Service (GPRS) system. All these three systems are required for various applications and circumstances (Business Connection (2006), p.22).
11. The way in which the technical and social elements will interact is through the software program that will be procured to receive information from the telemetry system. This software better known as a Supervisory Control and Data Acquisition (SCADA) system interprets the received information from the various sources and displays the information in a more meaningful format that can easily be interpreted by the operators (Business Connection (2006), p.8). It is proposed that a SCADA system be procured for this purpose.
12. There has to be a relationship between a various number of the entities listed above which can be explained in terms of Table 11 below. Each sender unit has a in and an out port. The in port receives information and the out port sends information.

TABLE 11: THE RELATIONSHIP BETWEEN THE TECHNICAL AND SOCIAL PROCESSES FOR THE TELEMETRY SYSTEM

River Abstraction

Information sent from the out port

Information on the status of pumps, whether on or off, on water infrastructure.
 Information as to whether the electrical power is on or off.
 Alarms indicating when intruders have entered a premises.
 The flows from bulk water meters.
 The pressure in the pipeline at the river pumps
 Information on when the pumps are not responding to a request from the reservoir level indicator to start or stop pumping

(Message sent to)

Central control	Local Operator

Information received from the in port

Information from the Reservoir level indicator (When to pump and when to stop pumping)
 Information from central control to Start / Stop the pumps

(Message received from)

Central control	Local Operator	Reservoir

Borehole Abstraction pumps

Information sent from the out port

Information on the status of pumps, whether on or off, on water infrastructure.
 Information as to whether the electrical power is on or off.
 Alarms indicating when intruders have entered a premises.
 The flows from bulk water meters.
 The pressure in the pipeline at the river pumps
 Monitoring of the water levels in the boreholes frequently.
 Information on when the pumps are not responding to a request from the reservoir level indicator to start or stop pumping

(Message sent to)

Central control	Local Operator

Information received from the in port

Information from the Reservoir level indicator (When to pump and when to stop pumping)
 Information from central control to Start / Stop the pumps

(Message received from)

Central control	Local Operator	Reservoir

Reservoirs

Information sent from the out port

Information on the water level within the reservoir (general level info)
 Send alarm when the water level overflows / drops very quickly / very low level mark
 Send message to the pumps when the water level reaches a low level mark and High level Mark
 The flows from bulk water meters.
 Information on the when a battery is to be replaced.
 Alarms indicating when intruders have entered a premises.

(Message sent to)

Central control	Local Operator	Source Pumps

Sewerage Pump Station

Information sent from the out port

Information on the status of pumps, whether on or off, on sewerage infrastructure.
 Information as to whether the electrical power is on or off.
 Alarms indicating when intruders have entered a premises.
 The flows from ultrasonic meters.
 Monitoring of the effluent levels in the sumps.
 Send alarm when the effluent level overflows.
 Information on when the pumps are not responding to a request from the effluent level indicator to start or stop pumping

(Message received from)

Central control	Local Operator

Information received from the in port

Information from central control to Start / Stop the pumps

(Message sent from)

Central control	Local Operator

Operations reporting system

13. In terms of the operations reporting system as stated in principle 27, the benchmarking of ones own system with another organisation is a big advantage and when one is constrained by the allowable time to procure a system it is often quicker to purchase an off the shelf product that will meet the majority of ones requirements and then modify or customise portions of the product that one has acquired.
14. The performance of a “TELOS” feasibility analysis is required to be performed on any IT system that is proposed for adoption. A “TELOS” analysis was performed on the “Faultman reporting system” that was given to the uMDM by eThekweni Water, before the system was approved for installation, as if it was an off the shelf product. The “Faultman” system was found to be very suitable for utilisation by the uMDM’s information technology and proposed WSPU environment; however it will still have to be tested for confirmation of suitability (Whitten (1994), p815).

IT Network requirements

15. One of the legislative requirements for local government is that all government and parastatals must be e-governance compliant by the year 2010 (uMDM (2005a), p.3).
16. It is required that the uMDM will transform from a local area network functionality into a wide area network functionality (uMDM (2005a), p.4).
17. As the uMDM is establishing a WSPU it will be required to link decentralised offices to the uMDM for online assistance to be provided to the local municipalities by the uMDM as a support agent, the transfer of financial information, the functioning of the operational reporting system and the telemetry system.
18. As a result of cost benefits and the number of criteria as mentioned in the text, the establishment of a VPN would be a good approach (uMDM (2005c), p.3; Telkom (2006), p.7-p.10).

5.1.2.3 Adoption of the Technical Operational Systems Framework

In consideration of the above summary of principles and contextual points, the proposed model frameworks in terms of technical operational systems are adopted as follow:

Telemetry information technology system

It is proposed that in terms of a model information technology framework that the telemetry system that integrates three types of systems be utilised for the telemetry system namely a Radio Frequency (RF) system, a Global System for Mobile Communications (GSM) system, and a General Packet Radio Service (GPRS) system. All these three systems are required for various applications and circumstances.

As part of the IT system it is necessary that a SCADA package be included in the model framework, which will assist the operator in interpreting the information that is sent from each sender unit that is installed for various purposes.

Operations reporting, information technology system

The other “informat” system proposed for the WSPU is that of the operations reporting system. This system is critical for addressing all the principles extracted from the literature review.

The utilisation of the “Faultman” operating reporting system is proposed as the model framework in terms of a reporting system. The receipt of this system from eThekweni Water may be interpreted in this investigation as being procured off the shelf but with very little additional functionality required or need to customise it as it has been in operation for over 10 years and is still regarded as comparable to the latest similar software.

Adoption of the Model Wide Area Network for the uMDM

It is proposed that in terms of a wide area network, that Virtual Private Network be adopted due to the number of benefits that it provides as clearly explained in the contextual literature review.

5.1.3 Re-engineering Roll-out Programme

The first issue to be addressed in the reengineering programme is that a timeline must be developed for the required operational processes that have been defined, which will give appropriate guidance to the reengineering team (Manganelli, p.57)

The second issue to be defined is the cost that will be associated with the establishment of the WSPU, which has been referred to previously in terms of the WSPU establishment. Funds will have to be acquired for the implementation of the programme as is to be defined.

The third issue is that management will have to understand the concept of risk and the project team must know what the feelings of management is in terms of risk. How much risk is the organisation willing to allow in the reengineering process. A totally new operational unit is about to be established and management will have to let go of the existing tried and proven methodologies and give way to the birthing of a new structure and operational procedures. There comes a point during the establishment programme where it will become very difficult to change course or discontinue the establishment.

The fourth issue is the social dimension. It is expected that the new operations division is required to be productive and efficient. The operational budgets need to be on a tight reign and this means that the staffs complement needs to be at a minimum. As a result of the reengineering process it may be necessary to make some posts redundant and re-skill some employees. It is possible that business partners, agencies and suppliers etc. will become part of the new operating structure. Will making posts redundant so as to make way for improved performance with the use of a business partner be acceptable to the management of the organisation?

The reengineering team must understand managements' view on the above dimensions and must have management buy in from the beginning of the process as in the reengineering process these are normally the outcomes. Without commitment from

management and their understanding of the above process, the process should not be embarked upon. If there is no commitment from management this could just be a fruitless exercise, raising contention and distrust and demotivating staff who would be part of this whole process with their own expectations.

As mentioned previously there will be a number of disciplines and departments represented in the reengineering team. The entire programme that will be developed must be developed in an integrated manner with each representative performing his/her function and stipulating everything that he /she will have to perform to effectively establish the WSPU. Most aspects in this reengineering exercise are interrelated but more prominent in this reengineering process is that of the human resources staffing structure, technical operational procedures, and financial controls and reporting, which will all be interacting with information technology in the transformation. As referred to previously this process should for various reasons take approximately a year to complete and therefore due to the time constraints, a comprehensive programme will have to be developed so as to assist in keeping the team focussed on the programme. As mentioned elsewhere it is also vital that a strong facilitator be appointed to coordinate this transformation process and in particular the initial processes.

Reference is made to the programme as developed for the establishment of the uMDM WSPU. The researcher utilised the project management tool namely Microsoft projects to capture the programme, which worked well for purposes of monitoring however for all members of the team to have access to the programme it was found that the standard spreadsheet program better facilitated interaction with the programme. It must be noted that the facilitator of the reengineering team was the Executive Manager: Water Services Authority, however the researcher played a prominent role in the entire programme and he was the only member of the team that was able to commit almost 100% of his time solely on this reengineering process.

The various representatives on the team contributed to the scope of work as detailed in the programme and as attached as Appendix C to this report. In this process which can be

referred to as the identification process the team members identified the major business / operational processes, how these different processes interfaced with each other and the customer, and what the strategic value added processes were (Manganelli, R, P75). The reengineering team however was not able to allocate an appropriate time-line to the programme as the time available was dictated by the termination date of the water services provision agreements with the local municipalities, after which the uMDM would have to take over the function of water services provider. The team was given the equivalent of six months to reengineer the WSPU function after some ground work had previously been performed by a previous team. The previous team had successfully managed to get the water and sanitation financial function in the local municipalities separated (ring-fenced) from the rest of the functions that were provided by the local municipalities.

It was evident that the programme set for the establishment of the WSPU would be extremely difficult to achieve and although if all things went smoothly it may have been achievable. There were some obstacles that presented themselves and the establishment of the WSPU did not meet the date set for its establishment. The reasons for these delays will not be discussed here but will be referred to in the conclusion of this report as the critical factors that must be considered when embarking on a reengineering programme.

5.2 ANALYSIS OF THE CURRENT VERSES THE PROPOSED STAFF COMPLEMENT AND FUTURE FINANCIAL CONSIDERATIONS

The current local and district municipality organisational structures have been provided in Appendix A of this report, for which an analysis was performed in terms of the current staff complement and comparing this with the proposed staff compliment using the framework organisational structure as attached as Appendix B of the report as the model structure. Following this analysis and the findings of the interviews in section 5.3, a “SWOT” analysis will be performed on the current situations taking cognizance of the new organisational structure and systems that are proposed.

5.2.1 Staff Complement

5.2.1.1 uMshwathi Business Unit area

From the organisational structure as extracted from the findings of the section 78 assessment of the uMshwathi local municipality it is difficult to compare the staff complement with the model framework. There are also additional staff that have been transferred from the Umgeni water utility to the uMDM that have been assigned to work in the rural areas of uMshwathi and there are further personnel that are in the process of being transferred to the uMDM from the Department of Works (DOW). It is therefore proposed that one looks at the current number of staff employed in the area who are working in the water and sanitation provision function, and compare this number to the number of proposed positions in the uMshwathi local municipality area, as provided in the framework model.

Table 12 as provided in Appendix D identifies the number of staff as proposed compared to the number of staff currently employed and indicates the posts to be filled as a matter of urgency and those posts that must be filled in the short term.

5.2.1.2 uMngeni municipal area

From the organisational structure as extracted from the findings of the section 78 assessment of the uMngeni local municipality it is evident that the local municipality were able to provide an adequate service to the municipality however some of the provision function was outsourced to service providers and there were vacant positions that had not been filled.

Table 13 as provided in Appendix D identifies the number of staff as proposed compared to the number of staff currently employed and indicates the posts to be filled as a matter of urgency and those posts that must be filled in the short term.

5.2.1.3 Mpofana municipal area

From the organisational structure as extracted from the findings of the section 78 assessment of the Mpofana local municipality it is evident that the local municipality were able to provide a suitable service to the municipalities urban areas however there were some critical positions that were not provided for and there staff complement had not increased to cater for the rural areas that they inherited. There are also vacant positions that are required to be filled, which has been pending the final decision of the WSPU establishment.

Table 14 as provided in Appendix D identifies the number of staff as proposed compared to the number of staff currently employed and indicates the posts to be filled as a matter of urgency and those posts that must be filled in the short term.

5.2.1.4 Impendle municipal area

From the organisational structure as extracted from the findings of the section 78 assessment of the Impendle local municipality it is evident that the local municipality had limited staff as provided in their organisational structure however not all the posts were filled and there were some positions that were not provided for. There staff complement does not cater for the rural areas that are being provided with new infrastructure that will have to be addressed.

Table 15 as provided in Appendix D identifies the number of staff as proposed compared to the number of staff currently employed and indicates the posts to be filled as a matter of urgency and those posts that must be filled in the short term.

5.2.1.5 Mkhambathini municipal area

From the organisational structure as extracted from the findings of the section 78 assessment of the Mkhambathini local municipality it is evident that the local municipality is not in a position to provide the municipal function as the provision function had been totally outsourced to the Umgeni Water utility.

There is a major water supply project planned for this area that the uMDM will have to plan for in terms of institutional arrangements and for which the proposed staffing structure will be able to address for the next five years. The proposed staffing structure provides for the provision function to the rural areas that already have infrastructure.

Table 16 as provided in Appendix D identifies the number of staff as proposed indicating the posts to be filled as a matter of urgency and those posts that must be filled in the short term.

5.2.1.6 Richmond municipal area

From the organisational structure as extracted from the findings of the section 78 assessment, of the Richmond local municipality it is difficult to compare the staff complement with the model framework. There are additional staff that are to be transferred to the WSPU from previous projects that were implemented in the Indaleni area and other staff that have been employed but are not reflected in the organisational structure. It is therefore again proposed that one look at the current number of staff employed in the area who are working in the water and sanitation provision function, and compare this number to the number of proposed positions in the Richmond local municipality area, as provided in the framework model.

Table 17 as provided in Appendix D identifies the number of staff as proposed compared to the number of staff currently employed and indicates the posts to be filled as a matter of urgency and those posts that must be filled in the short term.

5.2.1.7 uMgungundlovu District Municipality – Head office

From the organisational structure as provided by the uMDM it is evident that there are almost no staff allocated to this water service provision function. The only staff that are available are those staff that will be shared with the Emergency services section of the uMDM. The uMDM therefore do not have the required staff to perform this function and will have to employ many staff in the immediate future and a few in the short term.

Table 18 as provided in Appendix D identifies the number of staff as proposed compared to the number of staff currently employed and indicates the posts to be filled as a matter of urgency and those posts that must be filled in the short term.

5.2.2 Financial Analysis

In terms of the financial aspects that need to be taken into consideration, there has already been some information provided in the contextual review regarding the estimated operational costs that was provided as sourced from the section 78 assessment performed on the uMDM. As was highlighted, it was the impression of the researcher that additional costs would have to be added to those referred to, for un-accounted for water that would be provided by the WSPU, that had not been taken into account in the financial schedule provided. It was also a concern to the researcher regarding the source of the parameters utilised as it is assumed that the administration costs that were incorporated in the parameters would have been based on an average salary paid to those whose costs would accrue to the WSPU function.

It is known that the salaries provided by the uMDM are higher than the average salary level paid by other institutions and therefore it was thought that the parameters would be understating the estimate cost to the uMDM for the provision of the service. This is however not the case as a calculation was performed by halving the cost for the provision of services and adding the cost per household per month for the full cost of salaries proposed in the new structure. These calculated costs were found to be equal to that as provided by the parameters, even when taking inflation into account.

For the purpose of the calculations that will be provided in this paper the parameters utilised in the sections 78 assessment are revised slightly in accordance with a study that has been performed by Hazelton, D. (2006) in the draft paper titled “Sanitation and the new formula for calculating equitable share payments to local government”, dated January 2006. The table below is an extract from this draft paper indicating the current operating costs.

TABLE 19: CURRENTLY USED INDICATIVE OPERATING COSTS FOR EACH BASIC SERVICE (Hazelton, p.8)

Service	Serviced households			Un-serviced households		
	Rand per month	Rand per year	Percentage of total	Rand per month	Rand per year	Percentage of total
Energy	40	480	30.7	15	180	11.5
Refuse	30	360	23.1	10	120	7.7
Water	30	360	23.1	10	120	7.7
Sanitation	30	360	23.1	10	120	7.7
Total	130	1560	100	45	540	34.6

Note: the last column reflects percentages as a percentage of the total indicative cost of supplying the full basket of services to serviced households

To take care of inflation some of the parameters have been increased by 12 % to cater for the increase over the past two years. The water losses percentage for the rural water reticulation schemes was increased from 25% to 50% to be more in line with the study performed by Partners in Development (Still, p.8).

The old and revised parameter costs to be utilised are as follows:

TABLE 20: THE OLD AND REVISED PARAMETERS UTILISED TO CALCULATE THE THEORETICAL FINANCIAL SUMMARY FOR EXPENDITURE, INCOME AND THE REQUIRED TARIFF.

(UWP (2004b), p.26 - amended)

Consumption:	Old Parameter	Revised Parameter	
House connections	200	200	l/p/d
Yard connections:	80	80	l/p/d
Basic level of Service:	25	25	l/p/d
Commercial Demands:	30%	30%	
Water Losses (urban):	15%	30%	
Free Basic Service:	6	6	Kl/hh/month
Assumed tariff:	4	To be calculated	R/Kl
Cost recovery (Urban)	80%	80%	
Cost recovery (Rural)	30%	30%	
Water losses and commercial rural	25%	50%	

Operation and Maintenance Costs:			
House connections:	R 55	R 62	R/hh/month
Yard connections:	R 35	R 39	R/hh/month
Basic Service Standpipes:	R 20	R 22	R/hh/month
Below basic service standpipes:	R 15	R 17	R/hh/month
Waterborne sanitation:	R 10	R 50	R/hh/month
VIP sanitation service:	R 5	R30	R/hh/month
Bulk water tariff:	2.5	2.80	R/Kl

There are other cost considerations that must be considered related to the capital expenditure required to set up the WSPU that are indicated in Table 20 below. There is a requirement to set up decentralised offices in initially 5 of the six business units, machinery and equipment that will not be transferred to the uMDM will have to be procured and the information technology systems will have to be procured or hired.

It is proposed that the funds be acquired by way of a loan through the Development Bank of South Africa or other financial institutions and the repayments be factored into the calculation of the rates to be charged for water consumption.

The Capital Costs are estimated as follows:

TABLE 21: THE ESTIMATED CAPITAL COSTS REQUIRED TO ESTABLISH THE WSPU

ESTIMATED COST TO ESTABLISH THE WSPU	
Property including infrastructure	R 9,500,000.00
Plant and Vehicles	R 15,200,000.00
Aerial photography	R 1,600,000.00
Estimate telemetry	R 3,570,000.00
Estimated VPN Installation	R 65,000.00
Estimate Cost for the above items	R 29,935,000.00
Contingencies (5%)	R 1,496,750.00
Total Estimated Cost	R 31,431,750.00

Another option for the procurement of the telemetry equipment would be to lease it over 36 months after which it becomes owned by the uMDM. There are some capital costs associated with the lease as shown below. This option for the provision of the telemetry system will be adopted for the purposes of the calculations provided herein.

TABLE 22: THE ESTIMATED CAPITAL COSTS REQUIRED TO ESTABLISH THE TELEMETRY SYSTEM

COSTS FOR THE TELEMETRY SYSTEM	
Capital required	R 154,500.00
Installation Costs (Telemetry Hardware)	R 504,000.00
Lease telemetry Hardware to purchase (36 Months)	R 129,564.70 Per month
Renting of Computers	R 5,250.00 Per month

Funds for the replacement of infrastructure costs will also have to be taken into consideration. For the purpose of this calculation it will be assumed that the cost for the existing infrastructure is approximately R2000 per person. Taking the current number of households with water connections of 45000 and a number of 4.85 persons per household, the total cost of infrastructure is R 436,500,000.00. This infrastructure should be replaced every 60 years and therefore the cost per month to be allocated to replacement of infrastructure is R 7,275,000.00 per year. This figure would increase as additional infrastructure is provided. Costs are also to be provided for the replacement of plant and vehicles and it is estimated that this plant will be replaced on average every 10 years. The replacement costs for the plant and vehicles amounts to R 1,520,000.00.

Table 23 below provides a summary of the yearly payments for the capital expenditure required. It is proposed that a loan be sourced for an amount of R 31,431,750.00 at an interest rate of 9%, with a repayment period of 20 years. The total annual capital cost amounts to an estimated R 13,743,372 as shown below.

TABLE 23: THE CAPITAL EXPENDITURE REQUIRED TO ESTABLISH THE UMDM

Capital Debt mortgage repayment (R31,4Mil @ 9% for 20 years)	R 3,393,595
Infrastructure replacement costs	R 8,795,000
Monthly installments for the telemetry system	R 1,554,776
ANNUAL REPAYMENTS	R 13,743,372

Utilising the revised parameters as shown in Table 20 above, the tables 24 and 25 reveal the expenditure and the proposed tariff required to cover the expenses. These tables can be compared to the summary of financial information as provided in the contextual review. It must further be noted that the new calculations take into account the losses due to unaccounted for water that would be provided from sources, provided by the uMDM and Umgeni water as the bulk service provider.

Taking all the above mentioned costs into consideration the following tables Nos. 24 and 25 were developed indicating the assumed total costs, total revenue, the equitable share allocation to be provided and indicating what the tariff is expected to be set at for the provision of this service when utilising the structures and systems previously developed in this paper.

Table 24 indicates the current situation and table 25 indicates the scenario when the entire population within the uMDM excluding the uMsundusi Local municipality is provided with water with at least an RDP standard of service.

To be able to provide an affordable service to the consumer it is required that 45% of the entire equitable share allocation be allocated to the water and sanitation provision in the

immediate term and the this be increased to 52% when the entire uMDM has been serviced with water and sanitation infrastructure.

The calculated rate of R7,55 per kilolitre in the immediate term and the increase to R7,80 per kilolitre in the future to cater for the provision to the entire uMDM population is in the opinion of the researcher acceptable. These tariffs provide for unaccounted for water provisions that are normal for the rural and urban environments, which is expected to be reduced, and which will therefore reduce the costs for the provision of the service. With good social interventions it will also be expected that the payment for water will be improved in the future, which will also improve the financial situation.

The success of the uMDM's ability to succeed in this WSPU function depends heavily on the allocation of a substantial portion of the equitable share to this function and it will be necessary to receive commitment from the uMDM council on this matter before any further developments into the process of establishment is effected. As can be deduced from the tables below it is necessary that approximately R60 million of the equitable share is required immediately for allocation to the water and sanitation function. This should comprise approximately of the total services component and an additional R21 million from the levy replacement grant component of the 2006/07 financial year. The Equitable Share allocations are as previously provided in Table 6, in the contextual literature review.

The calculation assuming that the entire uMDM is serviced indicates that approximately R70 million of the Equitable Share is required for allocation to the water and sanitation function. More of the levy replacement grant should be allocated to the water and sanitation provision function in this case. The tables providing the summary of the financial assessment are as follows:

5.3 INTERPRETATION OF THE RESULTS OF THE INTERVIEWS

Structured questionnaires were developed as preparation for the interviews with the technical managers of the six local municipalities and the uMDM as is attached in Appendix E of this report. There were eight personnel that were interviewed using the above questionnaire, each from their respective local municipalities and the uMDM. It was fortunate that two personnel from the uMDM and a previous employee of the uMngeni local municipality were able to be interviewed.

Each interviewee responded very well to the questionnaire giving insight and their professional comment. Some minor adjustments of the provided framework were agreed to and will be provided as such in the recommendations of this dissertation.

Comments were requested from the participants of the interviews on the following issues as listed below with the results of the questionnaires as provided in Appendix F of this report.

The questionnaire included questions on the following aspects:

- The local municipalities current organisational structure and institutional arrangements;
- Confirmation on the number of staff employed and whom will be transferred to the uMDM for the placement into the new organisational structure;
- Comments on the proposed new structure and systems to be utilised by the uMDM;
- The condition of the water and sanitation infrastructure in the municipality that is under their supervision;
- The availability of plant, equipment and materials;
- Information of the operations functionality;

- Information on the operations reporting systems in the municipality; and
- Information on any information technology reporting systems e.g. telemetry, that is utilised in the municipality.

The results as referred to above can be further analysed to provide more meaningful information on the current situation and the impression of the proposed structure in an aggregated manner. It must be noted that although the point system utilised in the questionnaires was a scale between 0 and 5, these received scores were doubled in the representation thereof so as to increase the scale for clearer representation and a scale of between 0 and 10 was finally adopted in the interpretation of the results.

The interpretation as shown below was derived from the results of the questionnaire as provided in Appendix F, utilising the procedures as explained in the Data Analysis section of the Research Design Chapter in this dissertation.

The results of the interviews in terms of the current and the proposed structures and systems are provided in Table 26 and illustrated in Figure 19 as follows:

TABLE 26: SUMMARY OF THE FINDINGS FROM THE INTERVIEWS CONDUCTED

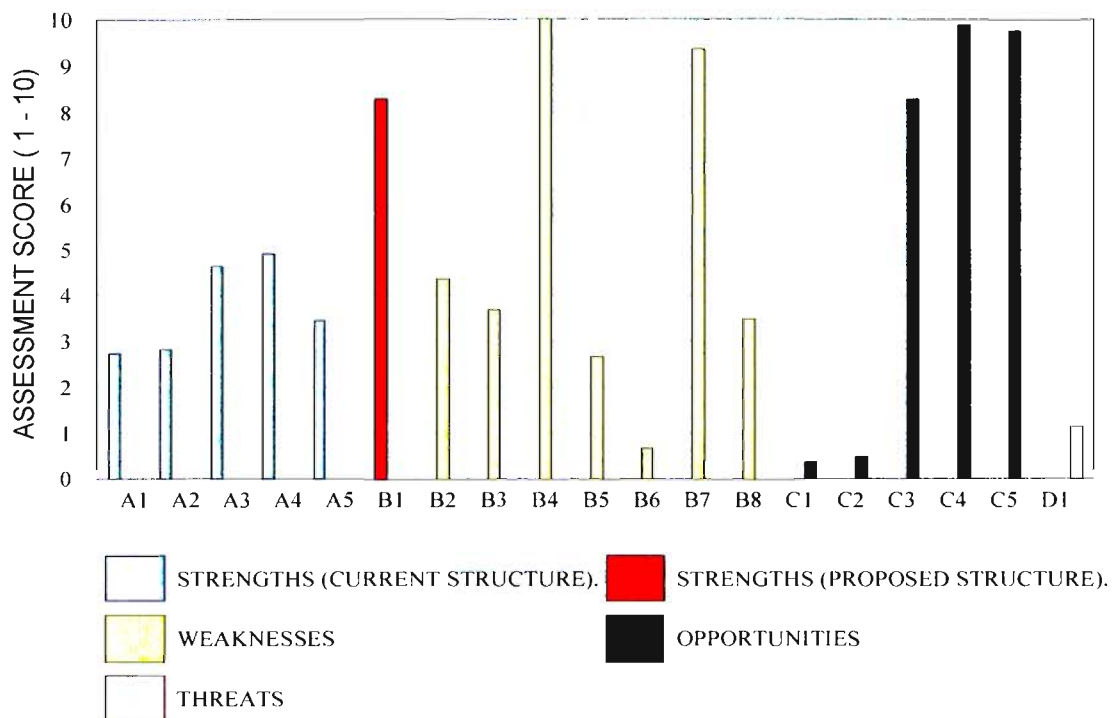
MUNICIPALITY	“SWOT”	OPERATIONAL ASPECTS	RATING
Mpofana, Richmond, UMDM, Umngeni, Umshwathi, Impendle, and Mkhambathini	Strength	Current Structure Average	2.73
Richmond, Umshwathi, Mkhambathini, Umngeni, and Mpofana	Strength	Infrastructure Average	2.81
Umshwathi, Impendle, Umngeni, Mpofana, Mkhambathini, and Richmond	Strength	Operations Average	4.63

Richmond, Mpofana, Mkhambathini, Umshwathi, Umngeni, and Impendle	Strength	Plant, equipment and materials Average	4.92
Umngeni, Umshwathi, Impendle, Mkhambathini, Mpofana, and Richmond	Strength	Technical Information systems Average	3.44
<i>Strength Average (Current Structure)</i>			<u>3.71</u>
Mpofana, Richmond, UMDM, Umngeni, Umshwathi, Impendle, and Mkhambathini	Strength	Proposed Structure Average	8.29
<i>Strength Average (Proposed Structure)</i>			<u>8.29</u>
Mpofana, Richmond, UMDM, Umngeni, Umshwathi, Impendle, and Mkhambathini	Weakness	Current Structure Average	4.36
Mpofana, Richmond, UMDM, Umngeni, Umshwathi, Impendle, and Mkhambathini	Weakness	Infrastructure Average	3.68
Umshwathi, Impendle, Umngeni, Mpofana, Mkhambathini, and Richmond	Weakness	Operations Average	2.1
Umshwathi, Impendle, Umngeni, Mpofana, Mkhambathini, and Richmond	Weakness	Plant, equipment and materials Average	2.67
Mkhambathini Mpofana	Weakness	Proposed Structure Average	0.67
Mpofana, Richmond, UMDM, Umngeni, Umshwathi, Impendle, and Mkhambathini	Weakness	Reporting Information Systems Average	9.36
Mpofana, Richmond, UMDM, Umngeni, Umshwathi, Impendle, and Mkhambathini	Weakness	Technical Information systems Average	3.48
<i>Weakness Average</i>			<u>4.19</u>
UMDM	Opportunity	Current Structure Average	0.36
Impendle, Richmond, Mpofana, Umshwathi and Umngeni	Opportunity	Operations Average	0.48

Mpofana, Richmond, UMDM, Umngeni, Umshwathi, Impendle, and Mkhambathini	Opportunity	Proposed Structure Average	8.29
Mpofana, Richmond, UMDM, Umngeni, Umshwathi, Impendle, and Mkhambathini	Opportunity	Proposed Reporting Information Systems Average	9.88
Umshwathi, Impendle, Umngeni, Mpofana, Mkhambathini, and Richmond	Opportunity	Proposed Technical Information systems Average	9.75
<u>Opportunity Average</u>			<u>7.25</u>
Mpofana	Threat	Infrastructure Average	1.14
<u>Threat Average</u>			<u>1.14</u>

FIGURE 19: SUMMARY OF THE INVESTIGATIONS OF THE CURRENT VERSES THE PROPOSED INSTITUTIONAL ARRANGEMENTS AND OPERATIONAL ASPECTS OF THE LOCAL MUNICIPALITIES.

INVESTIGATIONS OF THE CURRENT & PROPOSED INSTITUTIONAL & OPERATIONAL ASPECTS



The labels as referred to on the X axis of the above graph refer to that as provided in legend below.

LABEL	DESCRIPTION	LABEL	DESCRIPTION
STRENGTHS (CURRENT STRUCTURE)		B5	Plant, equipment and materials Average
A1	Current Structure	B6	Proposed Structure Average
A2	Infrastructure	B7	Reporting Information Systems Average
A3	Operations	B8	Technical Information systems Average
A4	Plant, equipment and materials	OPPORTUNITIES	
A5	Technical Information systems	C1	Current Structure Average
STRENGTHS (PROPOSED STRUCTURE)		C2	Operations Average
B1	Proposed Structure Average	C3	Proposed Structure Average
WEAKNESSES		C4	Proposed Reporting Information Systems Average
B2	Current Structure Average	C5	Proposed Technical Information systems Average
B3	Infrastructure Average	THREATS	
B4	Operations Average	D1	Infrastructure Average

As is highlighted above with an assessment score of 2.73 out of 10, the current organisational structure of the local municipalities who are currently the water services providers is not suitable for the proper functioning of the water services function. There are not sufficient skilled human resources, which prevents the proper functioning of the provision structure in a manner that would promote customer service and a good environment to motivate the staff.

The infrastructure in the municipalities is in a bad state of repair and as indicated above with an assessment score of 2.8 out of 10, will require the replacement thereof on a continuous basis. The score of 4.63, which represents the strength of the current arrangements to practically provide the provision function when considering the work load that has to be attended to is not an acceptable score when one considers that this service is critical for achieving customer satisfaction. The municipalities neither have sufficient plant and equipment to effectively carry out their services; neither do they have much in the way of technical information systems, which would help them to manage their system better.

The interviewee's welcomed the new organisational structure proposal stating that it was adequate for the provision function. The researcher encouraged the interviewee's to try and reduce the proposed number of staff, however it was difficult to reduce the minimal number that has been proposed. Some minor adjustments were proposed for the change in post designations and a few reductions by removing some posts and having the same staff work in the rural and urban areas and not distinguishing between the areas for now. The proposal scored an 8.29 out of 10.

When considering the weaknesses the final score measured 4.19 out of 10. The following aspects were considered as weaknesses namely the current structure, the infrastructure, physical operations procedures, the lack of plant and equipment, the reporting and information systems. Some of this has already been explained. The municipalities have little investment in technology and information systems, and it was felt that this had to be addressed. A minor weakness was expressed in the proposed structure in terms of not having specified the number of water bailiffs. The number of these staff is currently not known and as the salaries of such personnel will be insignificant to the overall picture the number allocated to these positions would be confirmed at a later date.

The major opportunities were obviously the proposed organisational structure, reporting and information technology systems. It was believed that with these improvements the provision function would improve remarkably. The opportunities scored a 7.25.

Not many threats were mentioned in the formal questions other than the condition of the infrastructure that will require capital funding for the refurbishment thereof. There were comments made by some interviewee's that were a cause for concern and will be referred below.

Comments were made in terms of strengths, weaknesses, opportunities and threats that were not referred to in the formal questions. As will be referred to below, the comments will be raised as provided by the interviewee's.

Strengths

- The uMDM has the financial muscle to be able to establish a WSPU unit.
- The district has the intellectual capital to assist the strategic team of the uMDM and has suitably qualified and dedicated staff that are able to assist with adequate planning for the WSPU, with much support from the technical services department.
- Support is available from most of the LM's for the establishment of the WSPU.
- The current staff in the LM's are a keen and hard working team and gets through the work under trying circumstances. Most LM's are able to get the work done in a reasonable, time and are relatively reliable.
- Bulk water is provided by Umgeni Water to a large percentage of the uMDM consumers.
- There is a telemetry system installed on the bulk water reservoirs of the Umgeni Water infrastructure and some other telemetry in some LM's.

Weaknesses

- The slow decision making processes is a major weakness in the uMDM.
- The financial budget is not correctly allocated to the core function of water services provision.
- There does not seem to be a strategic team to make major decisions e.g. reaching metro status, and there is a lack of utilisation of existing intellectual capital that could support the strategic team.
- There is a lack of capacity and systems within the uMDM for the acquisition of required materials that will be required for the WSPU.
- The time it has taken to complete the Section 78 and the lack in giving attention to the phase 2 of the section 78 assessment is a concern.
- There is some reluctance of one LM to work with the uMDM in the establishment process.
- In the uMshwathi LM the water service provision is provided by different organisations namely the uMshwathi LM, District & Umgeni Water, and the Department of Works, with no clear communication between the institutions.

- There is a lack in most LM's of their current staffing structure and one LM does not have any internal staff allocated to water services provision as they outsource the function.
- Because of the high shortage of staff there is very little preventative maintenance performed and it is difficult to plan because they are continually attending to emergencies on an ad-hoc basis.
- A large percentage of the water infrastructure is in disrepair and the treatment works are in a bad state of operation.
- All the above leads to bad service delivery to customers.

Opportunities

- There is the opportunity to add and subtract on the proposed structure before finalisation by council after receiving more input during the consolidation process.
- The creation of the new structure is giving mileage towards the declaration of Metropolitan status by the demarcation board.
- The uMDM could take over the WSA status of the uMsundusi Municipality.
- The new structure presents opportunities to become a metro and be able to function by adding a business unit and other additional posts.
- The proposed structure can function as an entity with or without realising the Metro status.
- The establishment will enable parity of tariffs and ensure free basic water to all, in terms of legislation.
- The coordinated management of the whole area by one service provider will be an advantage.
- Outsourcing of meter reading may be possible throughout the entire uMDM which will assist some municipal areas.
- With the establishment of an internal WSPU mechanism there would be staff allocated to LM's where no permanent staff currently exist and there will be a unifying of current staff reporting to other institutions and providers into one institution. These staff have been waiting for finalisation of this issue.

- The bulk water pipeline of Umgeni Water provides a reliable treated source to a large portion of the uMDM and its utilisation can be extended.
- The majority of the LM's are reasonably close to Pietermaritzburg.

Threats

- The LM's (Current WSP's) could desert us and refuse to be WSP's for the uMDM.
- Some LM's may apply for their own WSA status.
- There unfortunately seems to be an inadequate allocation of funds to put a correctly sized staffing structure in place.
- The eventual costs of running the provision function may not support the decision taken to adopt the internal mechanism, should sufficient funds from the equitable share grant funding not be allocated to this function.
- It has been proposed that the O&M costs must be within 35% of the total uMDM budget.
- The water services infrastructure has been neglected and is run down. This is common amongst the LM's and will cost a substantial amount to restore in the future. The uMDM must start immediately with this so as to reduce its effect later on.
- There is a high sick rate amongst workers in the LM's.

5.3.1 Reengineering, implementation rollout programme.

Interviews were held with the reengineering team where the establishment programme was discussed. Requests were made from the researcher to add or omit to or from the programme developed for the establishment that is currently being performed. It was necessary to revise the time-lines provided for in the programme.

As the researcher was on the team, he has made his own adjustments to the technical programme. The comments provided by the remaining representatives on the team regarding the planning, human resources, Water services authority, finance, and information technology aspects are provided for below in an aggregated format so as not to be able to assign specific comments to specific individuals. This is necessary due to the

nature and openness of the comments that were made. It must be noted that the researcher does not necessarily agree with all the comments made.

5.3.1.1 Composition of the WSPU task team

- The WSPU task team was well represented however more union representation and representation from the Local municipalities is required.
- The facilitation of the WSPU task team by the Exec Manager: WSA was good.
- There should have been people who have authority to make decisions, on the task team.
- The whole process should have been lead by the top management of the District with delegation of tasks to junior staff.
- It was believed that the project management unit of the technical services department should have been represented
- It was believed that two steering committees were required, one as the District steering committee that was created and another, which would include the Local Municipality representatives.

5.3.1.2 Provision of the programme and its implementation

- The programme was fully representative however the timelines were not achievable and the scope was felt to be too comprehensive.
- Some of the items could have been performed after the establishment.
- Due to the time constraints the programme had to be cut down to just the priority tasks.
- The programme rollout was hindered due to the lack of authority of the task members to make decisions.
- There were inadequate resources provided in terms of personal, materials and transport to carry out the programme.
- The programme was perfect however the commitment from some members was a problem as the finance and human resources representation was changed during the process as officials left the organisation.

Representation from the supply chain management and budget sections of finance would have been well received.

5.3.1.3 Concerns

- There was a lack of political buy-in, which was a hindrance. Their buy-in was informal not formal.
- Delays in receiving resolution from LM's and DM's hindered progress.
- It was difficult to get resolutions confirmed through management structures.
- It was a challenge for the information technology representative to take part in all the required activities due his affiliation to an external service provider who may want to tender on information technology related infrastructure and services required by the uMDM.
- Alignment of some positions in the organogram e.g. the water meter readers, is a concern.

5.3.1.4 Strengths

- The composition of the team consisted of competent people from various departments.
- There was a good team spirit between task team members and good collaboration between different departments.
- The facilitator of the team and his administrative support staff worked very well with the team.
- Direction in the process and the coordination of the team was performed well. The frequency of meetings held was generally good.

5.3.1.5 Weaknesses

- The team focused on all the Local municipalities where they could have focused on only selected ones at a time.
- The duration of 6 months given to establish the WSPU was not achievable.
- The Local municipalities were not engaged continuously and not fully involved throughout the process.

- Some representatives left the organisation during the process resulting in the corporate services department not showing consistency of representation.
- There was not sufficient formal political buy-in.
- There were delays in receiving resolutions from the local municipalities and district municipalities.
- There were inadequate resources provided by the organisation in terms of personal, materials and transport to perform the activities expected of some departments.
- The changing of representation of task team members from finance and corporate services created some discontinuity.
- Support from some senior management in the finalisation of the process was lacking.
- There was a lack of allocation of funding for the WSPU establishment.
- The attitude of some of the Local municipalities towards the WSPU task team did not support intergovernmental cooperation.

5.3.1.6 Opportunities

- The process brought different departments together which enabled an environment conducive to easily create one department.
- Through the process one was able to understand one's role with regard to the provision of water services to the people more clearly.
- The project has provided growth to the council and personal growth to employees of the council.
- The creation of the new structure allows for the clearing of the slate and starting afresh with financial issues.
- The WSPU process initiated shared services for the information technology between the local municipalities and the District municipality.

5.3.1.7 Threats

- The fact that some representatives on the task team left the organisation, leaving little continuity and losing intellectual capacity.

- That external staff who are not involved in the process may conclude that the new organisational structure has been created to benefit the representatives of the WSPU task team in terms of promotion.
- If the establishment programme does not get completed the Local municipalities may distance themselves from the District.
- There is a potential for the loss of revenue to the uMDM if the transfer does not happen.
- There are different policies applied across the local municipalities and the District.
- There are different financial systems utilised throughout the uMDM.
- There are different accounting policies applied between the District and the Local Municipalities.
- There is non alignment of salary packages between the local municipalities and the district.
- If funding is not made available then the establishment will not be successful.
- There is a possibility that the uMsundusi local municipality may achieve metropolitan status and take over the WSPU function.

5.3.2. Organisational Structure

After consulting the representatives from the municipalities some minor adjustments were recommended in terms of the organisational structure and proposals made on when staff will be required. The summary of the results of all this engagement and taking cognisance of the comments made by the interviewee's are as follows in Table 27.

TABLE 27: FINAL PROPOSAL FOR THE STAFFING REQUIREMENTS OF THE WSPU

SUMMARY OF THE FINDINGS OF THE COMPARISON BETWEEN THE CURRENT AND THE PROPOSED ORGANISATIONAL STRUCTURES					
WATER SERVICES PROVISION UNIT, BUSINESS UNITS	No. OF POSTS REQUIRED	POST AVAILABLE AND OCCUPIED	POST TO BE CREATED	CRITICAL POSTS REQUIRED	POSTS REQUIRED IN SHORT TERM
UMSHWATHI MUNICIPAL AREA	111	40	71	21	50
UMNGENI MUNICIPAL AREA	70	22	48	17	31
MPOFANA MUNICIPAL AREA	57	23	34	14	20
IMPENDLE MUNICIPAL AREA	49	7	42	13	29
MKHAMBATHINI MUNICIPAL AREA	74	29	45	9	36
RICHMOND MUNICIPAL AREA	68	33	35	12	23
UMDM HEAD OFFICE	56	20	36	30	6
TOTALS	485	174	311	116	195
PERCENTAGE OF REQUIRED POST	100%	36%	64%	24%	40%

5.3.3 Telemetry System

From the investigations into the telemetry systems utilised by different local municipalities including other district municipalities it became obvious that the utilisation thereof assists greatly in the management of the water services provision.

It is fortunate in a way that the uMDM do not have many telemetry systems in operation as they are now able to install a system that will take advantage of new technology and not have to stay with technology that already exists due to the initial high costs of establishing such a provision.

All the municipalities outside of the uMDM that were investigated currently have telemetry systems that were installed a long time ago and therefore have the radio frequency type systems. These systems have a high initial capital outlay and after spending so much on the initial establishment, these municipalities are reluctant to start with new technology, although there seems to be a start to think along these lines.

The new telemetry technology makes use of cellular phone technology, which is less expensive to establish, the sender units are smaller and can be concealed much easier making it easier to prevent the vandalism of the units which was established as a real problem in the rural areas of the municipalities investigated.

There are some telemetry systems in operation within the local municipalities of the uMDM and all the three systems were utilised namely the Radio Frequency (RF) system, a Global System for Mobile Communications (GSM) system, and a General Packet Radio Service (GPRS) system. All these three systems are required for various applications, however the RF system is only to be utilised where cellular phone reception is not available, and this will be linked to a cellular phone technology system that will be located within the cellular technology reception area and as close as possible to the RF sender unit location.

The costs for the provision of the telemetry system are as provided in Chapter five of this dissertation. Depending on the availability of funds, the system can be purchased outright, or leased over a time period after which it becomes the property of the uMDM. In the latter option the service provider provides support over the time period and basically provides the capital for the establishment, charging interest for the provision thereof.

5.3.4 Operations reporting system

As mentioned previously eThekweni Water kindly provided the uMDM with their operations reporting system, known as the “Faultman” system. It was necessary to perform an analysis on the feasibility of acquiring the system, which has been provided elsewhere in this report. The results of the “TELOS” feasibility analysis were as follows:

TABLE 28: “TELOS” FEASIBILITY ANALYSIS RESULTS FOR THE ACQUISITION OF THE “FAULTMAN” OPERATIONS REPORTING SYSTEM.

TELOS FEASIBILITY FACTORS

CATEGORY	Score
Technical feasibility	7.5
Economic feasibility	7.5
Legal feasibility	8
Operational feasibility	8.5
Schedule feasibility	10
Final Score (Out of 10)	8.3

Rating Scale:		
0	5	10
Not feasible	Moderately Feasible	Totally Feasible

From the above result of the “TELOS” feasibility analysis, which analysed the technical, economical, legal, operational and scheduled feasibility resulted in a 83% feasibility for the acquisition and adoption of the system by the uMDM. It is possible that the uMDM may further customise the system at a later stage to refine the application and make it more compatible as experience and utilisation with the system will dictate.

5.3.5 “SWOT” Analysis on the uMgungundlovu District Municipality

The “SWOT” analysis was performed on the uMDM’s organisational resources and in terms of its strengths and weaknesses and its external opportunities and threats. This analysis utilised all the previous analysis’s performed throughout this report.

The framework referred to, as a structure in which to perform the “SWOT” analysis has been extracted from (Thompson Jr, A (2003), p.121).

5.3.4.1.Strengths:

A strength is an advantageous characteristic that gives the organisation competitive

advantage. There are some forms of strengths identified as follows:

Valuable human assets and important expertise

There are employees that have been working in the LM's for a long time and who know the operations environment and infrastructure very well in their areas. Some of the LM's have talented and motivated staff who under challenging conditions produce acceptable results. There has been much collective learning that has been developed over time. The managers employed in some of the municipalities are skilled and experienced and have managerial know how.

Valuable physical assets

There are some water and sanitation treatment plants that have just been upgraded and are in a good state with another sewerage treatment plant that is in good functional condition. Some of the LM's have installed telemetry systems in the urban areas although this is limited.

Financial capabilities

The uMDM is seen as a well financially resourced district municipality with good buying good will and buying power. The uMDM is in a strong financial position and has the financial resources to establish and provide the resources and infrastructure required by the water services provision function, and grow the business.

Competitive capabilities

The uMDM has strong partnerships and relationships with suppliers in the operations and maintenance field. Although the uMDM does not have sufficient numbers of staff currently employed, the staff that are currently employed are sufficiently trained employees.

The uMDM area has an adequate raw water system and potable water supply network, a wonderful climate, access to ports in neighbouring municipalities, an excellent transport system, low energy costs and sufficient human resources to encourage investment and

development in its area.

An attribute that puts the company in a position of market advantage.

The organisation has a strong name recognition in the area that it serves. The area has a wide geographical coverage which gives the opportunity for increased economic development and utilisation of economies of scale.

5.3.4.2. Weaknesses and resource deficiencies:

Weaknesses are aspects that the organisation lacks or is not able to perform adequately. Some weaknesses are as identified below:

Deficiencies in competitively important skills

There is a lack in the number of personnel employed for the performance of the water services provision function.

Lack of competitively important physical, organisational, or intangible assets.

The uMDM currently do not have premises out in the local municipalities to set up infrastructure for the provision of the water provision function. There is currently no appropriate organisational structure, infrastructure, plant, materials and equipment to be able to perform the water provision function.

Missing or weak competitive capabilities in key areas.

Although the organisation has the financial muscle it has not allocated sufficient funds to the core function of water services provision. The municipalities from which the water services provision is to be transferred have high debt associated to this provision. There is a lack in the management depth and the provision of plant and equipment relative to leading rivals for the provision of this service. The efficiency of the supply chain function within the uMDM is poor and is a great concern in the proper functioning of the water services provision unit. The attraction of consumers into the area is not as good as the rivals for the provision of water and sanitation services and hence the increase in the customer base. The high salary levels are a competitive weakness in terms of trying to

achieve a low cost of service, which will be difficult to address in the government institutional environment.

5.3.4.3. Opportunities

It is the opportunities that shape the companies strategies and in terms of the uMDM there is the possibility of performing the water services provision function using an internal mechanism. In the case of the provision of water services the focus is not on profitable growth but on improved customer services and in particular to enable improved provision of water services to the historically disadvantaged customer.

Opportunities exist in terms of geographical area, availability of water, low energy costs, sufficient low skilled human resources to encourage economic investment into the area and increase the customer base.

The uMDM has proposed the installation of state of the art e-commerce technologies and other information technologies which will ultimately reduce costs and create a competitive advantage. As the uMDM do not have information technologies they are able to procure the latest technology which has improved functionality.

The uMDM are currently aligning their organisational structure to best provide customer service and there is an opportunity for the uMDM to attain metropolitan status and take over the customer base of the rival municipality which should reduce the cost of water service per consumer.

5.3.4.4. Threats to the organisation

There are often factors in the organisations external environment that pose threats to the profitability or in this case the existence of the organisation.

Emergence of cheaper or better technologies.

Although the uMDM is in the process of installing new technology there could always be other technologies that are introduced at a later stage that could be superior to that as

proposed for installation by the uMDM.

The competition from rivals

There is competition from rivals who can provide an improved service at a lower cost. It is necessary to identify the threats to the company and to evaluate what strategic actions can be taken to neutralise their impact.

Statutory requirements

The requirement to provide free basic services has a impact of the financial resources of the uMDM and the culture of ownership and conservation of water by the consumers.

The regulations referred to previously in this paper are also onerous, which required that improved systems be installed to ensure compliance. Even with these provisions it will prove difficult to always meet these requirements.

Unfavourable demographics shift

There is a tendency for the demographics shift towards the urbanised areas of the rival organisations, which reduces the customer base and economies of scale, and increases the threat of survival of the uMDM that provide services to the rural areas.

Political Environment

Due to the political environment, which dictates to the administration on service delivery, it could be decided that the rival municipality attain the metropolitan status. As a result the vision and mission of the uMDM in terms of the water services function will not be attained but give way to the rival municipality who will provide this provision function.

There is a tendency for the political environment to focus on capital projects and the funding thereof rather than providing funding for the operation and maintenance of existing infrastructure, which is a major threat to the viability of the internal provision mechanism as proposed by the uMDM.

Potential of a takeover

There is a potential for the rival municipality, whose intention it is to also become the metropolitan area, to take over the water service provision function.

CHAPTER SIX

6 CONCLUSIONS

In this chapter the researcher discussed the findings of the research in relation to the theory that was provided in chapter 2 and 3 and as analysed and structured in chapter 4. By way of discussion, the researcher justifies why and how such conclusions were arrived at. The chapter has been structure in terms of the objectives that were set out to be achieved in the initiation of this research.

6.1 INVESTIGATIONS OF THE THEORETICAL AND CONTEXTUAL PRINCIPLES ON WHICH TO DEVELOP A MODEL FRAMEWORK IN TERMS OF THE ORGANISATIONAL STRUCTURE AND THE TECHNICAL OPERATIONAL SYSTEMS.

From the analysis of the theoretical literature review and the contextual literature review as provided in chapter two and three of this report, the relevant principles on which to base the model framework were extracted as provided in section 5.1 of chapter five in this report.

In terms of the organizational structure, 27 principles were extracted from the theoretical literature review and 5 points were sourced from the contextual literature review, which can be found in section 5.1.1.1, and 5.1.1.2 respectively.

The same exercise was performed for the technical operational systems proposed for the water and sanitation operations and maintenance function. From this exercise 28 principles were extracted from the theoretical literature review and 18 points were sourced from the contextual literature review, which included for legislation, the physical water and sanitation assets, the proposed Telemetry system, operations reporting system and the IT Network requirements. These principles and points can be found in section 5.1.2.1, and 5.1.2.2 respectively.

All the principles were considered in the development of the model framework for the organizational structure and technical operational systems.

6.2 DEVELOPMENT OF A MODEL ORGANISATIONAL STRUCTURE AND TECHNICAL SYSTEMS TO BE ADOPTED FOR THE WATER SERVICES PROVISION UNIT.

6.2.1 Organisational structure

From the principles as referred to in 6.1 above, model organizational structures were developed as has been illustrated in the organisational structures, as detailed in figures, 12 to 18 in Appendix B. The numbers of personnel required per functional position and per Local Municipality were also developed and are provided in Appendix D. These model organizational structures and associated staff numbers were utilized as a framework for further discussion and modification where required, after the reassessment thereof with representatives from the Local municipalities and other appropriate representatives.

Each principle as provided in the body of the report as referred to above was assigned a number for which will be referred to in the following discussion of the findings in relation to the theory. The first principle that was referred to in section 5.1.1 was that the restructuring of the current staff structures must be to enable improved customer service. This principle was referred to by a number of following principles i.e. principle 4 that emphasised the importance of locating units closer to where the customer is located and principle 13 and 14 where it is stated that managements focus must be placed on customer service. To be able to locate oneself closer to the customer the proposed structure provided for decentralized business units or depots with staff allocated to these locations, which supported principle number 5 as provided. This further assists with quicker decision making as long as authority is delegated to where the work is done as highlighted in principle 3. Principle 9 supports decentralisation by opposing the hierarchical model structure and little delegation of authority, which is supported by principle 26 that encourages effective lines of communication that is not only downward but in all directions.

At a glance the application of the above principles may have seemed to be creating chaos however with today's technology one is able to work reasonably effectively with such an arrangement as referred to in principle 22. The use of technology, as proposed, encourages vertical integration, facilitating both centralisation and decentralisation and enabling the transfer of middle management to other positions as the middle management tier could be dispensed with as referred to in principle 21. The costs for establishing the required technology is justified and stated in principle 20. The technology aspects are as discussed further under the evaluation of the technical systems that will follow.

Many of the principles support the change of a hierarchical structure into a more flattened structure, which encourages creativity, flexible supervision and the requirement to multi-skill employees as advocated by principles 6 and 2. An attempt was made to flatten the structure as much as possible in the framework model, which encouraged many revisions of the initial proposed structure. As stated in the text and referred to in principle 16 the span of control should not be too narrow or too wide. It is stated in the text that spans of between 10 and 20 workers could be achieved in a reengineered organisation however in the current environment this was seen to be excessive and reduced to more practical limits. The one position for which the span of control could further be extended is that of the superintendent position as allocated to two positions in each business unit. As referred to in principle 27, it was intended to provide for an appropriately populated structure that will cater for the next five years. There would not be a need to fill this post immediately and it should remain vacant until the time arises. With the rapid development and implementation of water and sanitation infrastructure in the uMDM rural areas it was envisaged that this post would be required within the next five years.

In reviewing the contextual literature it was apparent that the local municipalities did not have sufficient human resources and by meeting the requirements in the opinion of the researcher, it was necessary to increase the staff complement dramatically. All attempts have been made to limit the increase in personnel and a modest approach was adopted following the 8th principle of rather underestimating the staff complement required. As

this operations and maintenance provision function is a 24 hour operation it was necessary to ensure minimal staffing requirements to cater for this and the possibility of personnel falling ill and taking sick leave being taken into account.

The researcher was very aware of the principal number 15 and 23 as in this environment there is a vital need to motivate the employees. The existing staff have been waiting for a number of years to see the finalisation of their transfer to a new structure and are currently demotivated. The whole work ethic has deteriorated and measures are proposed to be instituted to change the current organisational culture, as alluded to in principle 19, especially amongst the lower ranked employees. The new structure has attempted to remedy the situation and provides for the establishment of teams within and between business units that will be utilised to develop competitiveness and lead to motivating the staff. Career paths were provided for the promotion from junior to senior positions, and with skilling the promotion of general workers will be encouraged.

All attempts were made to reduce the interface between departments within the organisation by creating an independent department that would be responsible for all water and sanitation provision. It however proved difficult to totally ring-fence the function as the Financial Services Department rejected the proposal. As shown in the organisational structure all issues relating to financial services namely the revenue collection, meter reading, buying and inventory control report directly to the financial services department.

In terms of the second section 84(3) notice, and in terms of the municipal structures act, No. 117 of 1998, the uMDM was required to assume the WSA function and therefore be responsible for the policy and enforcement role for the water and sanitation provision in its area. It was further acknowledged that the uMDM has in terms of section 78(2)(a) of the municipal systems act No. 32 of 2000, opted to provide municipal services in its area utilising an internal mechanism and therefore will be providing both the policy and enforcement role, and the water services provision functions as the WSA.

It is a requirement in terms of Section 20 (1) of the Water Services Act No. 108 of 1997, and as provided in the contextual literature review, that when the WSA is performing the function of, (a) a water services provider; and (b) policy development and the enforcement thereof, the water services authority, that is the uMDM, must manage and account separately for those functions. From the above extract it was clear that the current WSA component cannot both manage the water services provision for the uMDM and govern its operations in terms of legislation. This separation of functions has forced the allocation of the post of Executive Manager: Policy and Enforcement, outside of the new proposed water services department, reporting to the SEM Professional Support Services and transformation position as indicated in the proposed organisational structure as shown in Appendix B as Fig.12.

As has been stated above and provided in the organizational structure, a new water services department was proposed for the uMDM that is responsible for all water and sanitation provision issues. There are various reasons for this in addition to what has already been discussed.

The main motivating factor was that water services is the most critical service provision function of the uMDM and deserves to receive priority in decision making at Strategic Executive Manager (SEM) level. The second motivating factor was that its staff complement is almost the size of the current organisation and will be doubling the organisational size. The third motivating factor was as highlighted in principle 24 and 25 that emphasises the interaction that is required by way of networking with municipal managers of local municipalities and other high ranking officials from other institutions. This would have to be facilitated and engaged by a highly positioned official of the uMDM, preferably at a SEM level, which further justified the requirement.

This concludes the discussion of the findings in relation to the theory for the organisational framework model which was developed. As mentioned previously this structure was developed for comparison with the current organisational structures and to determine the gap in terms of staffing requirements that are to be filled to effectively meet

the expectations of the customer in terms of service delivery.

6.2.2 Technical Operational Systems.

In consideration of the summary of principles and contextual points as referred to in 6.1 above, the proposed model framework for information technology systems for the uMDM are highlighted and explained below.

In terms of good engineering skills it was important to focus on what the process should be doing rather than on how the process should work. This was referred to in principle 8 and assisted with keeping the design team focused on what needed to be addressed by using information and technology jointly to meet the requirement.

The requirements of the proposed WSPU establishment are the regulations as referred to in the contextual points 1 and 2, and to be able to comply with these regulations one will have to possess an excellent system for reporting by the public, interaction with the workforce and reporting on the operations of the infrastructure. It is obvious that the regulations are promulgated so as to ensure good service delivery to the customer.

In this transition of the responsibility of the function of water services provision it was important to ensure that the service provision currently enjoyed by the customer must either remain unchanged or improved. The needs of the customer and an increase in the value provided are to be met. Principle 2 stressed that the uMDM must focus on the value to be provided and not the cost to be able to provide a suitable system. Of course cognizance must be taken of cost but not to the detriment of customer service.

The utilisation of technology is necessary to aid the successful adherence to the requirements. It provides a platform of systems and capabilities that new working practices can be based on and allows new systems to be put in place. The use of technology in the redesign of business processes enables improved quality, speed and flexibility to be achieved in the new processes adopted. It was important not just to automate the old ways of doing things but to look for better ways of defining, organising

and running an operation. It was however realised that technology is not necessary the ultimate solution and one must not succumb too easily to its seduction.

The relationships and interaction between the social and technical elements of the processes needed to be analysed and understood, which formed the basis of the process to be adopted and it was in the best interests of the organisation to appoint external specialists with the required skill to assist in the process, especially as the organisation did not have the necessary in-house expertise. These specialists came with an external view, not knowing the workings of the internal processes and were uninfluenced by a possible bias towards a system that may want to be kept because everyone knows how to use it and who are reluctant to change (principle 12,13 & 14).

There is a strong move towards the creation of a “boundaryless” or “seamless” interface between traditional functions where disruptions will be reduced and communication and cross-functional coordination between personnel and systems will be improved. Principle 11, 3, 16, and 22 refer to the requirement for systems to be able to interface with one another and other corporate systems. The way in which the uMDM has attempted to encourage this interface was to propose the utilisation of a common data base with a flexible report writing program as stated in principle 23 and 24, which facilitates common understanding in decision making.

The principle 18 was critical in the establishment of the WSPU as it demanded that the operational reporting system must match the organisational structure and its physical operation. The systems adopted were adopted with this in mind as a priority factor.

It was important to assess the organisational operations environment in terms of its spatial representation. As explained in the contextual review items 3 to 9, there are many water and sanitation schemes that will have to be operated and maintained with more than half of the schemes located in the rural areas that are a fair distance from any decentralised office and depot, as has been proposed.

All the urban / peri urban water schemes and a small percentage of the schemes in the rural areas have high level of service, bulk water supplies, providing the distribution networks, which should be maintained by well qualified artisans. As a result of the minimum provision of personnel to operate the water infrastructure the staff will be located at the decentralised depots / business units, which are still a fair distance from most of the schemes. This calls for a system to facilitate the quick dissemination of information to minimise the response time, to resolving any malfunction or operational failure in the provision of the water services.

6.2.3.1 Telemetry information technology system

In the operational context it is common for pipeline bursts or other water pressure failures to occur in the middle of the night when there is no consumption occurring. With most consumers asleep at this time, the possibility of any incidents of no water supply being reported is minimal, and is often only reported when everyone wakes up and finds they have no water to wash or bath with. There are other examples of the consumers not reporting malfunctioning of the water supply system which will not be discussed; needless to say that one can not always rely on the human factor in the reporting of issues that need to be rectified. As a result of this and as customer service is our prominent concern, the installation of a information reporting system viz. a telemetry system, was proposed for the monitoring of the water and sanitation infrastructure, often assisting to rectify any problem that may occur before it even starts affecting the consumers.

As provided in item 10 of the contextual review, there are three telemetry systems that are proposed for installation throughout the uMDM namely the Radio Frequency (RF) system, a Global System for Mobile Communications (GSM) system, and a General Packet Radio Service (GPRS) system. All these three systems are required for various applications and circumstances. These systems will send information to a central receiving unit that will in tern be interpreted by a SCADA package that will assist the operator in interpreting the information. It is proposed that the control of the system will be performed from one computer, which will be password protected. The information will be relayed through to computers that will be located at each decentralised business unit and water office with

viewing capability only. At the touch of a button the managers at the decentralised offices will know at all times the status of the key water services infrastructure.

The benefit of this system is that information is made available to all key personnel and that the information received is common to all who will be viewing at any time. This assists in joint decision making from personnel who are geographically separated and provides continuous feed back on any actions taken to correct any problems on the water infrastructure. Personnel will be able to ascertain what the problem is that is causing the issue before even driving out to the area and will know what has to be performed to sort out the problem. In some instances it may not even be necessary to travel out to the water scheme as the problem can be rectified from the controls station by sending instructions to the infrastructure from the central computer. As can be appreciated, the installation of such a system will assist immensely with meeting the requirements of legislation. To the advantage of the WSPU and as was mentioned in the contextual review, some of the local municipalities already have some telemetry installed on some water infrastructure. This reduces the cost of having to provide the technology in these areas and would simply mean rerouting the messages to a different destination to incorporate the existing systems into the proposed centralised system.

As also mentioned previously, it is the intention of the uMDM to establish a VPN that will link all the decentralised water offices and depots. This proposed network facility facilitates the transfer of information from the centralised control station to these decentralised locations, and ensures a more than 98% up time.

6.3.2.2 Operations reporting, information technology system

The other “informate” system proposed for the WSPU is that of the operations reporting system. This system is critical for addressing all the principles extracted from the literature review. As with the telemetry system this system will be utilising the VPN, which has adequate bandwidth enabling quick transfer of information and almost real time communication depending on what level of service is opted by the uMDM. This system is designed to cater for the consumer and meet the requirements as referred to in point 2(d)

of the summarized principles. It further caters for an audit trail of all activities, providing information for the monitoring of all operational procedures, the writing of reports, the analysis of trends as alluded to in principle 20 and caters for feedback to all employees who are performing the work, indicating the time taken to perform the work, how many jobs were performed etc., following the systems approach as referred to in principle 17. As referred to in principle 21, the system uses a SQL server as a database platform, which makes it easy intergratable into other management systems that are proposed for the uMDM. It is further available to any key personnel who would require it, which facilitates cross functional and department communication and coordination. In the uMDM's case it will be utilised by other departments i.e. the disaster management and fire services departments, which will further assist in reducing the duplication of staff required to operate the system as all the three functions will be utilising one system.

As referred to in principle 26 and 27 it was necessary for the organisation to decide whether to procure a system off the shelf, by integrating off-the-shelf components or to develop a custom solution to suit the environment. Should one procure an off the shelf solution one will have to investigate as to what is commercially available, talk to vendors and receive demonstrations, but only after the initial investigation of other organisations that one would benchmark oneself against, so as to make an informed analysis of all the available products. In the case of the uMDM and thanks to the Head of eThekweni Water, assistance was provided by giving their operations reporting system to the uMDM for utilisation, namely the "Faultman" operational system which they developed in-house for their operations function.

The receipt of the "Faultman" operating system may be interpreted in this investigation as being procured off the shelf but with very little additional functionality required or need to customise it as it has been in operation for over 10 years and is still regarded as comparable to the latest similar software.

In terms of principle 19 the system is not restricted to variations in the size of the area for which it will be utilised, however the system code is not available which means that no

additions to the program can be made. For any further customisation of the system it will be necessary to provide a front-end transparency on a dot.net platform which will enable additions and further improvements on the system possible while still keeping the core functionality of the program intact.

This concludes the discussion on the analysis of the findings in relation to the literature review in order to develop model frameworks. In the above analysis the telemetry system and of the “Faultman” operational reporting system as proposed for the adoption by the uMDM for the WSPU was provided. An understanding was further provided as to what information technology network system has been proposed for the uMDM.

6.2.3 Adoption of the Wide Area Network for the uMDM

Following from the investigations that have been performed it was concluded that due to the changes in the sphere of government and especially as the uMDM is forced to review its long term information and communication technology (ITC) strategies to accommodate the new technological demands, it will have to provide an IT infrastructure that will be able to successfully cater for this. One of the major challenges is having to gear oneself for e-governance compliance and sharing its resources with the local municipalities.

As a result of these challenges there is a need for the uMDM to invest in the establishment of a wide area network that will be utilised by the many functions of the uMDM including the functions that are related to the proposed WSPU, namely the customer call centre, the operations reporting system, the telemetry system and water payment offices etc.

It is concluded that due to the requirement of a high level of security that the uMDM should adopt the option of providing a direct link to a VPN. This can be utilised further for connections to area private networks which will further allow the secure use of wireless technologies that may be required.

6.3 VERIFICATION AND MODIFICATION OF THE PROPOSED ORGANIZATIONAL STRUCTURE AND TECHNICAL OPERATING SYSTEMS.

As the framework model for the organizational structure and technical operational systems had been developed from the literature reviews, it was necessary to test the models that had been developed by interviewing experienced personnel that had been working in the areas and on the infrastructure that the water services provision business unit was being developed for.

From the questionnaire it was possible to solicit comments that assisted in making amendments to the proposed organizational structure framework. The results of interviews provided a slightly modified organizational structure in terms of the number of posts and the number of personnel required per functional position.

As commented on by various representatives who were interviewed, the following was agreed to by the researcher and therefore he has decided to make the following revisions to the model framework as initially developed where applicable:

- 6.3.1** In some cases it may not be advisable to define the rural and urban / peri-urban components of the organisational structure as separate entities. This was supported by the literature review in increasing the span of control and flattening the organizational structure;
- 6.3.2** It was believed that there should not be a distinct separation between the water and sanitation reticulation functions, but that they should be merged and represented as one function. This aspect was also supported by the literature review in allowing for an increased span of control and flattening of the organizational structure. It further provided for flexibility and multiskilling, which allowed for a reduction in the number of personnel required, ease for job allocation and a motivational principle in terms of providing the employee with more skill and a variation of the work to be performed;
- 6.3.3** It was believed that not sufficient number of Institutional Social Development offices and administration support official existed in the structure and that a

financial controller is required. It was agreed that there would be a large amount of administration that would have to be performed in the professional bureaucracy configuration where there is generally a shortage of resource availability;

6.3.4 There was agreement in the change in the numbers of staff that were required, some increase and some decrease in the numbers of staff. This was agreed to in terms of the operational environment as discussed and solicited by way of the interviews with the personnel that work in the environment.

The revised staffing numbers and proposed organisational structures are as provided in Appendix G of this report.

In terms of the technical operational information systems, the researcher received full support with the systems identified as opportunities that scored on average 9.8 out of 10 for its acceptance.

6.4 REVISIONS OF THE COST ANALYSIS AND THE ESTIMATED WATER TARIFF

As there were no significant changes in the administration costs the parameter utilised for the cost analysis were unchanged and remain as provided in Table's 23 and 24 of this report.

There is a substantial amount of capital expenditure that will be required in the initial establishment of the WSPU, in the order of R31,5 million. It is required that the uMDM source a loan for these costs and repay the loan from revenue received from water consumption charges.

To be able to provide an affordable service to the consumer it is required that 45% of the entire equitable share allocation be allocated to the water and sanitation provision in the immediate term and this must be increased to 52% when the entire uMDM has been serviced with water and sanitation infrastructure.

It is estimated that when utilising the revised parameters as provided in Table 20 that the flat rate for water consumption will be R7,55 per kilolitre in the immediate term and the increase to R7,80 per kilolitre in the future to cater for the provision to the entire uMDM population, which is in the opinion of the researcher acceptable. These tariffs provide for unaccounted for water provisions that are normal for the rural and urban environments, which is expected to be reduced, and which will therefore reduce the costs for the provision of the service. With good social interventions it will also be expected that the payment for water will be improved in the future, which will also improve the financial situation.

Further calculations can be performed to change the flat tariff as provided above into a block tariff system and the time period within which the new tariff is to be phase in will have to be determined. This can be performed at a later stage by another or the same researcher.

The success of the establishment of the WSPU depends on the availability of funds and the allocation of a large portion of the equitable share to this service provision. It is estimated that approximately R60 million of the equitable share is required immediately for allocation to the water and sanitation function. This should comprise approximately of the total services component and an additional R21 million from the levy replacement grant component of the 2006/07 financial year. The Equitable Share allocations are as previously provided in Table 6, in the contextual literature review.

The calculation assuming that the entire uMDM is serviced indicates that approximately R70 million of the Equitable Share is required for allocation to the water and sanitation function. More of the levy replacement grant should be allocated to the water and sanitation provision function in this case.

A summary of the financial calculation for the current and the future situation is as provided in Table 29 below:

TABLE 29: SUMMARY OF THE FINANCIAL CONSIDERATION

Local Municipality	TOTAL (CURRENT)	TOTAL (FUTURE)
Cost of bulk water	R 18,306,553.64	R 20,000,473.57
Cost of unaccounted for water not sourced from bulk supplier	R 13,890,196	R 16,042,366
Water Supply O & M	R 26,085,827.09	R 32,461,561.80
Sanitation O & M	R 19,839,510.16	R 19,839,510.16
Total cost of services	R 91,865,458.76	R 102,087,283.71
Total income (No free basic water).	R 42,538,612.38	R 44,085,642.40
Balance (No free basic water)	R-49,326,846.37	R-58,001,641.31
Total income (With free basic water).	R 31,500,731.02	R 32,682,268.27
Balance (With free basic water)	R-60,364,727.74	R-69,405,015.43
Total volume of sales	4,172,282.25 Kl	4,190,034.39 Kl
Equitable Share allocation (52%)	R 60,354,450.00	R 69,528,326.40
Unified Water Tariff (R/Kl)	R 7.55	R 7.80

6.5 CRITICAL FACTORS TO BE TAKEN INTO CONSIDERATION WHEN ESTABLISHING SIMILAR WATER SERVICES PROVISION UNITS.

From the interviews that were held with the members of the WSPU reengineering task team a number of challenges, strengths, weaknesses, opportunities and threats were identified. From these comments a number of critical factors were extracted that have to be considered in the reengineering process.

These factors as provided below are to be addressed in any similar reengineering process as follows:

- 6.5.1** It is required that political buy in is obtained for the reengineering process at the outset. Consensus must be received from the executives of the organisation before any WSPU establishment can be initiated.
- 6.5.2** When one develops a programme it must be designed with appropriate time lines, preferably within twelve months.

- 6.5.3** The top management of the organisation must demonstrate their support and own the process. It is vital that the whole process of the establishment of the internal WSPU be owned by the executive members (Political representatives) and the Executive Managers (Top Management) for the smooth committed rollout of the implementation process.
- 6.5.4** It is considered imperative that a sub committee of the executive structures be formed and assigned for the oversight of the development. This smaller representative sub committee will be easier to work with and to call together when required so as to approve decisions for forwarding to the Executive Council structure and to assist with knowledge transfer and the efficient establishment process.
- 6.5.5** The process must be budgeted for, before the establishment process is embarked upon and full commitment received from the financial services department and council on this matter.
- 6.5.6** The reengineering team must be well represented by all departments and affected stakeholders. Union representation is essential.
- 6.5.7** There should be backup staff available, whom are aware of the progress that is being made and who can substitute a member of his/her department who may become unable to continue with the process.
- 6.5.8** A strong facilitator is required to facilitate the reengineering team, one who can lead and follow.
- 6.5.9** Communication with stakeholders is essential. As the establishment process involves a number of other parastatal organisations it is vital that all the role players be brought on board and frequent communication be engaged so as to ensure that all representatives are and feel part of the transformation process
- 6.5.10** Regular meetings between the representatives of the reengineering team are required where feedback and new direction can be given.
- 6.5.11** On average the team must jointly spend more than 50% of their employment time on the programme, with at least one fully committed employee.
- 6.5.12** The team members should communicate with service providers and other organisations that have performed similar operations and who have the technical know-how.
- 6.5.13** The team representatives must focus on achieving the high priority tasks that are on the programme and continually be guided by this establishment programme to complete all the tasks that are provided for.

CHAPTER SEVEN

7 RECOMMENDATIONS

7.1 ORGANISATIONAL STRUCTURE

As stated in the contextual literature review, “the vision of the uMDM is that it will evolve into a dynamic Metropolitan area, spreading its vibrant economic benefits to all its citizens and places and will, through concerted integrated development and service delivery, realise improvements in the overall quality of life” (uMDM IDP, p.29). This vision steered the development of an organisational structure in the direction of a metropolitan structure where the internal mechanism with centralized control of decentralised business units / offices was aspired to. It was ascertained through the theoretical literature review that the initial organisational structure configuration that the operational WSPU would adopt would be the machine bureaucracy (Robins. P.115) and with increase in size in the future it may change to the configuration of a divisional structure (Robins, p116).

In the development of the organisational structure it is recommended that the form of the machine bureaucracy be initially utilized and that a department within the uMDM be established for the provision of water and sanitation services jointly utilizing the services of departments in the organisation that were also utilized by the entire organisation. For the adoption of decentralised business units / offices it is recommended that authority be delegated to managers at the decentralised business units and where the work is performed (Anstey, p.318).

The organisational structure that is recommended for the uMDM water and sanitation services provision is that which has been developed and provided as Appendix G in this dissertation. It must be noted that this organisational structure has been proposed for the next five year term and that not all the posts are required to be filled immediately. The appointment of staff to the available posts will only be made as and when required. As stated by Manganeli (1994) it is better to underestimate the staffing complement than

overestimate it as it is difficult to resolve the underutilisation problem (Manganelli, p.171). It is therefore recommended that only those posts that are urgently required be filled in the immediate term.

It is proposed that all the staff that are currently performing the operations and maintenance function for the current water service providers within the uMDM be transferred to the new WSPU establishment. It is however recommended that the transfer of staff only be performed once the operations reporting system and other systems have been finalised and established. This is recommended as the uMDM will after the transfer of staff take the full risk of this water services provision function and they must be able to manage and control it adequately.

The table No. 27 which identifies the final proposal for staffing requirements and as previously provided indicated the following:

Local Municipality	TOTAL (CURRENT)	TOTAL (FUTURE)
Cost of bulk water	R 18,306,553.64	R 20,000,473.57
Cost of unaccounted for water not sourced from bulk supplier	R 13,890,196	R 16,042,366
Water Supply O & M	R 26,085,827.09	R 32,461,561.80
Sanitation O & M	R 19,839,510.16	R 19,839,510.16
Total cost of services	R 91,865,458.76	R 102,087,283.71
Total income (No free basic water).	R 42,538,612.38	R 44,085,642.40
Balance (No free basic water)	R-49,326,846.37	R-58,001,641.31
Total income (With free basic water).	R 31,500,731.02	R 32,682,268.27
Balance (With free basic water)	R-60,364,727.74	R-69,405,015.43
Total volume of sales	4,172,282.25 KI	4,190,034.39 KI
Equitable Share allocation (50%)	R 60,354,450.00	R 69,528,326.40
Unified Water Tariff (R/KI)	R 7.55	R 7.80

As can be seen from the above table, it is recommended that the number of posts that are to be filled immediately are 116 posts or 24% of the total staff complement required by the WSPU. It can be observed that should all the current staff be transferred to the uMDM then only 36% of the required posts will be filled, leaving 64% of the posts vacant and in need of filling over the proposed 5 year term, for which the organisational structure has been developed. It is recommended that a 40% of the total required staff complement be filled at a later date as and when required, and within the next 5 years. The reason for the additional 40% is because the uMDM have planned to construct additional infrastructure in areas where no infrastructure currently exists and this should be completed within the next 5 years. Staff will be required to operate and maintain this infrastructure.

As already mentioned it was not possible to ring-fence the operation of the WSPU from the rest of the organisation and establish a separate self sufficient entity and therefore the WSPU will have to work with other departments on which it will depend on efficient service. This requires that service level agreements need to be entered into between the relevant departments e.g. the Financial Services Department, and the proposed Water Services Department.

As has just been alluded to, it is recommended that a new water services department be established that will encompass all functions that relate to the water and sanitation services but excluding the policy and governance section who in terms of legislation have to be separated from the provision function (Republic of South Africa (1997), p.24).

7.2 TECHNICAL OPERATIONAL SYSTEMS

7.2.1 Telemetry information technology system

As recommended in the report provided by external consultants on the investigations into the information systems required by the WSPU of the uMDM, it is recommended that the uMDM must install three types of telemetry systems throughout the uMDM namely the Radio Frequency (RF) system, a Global System for Mobile Communications (GSM)

system, and a General Packet Radio Service (GPRS) system (Business Connection (2006), p.22). All these three systems are required for various applications and circumstances. It is further required that a Supervisory Control and Data Acquisition (SCADA) system be procured that will assist the operator in interpreting the information that will be received from the telemetry system (Business Connection (2006), p.8). There are a number of SCADA systems on the market as stated elsewhere in this report however the Adroit system is utilized by all the water utilities surrounding the uMDM and specifically the uMsundusi Municipality and Umgeni Water and it is therefore recommended that this system be procured. It would be wise to procure the same system if it contains all the requirements, as should the operations of the uMDM and the uMsundusi municipality merge then there would be an easier integration of systems.

The estimated capital cost for installing the telemetry system is R 3,570,000 however the system can be installed utilising a lease agreement where the uMDM could lease the system for 36 months after which it becomes the property of the uMDM. There are some capital costs associated with the leasing option as shown in Table 22 of this dissertation. Should the capital amount of R 3,570,000 not be sourced then the leasing option of R 129,564.70 per month could be opted for. One benefit of the leasing option is that the supplier will maintain the infrastructure for the first 36 months and will resolve any teething problems.

It is recommended that the three telemetry systems as referred to above and the Adroit SCADA system be procured and installed for utilisation by the WSPU following all procurement regulations. It would be very difficult to operate and manage the water and sanitation infrastructure without such systems when centralizing control as proposed and as the area of supply is wide spread and there are limited staff assigned to the operations and maintenance function.

7.2.2 Operations reporting, information technology system

As provided in the findings and the conclusion chapter, the “informate” system proposed for the WSPU is namely the “Faultman” operations reporting system as given to the uMDM by eThekweni Water.

The “Faultman” operations reporting system has a full range of capabilities which provides an interface between the work that is being performed on the ground and the management and customers who want to know for example, why they do not have a water supply and when the supply is going to be restored?; when a particular problem in the supply was reported and when it was rectified?; how long the task took to complete and how often the problem has occurred? (Republic of South Africa, (2001), Section 16).

The system further caters for an audit trail of all activities, providing information for the monitoring of all operational procedures, the writing of reports and the analysis of trends (INGENIUM, p.4.2). It further caters for feedback to all employees who are performing the work, indicating the time taken to perform the work, how many jobs were performed etc., following the systems approach (Manganelli, p.132). The system uses a SQL server as a database platform, which makes it easy intergratable into other management systems that are proposed for the uMDM.

Before it could be recommended that this system be utilised it was necessary to perform a “TELOS” feasibility analysis. As the “TELOS” analysis scored an 8,3 out of 10 as is shown in table 28, it was seen to be acceptable for the adoption by the uMDM for the operations department (Whitten (1994), p815).

After the positive feedback received from the interviewees of the “Faultman” system it was further substantiated that the system must be adopted by the uMDM and it is therefore recommended for adoption.

7.2.3 Adoption of the Wide Area Network (WAN) for the uMDM

Following from the investigations of the various WAN's it is recommended that a VPN be established for the uMDM. It must be noted that the WAN that is recommended is utilised by the entire organisation which is proposed to be linked to the local municipalities within its area and will be utilised by the emergency services section, the finance section, disaster management, the WSPU and for IT support to the Local municipalities. The WSPU will utilise the VPN for the functions namely the customer call centre and operations reporting system, the telemetry system and water payment offices.

The benefits of the VPN are again provided below for ease of reading as follows:

- There will be reduced capital expenditure (Economies of Scale);
- The alternative of private direct link networks are Expensive;
- It provides an organisation with a “Private Network” at a lower cost;
- There will be a faster Return on Investment;
- There is complete proactive network management;
- The service provider provides fault and maintenance management on all aspects of the network;
- There are guaranteed service level agreements on all aspects of the network, including Diginet access lines, Cisco routers, VPN performance and throughput;
- The service provider provides dedicated personnel to handle the rollout; installation, deployment, and all service and administrative aspects;
- There are monthly visits made by service manager to present and discuss network statistics and reports;
- There is access to Cisco certified engineers and specialists;
- The network security is derived from a VPN on a private carrier-class national IP network;
- The service provider provides management, maintenance, and configuration of all Cisco routers, both hardware and software; and

- There is the provision of secure 3G connectivity and ADSL connection from remote sites (uMDM (2005c), p3; Telkom (2006), p.7 – p.10).

It is further recommended that 64K band width lines be established between the VPN and all the Local Municipalities and the rural water offices, and that the uMDM install a line with a 128K bandwidth. These band widths as stated will be sufficient to cater for the traffic that is expected on the lines between the various municipalities.

The provision of a VPN will assist the uMDM in becoming e-governance compliant and sharing its resources with the local municipalities. The VPN can be utilised further for connections to area private networks which will further allow the secure use of wireless technologies that may be required.

7.3 FINANCIAL CONSIDERATIONS

As concluded in the previous chapter, when utilising the revised parameters provided in this report, the flat rate for water consumption was calculated to be R7,55 per kilolitre in the immediate term with the increase to R7,80 per kilolitre in the future to cater for the provision to the entire uMDM population. Both rates as stated above are calculated in present terms.

To be able to achieve these tariffs as mentioned above it would be necessary for the uMDM to allocate 45% of the entire equitable share allocation to the water and sanitation provision function in the immediate term and that this be increased to 52% when the entire uMDM has been serviced with water and sanitation infrastructure.

There is a large amount of capital expenditure required in the order of R31,5 million to initially set up the WSPU. It is recommended that these funds be sourced from loans, to be paid from the water consumption charges. The loan repayments have been included in the water tariff financial calculations.

It is recommended that the uMDM embark on an awareness campaign regarding the

conservation of water and the necessity to pay for services over and above any free allocation that may be provided. By reducing losses of water on the water reticulation systems and by receiving a better cost recovery the total tariff may be able to stay unchanged in future years and the allocation of the equitable share to this water services function may be reduced.

The success of the establishment of the WSPU depends largely on the availability of funds and the allocation of a large portion of the equitable share to this service provision. It is recommended that 45% of the entire equitable share be allocated to the water and sanitation function which may comprise of the total services component and an additional amount from the levy replacement grant component of the 2006/07 financial year. The Equitable Share allocations are as previously provided in Table 6, in the contextual literature review.

In terms of the legislative requirements of Section 79(a) of the Systems Act No. 32 of 2000, the uMDM must allocate sufficient financial resources for the proper provision of the water services (Republic of South Africa, 2000, p.74). With this legislative provision it is likely that, as the uMDM have opted to perform the water services provision function utilising the internal mechanism, they are likely to provide the required funds.

It is recommended that the WSPU monitor the financial situation and performance by utilising some indexes and ratios as previously provided in this report. The Indexes and ratio's are as following:

Indexes:

1. The number of debtors with payment in arrears (% of connections) (Correia, p.144).
2. The amount of money in arrears owed to the Municipality (Accounts receivable) (Correia, p.155).
3. Net profit percentage before tax and interest (Steyn, p.74).
4. Gross profit percentage (Steyn, p.75).

5. Administration expenses percentage (Correia, p.146).

Ratios:

1. Average Collection Period (We should strive for a 30day collection period) (Correia, p.149).
2. In terms of inventory, the stock turnover can be monitored (Correia, p.148).
3. Gross profit margin (Correia, p.152).

7.4 WSPU IMPLEMENTATION ROLLOUT PROGRAMME

It was evident that the initial time period allowed for the establishment of the WSPU was inadequate as referred to in the literature review and as commented on by the representatives of the WSPU task team.

The initial programme as provided in Appendix C, which was initially utilised as the model programme for the investigations of this dissertation has therefore been superseded by the revised rollout programme as provided in Appendix H.

It is recommended that the roll out programme as provided in Appendix H be utilised as a tool to complete the establishment of the uMDM WSPU and be utilised as a guide by other researches that are performing such an engineering exercise.

7.5 GENERAL RECOMMENDATIONS

The uMDM should further pursue the acquisition of Metropolitan status as this will further increase the customer base and with economies of scale be in a more favourable position to provide this water services provision.

It is important that the uMDM act swiftly and set up the provision unit so as not to further delay the transfer of staff which may leave and seek other employment due to the current insecure position they find themselves in.

It is further recommended that the readers of this report who wish to utilise this

dissertation and the implementation rollout programme as provided in Appendix H of this report, as a tool for the establishment of an internal mechanism for the provision of water and sanitation services, scrutinise it and make adjustments where required. This report can be utilised as a guide for a Water Services Authority who has similar geography and demographics and infrastructural development, with the possible organisational vision to attain metropolitan status.

7.6 CRITICAL FACTORS TO BE TAKEN COGNIZANCE OF WHEN PERFORMING A SIMILAR REENGINEERING PROGRAMME.

From the number of comments received from the task team representatives and as provided by the researcher, some critical factors were extracted and are provided below. It is recommended that anyone who engages in a similar reengineering exercise must take cognisance of the following critical factors as provided below.

- 7.6.1 It is required that political buy in is obtained for the reengineering process at the outset.
- 7.6.2 When one develops a programme it must be designed with appropriate time lines, preferably within twelve months.
- 7.6.3 The top management of the organisation must demonstrate their support and own the process.
- 7.6.4 It is considered imperative that a sub committee of the executive structures be formed and assigned for the oversight of the development.
- 7.6.5 The process must be budgeted for, before the establishment process is embarked upon and full commitment received from the financial services department and council on this matter.
- 7.6.6 The reengineering team must be well represented by all departments and affected stakeholders. Union representation is essential.
- 7.6.7 There should be backup staff available, who are aware of the progress that is being made and who can substitute a member of his/her department who may become unable to continue with the process.

- 7.6.8 A strong facilitator is required to facilitate the reengineering team, one who can lead and follow.
- 7.6.9 Communication with stakeholders is essential.
- 7.6.10 Regular meetings between the representatives of the reengineering team are required where feedback and new direction can be given.
- 7.6.11 On average the team must jointly spend more than 50% of their employment time on the programme, with at least one fully committed employee.
- 7.6.12 The team members should communicate with service providers and other organisations that have performed similar operations and who have the technical know-how.
- 7.6.13 The team representatives must focus on achieving the high priority tasks that are on the programme and continually be guided by this establishment programme to complete all the tasks that are provided for.

7.7 OVERVIEW OF THE ABOVE RECOMMENDATIONS

An overview of the above recommendations required for action for the successful establishment and operation of the WSPU by the uMDM are that the uMDM must:

- approve the Water Services organisational structure as provided in Appendix G of this dissertation;
- provide the required resources in terms of suitably qualified personnel appointed to the posts as provided in Appendix G as recommended above;
- only transfer the staff that are working for the current WSP's, on water and sanitation infrastructure, once the operational systems have been installed and the organisational structure has been adopted;
- Ensure that authority is decentralised to where the work is performed at decentralised business units;
- Establish Service Level Agreements between the WSPU and other departments namely the Financial Services Department, WSA section and other departments;
- provide the information technology infrastructure, information and operational systems as concluded in terms of the recommendations of this report;

- commit the required amount of the Equitable Share, which from the calculations in this report amounted to approximately 45% of the entire equitable share or approximately R60 million per annum, to the water services provision function;
- monitor the financial situation and performance of the WSPU utilising the indices and financial ratio's as provided in the above recommendations;
- abide to the legislative requirements of Section 79(a) of the Systems Act No. 32 of 2000. that states that if a municipality decides to provide a municipal service through an internal mechanism mentioned in section 76(a), it must a) allocate sufficient human, financial and other resources necessary for the proper provision of the service; and b) transform the provision of that service in accordance with the requirements of this Act (Republic of South Africa, 2000, p.74).
- pursue the proclamation of Metropolitan status and take advantage of the increase in the revenue base and economies of scale;
- strive to complete the reengineering process as quickly as possible;
- utilise this dissertation and the rollout programme as provided in Appendix H as a guide for the WSPU establishment;
- ensure that cognisance is taken of the critical factors as provided in the recommendations and that they are followed.

It is further recommended that should another WSA want to utilise this dissertation and the rollout programme as provided in Appendix H as a guide for a reengineering exercise that they are performing then they must acknowledge the environment and the vision in which this dissertation was developed and make modifications where appropriate to suit their own environment. This dissertation must not be seen as a general guide to be followed in all environments.

7.8 RESEARCH LIMITATIONS

The research was limited to the establishment of a water services provision unit in terms of its organisational structure, information technology systems, the estimation into the costs for the establishment of the WSPU and its affect on the water tariff for the uMDM.

The research area was confined to that of the uMgungundlovu District Municipality and the local municipalities within its jurisdiction although comment on the investigation was received from one district municipality that has a similar demographics profile and infrastructural environment.

The initial intention was to interview WSA managers from other district municipalities but unfortunately due to the tight programme that the researcher was working to and to some small degree, the delay in receiving a response from the Ethical clearance committee of the University of KwaZulu Natal , time did not allow for this additional research, which is considered as a valuable exercise.

There is currently a draft regulation that requires the registration of waterworks and process controllers, which specify the number of personnel one is required to have assigned to a water treatment works. The existing water works will still have to be assessed and classified and possible additional operators assigned to them, which will change the number of operators as provided in the proposed organisational structure.

It is also necessary to develop job descriptions for each of the posts identified in the organisational structure which has not been formally developed although mentally conceived to justify the positions as provided for. This is required so as to finally confirm the validity of each post and should be performed by, in this case the uMDM before the finalisation and adoption of the organisational structure.

As the preparation of job descriptions is a timeous exercise it is recommended that a successful Municipality which has a similar vision and organisational / Departmental

structure be approached and in terms of co-operative governance engage in the exchange of job descriptions. It is obvious that these similar job descriptions may have to be modified to exactly suit the requirements of the different institution but this would save much time in the preparation thereof.

7.9 RECOMMENDATIONS FOR FUTURE RESEARCH

Further research could be performed on the following aspects associated with this dissertation as follows:

1. More investigation could have been performed into the organisational structures and systems utilised by other District municipalities, which could further influence the findings of this dissertation.
2. Further research can be performed on how to develop a rising block water tariff system for the uMDM, providing a methodology as to how the tariff system will be phased in.
3. This report excluded the finalisation of the investigations into the procuring of an ERP / finance system and an asset management system.

These three aspects can be researched at a later stage by another or the same researcher.

CHAPTER EIGHT

8 REFERENCES

Agranoff, R. and McGuire, M. (1999) *Managing in Network Settings*, Policy Studies Review vol. 16 no. 1.

Agranoff, R. and McGuire, M. (2001) *Getting Results through collaboration*, 1st Edition, United States of America, Quorum Books.

Anstey, M. (1999) *Managing Change, Negotiating Conflict*, 2nd Edition, South Africa, Juta & Co, Ltd.

Bardach, E. (1998) *Getting Agencies to work together: The practice and theory of managerial craftsmanship*, 1st Edition, United States of America, The Booking Institution.

Business Connection, (2006) *uMgungundlovu User Requirements Document for Water and Sanitation Telemetry and Operations Reporting Management Systems*, 2006, uMgungundlovu District Municipality.

Correia, C. Flynn, D. Uliana, E & Wormald, M. (2000) *Financial Management*, 4th Edition, South Africa, Juta & Co, Ltd.

Deloitte, (2005) *uMgungundlovu District Municipality, Water Billing Assessment Report*, 2005, uMgungundlovu District Municipality.

DWAF, (2001), *Speech by Minister Kasrils of DWAF on Free Basic Water "Tools for Local Government"* [Online], 9 paragraphs.

Available: http://www.dwaf.gov.za/dir_wss/tarifftool/html/introduction - cd - minister's speech v2- hm.doc [8/1/2001, 8 January]

Hazelton, D. (2006) *Sanitation and the new formula equitable share payments to local government*, Draft I, unpublished report, TSE water Services.

Hessing, M. & Howlett, M. (1997) *Canadian Natural Resource & Environmental Policy*, 1st Edition, Canada, UBC Press.

Hunter, C. (2002) *Managing People in South Africa*, 3rd Edition, South Africa, University of Kwa-Zulu Natal.

INGENIUM, IPWEA. (2006) *International Infrastructure Management Manual, South African Edition 2006*, New Zealand, INGENIUM & NAMS New Zealand.

Manganelli, R. Klein, M. (1994) *The Reengineering Handbook*, 1st Edition, United States of America, AMACOM.

Melnyk, S. and Denzler, D. (1996) *Operations Management, a value-Driven approach*, 1st Edition, United States of America, Irwin, a Times Mirror Higher Education Group, Inc. company.

Meredith, R. and Shafer, S. (2002) *Operations Management for MBAs*, 2nd Edition, United States of America, John Wiley & Sons, Inc.

Palmer Group, (2006) *District Water Services Managers' Forum*, uMgungundlovu Peer Review Report, Draft 1, Republic of South Africa, DWSMF.

Peters, B. (2001) *The Future of Governing*, 2nd Edition, United States of America, University Press of Kansas.

Puttick, G. and Van Esch, S. (2003) *The principles and practice of auditing, 8th Edition, South Africa*, Juta & Co, Ltd

Raturi, A. and Evans, J. (2005) *Principles of Operations Management*, Student Edition, United States of America, Thomson South-Western.

Republic of South Africa, (1996) *Constitution of South Africa*, Act No. 108 of 1996, Government Gazette No. 24744, Pretoria, Government printer.

Republic of South Africa, (1997) *Water Services Act, Act No. 108 of 1997*, Government Gazette No. 18522, Pretoria, Government printer.

Republic of South Africa, (1998a) *Municipal Structures Act No 117 of 1998*, Government Gazette No. 19614, Pretoria, Government printer.

Republic of South Africa, (1998c) *National Water Act, Act No. 36 of 1998*, Government Gazette No. 19182, Pretoria, Government printer.

Republic of South Africa, (1998d) *Employment Equity Act, Act No. 55 of 1998*, Government Gazette No. 27866, Pretoria, Government printer.

Republic of South Africa, (1998e) *State Information Technology Agency Act, Act No. 88 of 1998*, Government Gazette No. 19371, Pretoria, Government printer.

Republic of South Africa, (1999) *Public finance management act, Act No. 1 of 1999 as amended by Act 29 of 1999*, Government Gazette No. 19978, Pretoria, Government printer.

Republic of South Africa, (2000) *Municipal Systems Act No 32 of 2000*, Government Gazette No. 21776, Pretoria, Government printer.

Republic of South Africa, (2001) *Regulations under the Water Services Act, 1997 (ACT 108 of 1997)*. Government Gazette No 22355, Pretoria, Government printer.

Republic of South Africa, (2003a) *Municipal Finance Management Act, 2003 (Act No. 56 of 2003)*, Government gazette No 26945, Pretoria, Government printer.

Republic of South Africa, (2003b) *Regulations in terms of the Public Finance Management Act, 1999: Framework for Supply Chain Management*, Government gazette No. 25767, Pretoria, Government printer.

Republic of South Africa, (2005a) *Supply Chain Regulations*, Government Gazette No. 27636, Pretoria, Government printer.

Republic of South Africa, (2005b) Municipal Supply Chain Management Model Policy [Online], 44 Pages.

Available: <http://www.finance.gov.za/mfma/>

[25/8/2005, 25 August]

Republic of South Africa, (2006) *Division of Revenue Act, 2006 (Act No. 2 of 2006)*, Government Gazette No. 28700, Pretoria, Government printer.

Robbins, S. and Barnwell, N. (2002) *Organisation Theory: Concepts and cases*, 4th Edition, China, Prentice Hall.

SITA, (2006) Comparison of Financial Systems, Sourced from the IT section of the uMgungundlovu District Municipality, Pietermaritzburg.

Smit, P. Cronje, J. (1999) *Management Principles, A contemporary edition for Africa*, 2nd Edition, South Africa, Juta.

Spur, k., Layzell, P., Jennison, L. and Richards, N. (1993) *Software Assistance for Business Re-Engineering*, 1st Edition, Great Britain, John Wiley & Sons Ltd.

Steyn, B. Warren, B. & Jomker W. (1998) *Analysis, Valuation and Restructuring*, 1st Edition, South Africa, Renall Publishers cc.

Still, D. (2006) *Understanding real leakage rates from water reticulation: Implications for the planning and design of rural water supply systems*, proceedings of the Water Institute of Southern Africa, Biannual Conference, Durban.

Telkom, (2006) *Presentation provided by Keith Diederichs from Telkom on the VPN supreme overview*, 2006, Telkom (Pty) ltd.

Thompson Jr, A.A. and Strickland III, A.J. (2003) *Strategic Management: Concepts and Cases*. 13th Edition, New York, McGraw-Hill-Irwin.

uMDM, (2003) *Integrated Development Plan (IDP)*, uMgungundlovu District Municipality, P 29.

uMDM, (2005a) *Presentation given to Richmond local municipality on their network link*, uMgungundlovu District Municipality.

uMDM, (2005b) *Presentation given to the local municipality on proposed WAN link to the uMDM*, uMgungundlovu District Municipality.

uMDM, (2005c) *Management report proposing the WAN link between the local municipalities and the uMDM dated 2 December 2005*, uMgungundlovu District Municipality.

uMDM, (2006) *Systems investigation report: Implementation of the eThekweni Water Faultman system*, uMgungundlovu District Municipality.

uMDM, (2006a) *Minutes of a meeting on the procurement of an ERP/Financial software package held on 13 March 2006*, Meeting held at the uMgungundlovu District Municipality, Pietermaritzburg.

UWP, (2004a) *Support to the water and sanitation sector: Section 78 Assessment, Phase 1: Current status of service delivery report*, South Africa, uMDM.

UWP, (2004b) *Section 78 Assessment for the uMDM – Water and Sanitation provision*, South Africa, uMDM.

Whitten, J., Bentley, L. and Barlow, V. (1994) *System Analysis & Design Methods*, 3rd Edition, United States of America, Richard D. Irwin, Inc.

CHAPTER NINE

9 APPENDICES

- 9.1 APPENDIX A - The current organisational structures of the Municipalities.**
- 9.2 APPENDIX B - The model organisational structure framework developed from the literature review.**
- 9.3 APPENDIX C - The model reengineering implementation rollout programme programme**
- 9.4 APPENDIX D - The lists of staff proposed for the functioning of the WSPU as developed from the model organisational structure framework, per municipality.**
- 9.5 APPENDIX E - The structured questionnaire developed for the interviews.**
- 9.6 APPENDIX F - The summary of the results of the structured interviews.**
- 9.7 APPENDIX G - The final proposals in terms of organisational structure and the numbers of staff proposed for the establishment of the WSPU, per local business unit.**
- 9.8 APPENDIX H - The revised model reengineering implementation rollout programme as per the conclusions of the interviews with the reengineering team.**
- 9.9 APPENDIX I- Review of the uMgungundlovu District Municipality Peer Review Report.**

APPENDIX A

THE CURRENT ORGANISATIONAL STRUCTURES OF THE MUNICIPALITIES.

FIGURE 5: THE CURRENT STAFFING STRUCTURE OF THE UMGUNGUNDLOVU DISTRICT MUNICIPALITY (uMDM approved organogram)

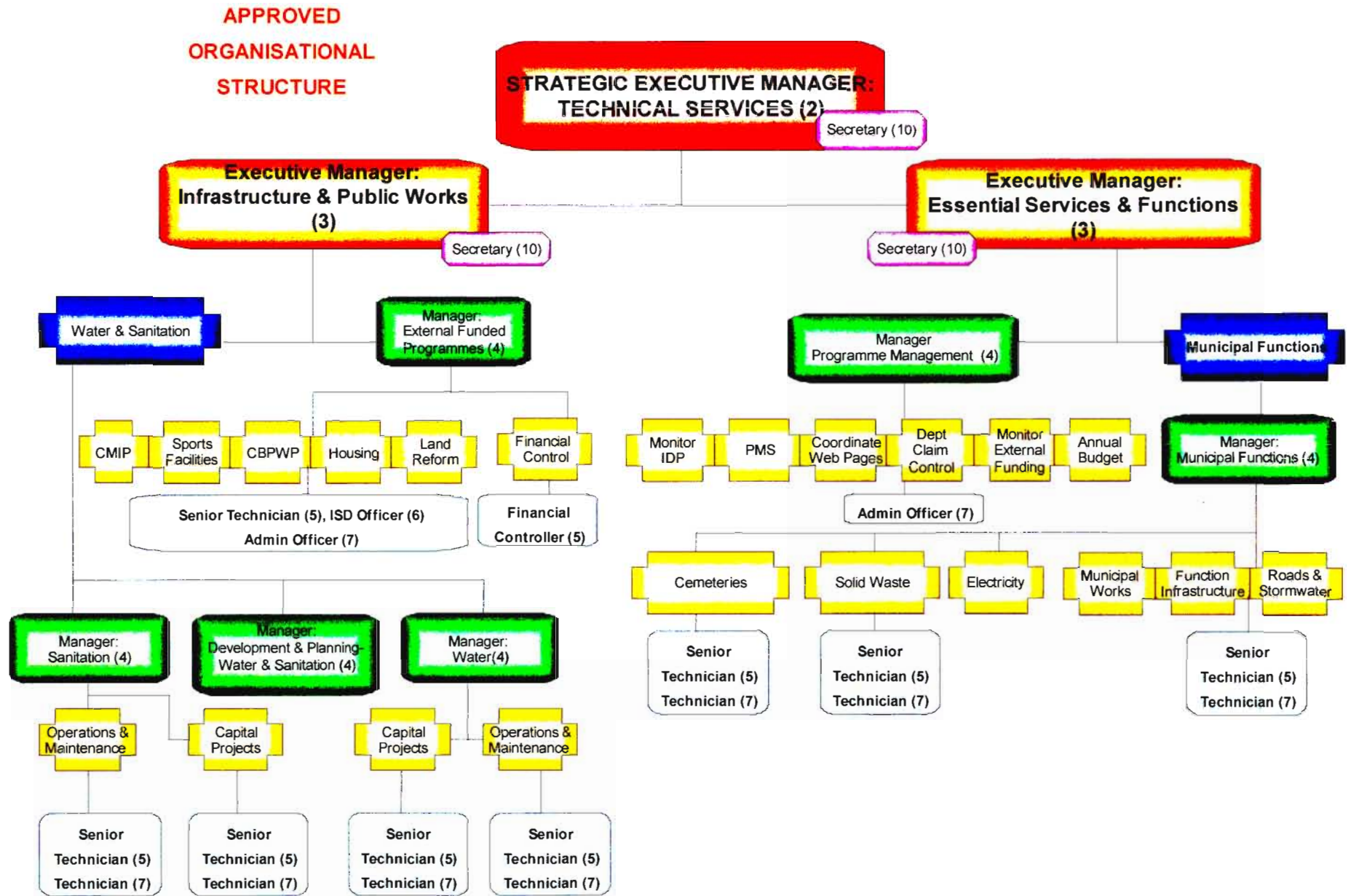


FIGURE 6: THE CURRENT STAFFING STRUCTURE OF THE UMSHWATHI LOCAL MUNICIPALITY
(UWP (2004a), Section 3, Annexure 1, Item 1.1)

**CURRENT WATER & SANITATION SERVICES
UMSHWATHI LOCAL MUNICIPALITY (KZ221)**

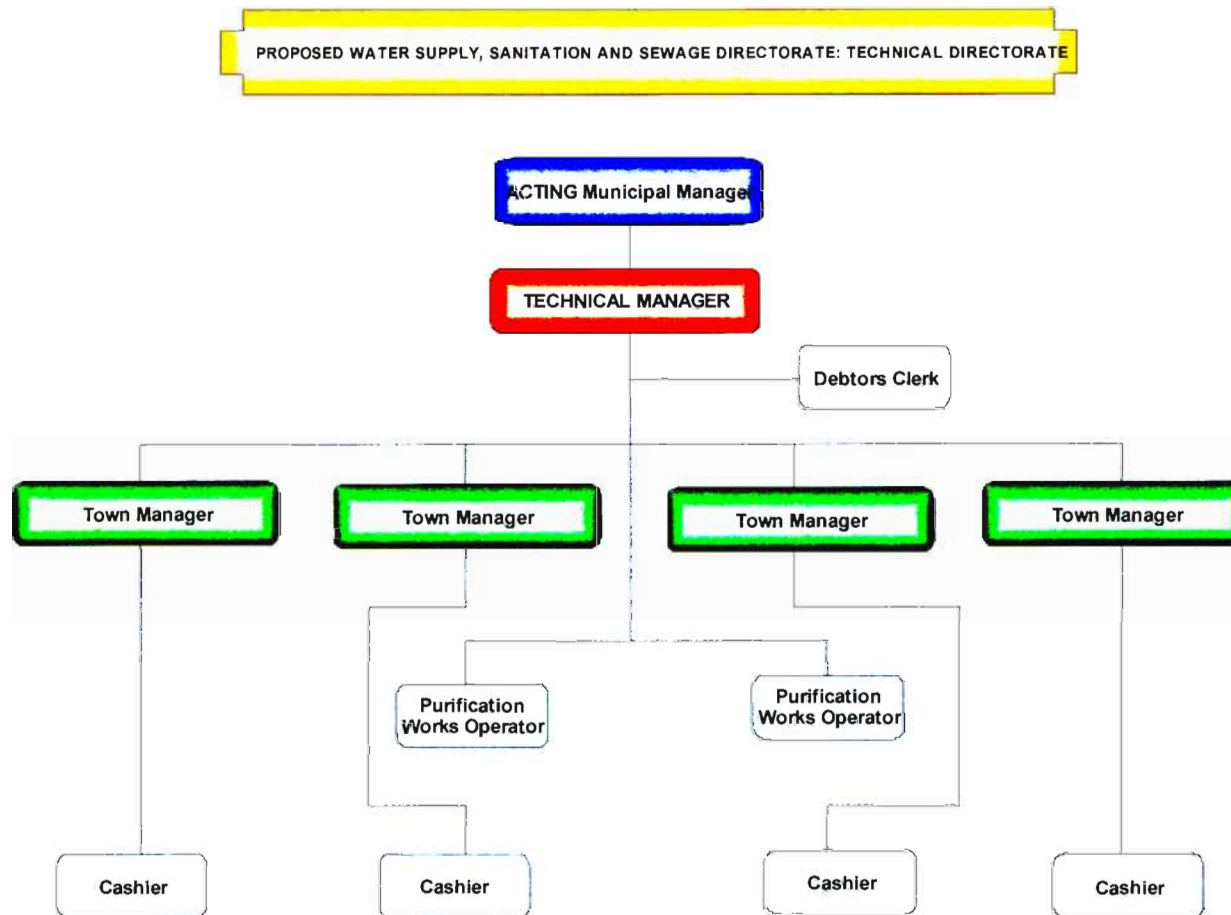
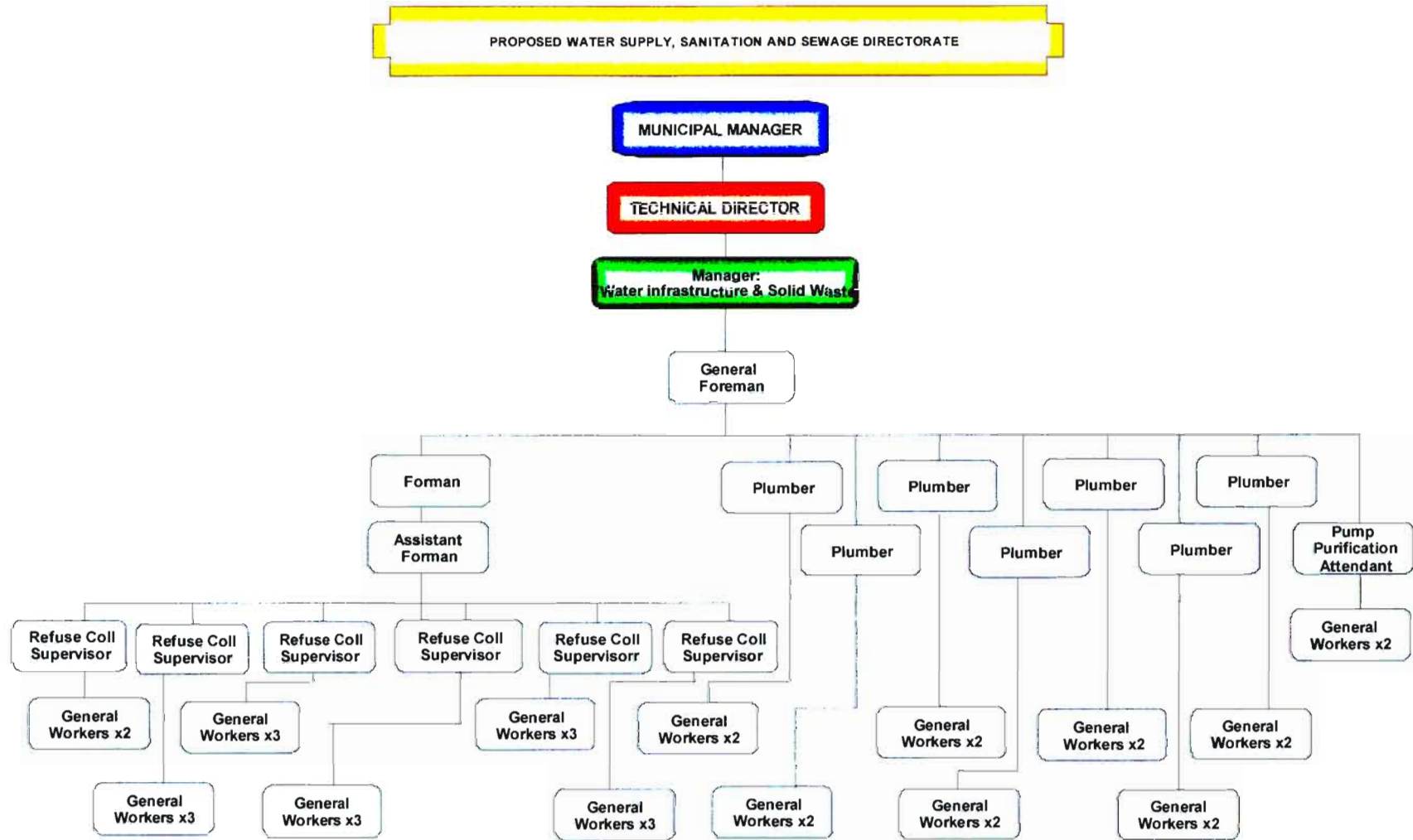


FIGURE 7: THE CURRENT STAFFING STRUCTURE OF THE UNGENI LOCAL MUNICIPALITY (UWP (2004a), Section 3, Annexure 1, Item 1.2)



CURRENT WATER & SANITATION SERVICES MPOFANA LOCAL MUNICIPALITY (KZ223)

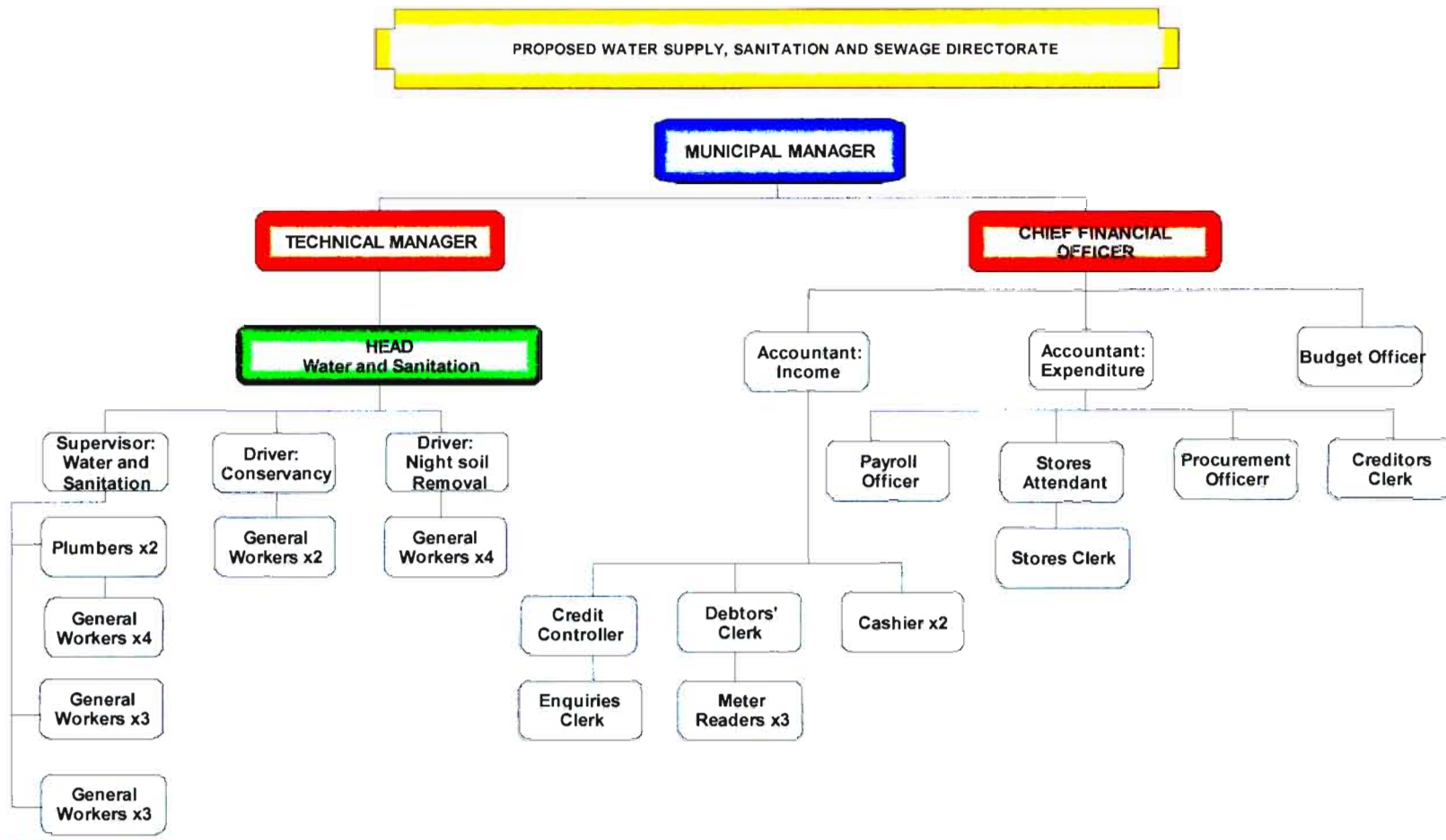


FIGURE 9: THE CURRENT STAFFING STRUCTURE OF THE IMPENDLE LOCAL MUNICIPALITY (UWP (2004a), Section 3, Annexure 1, Item 1.4)

**CURRENT WATER & SANITATION SERVICES
IMPENDLE LOCAL MUNICIPALITY (KZ224)**

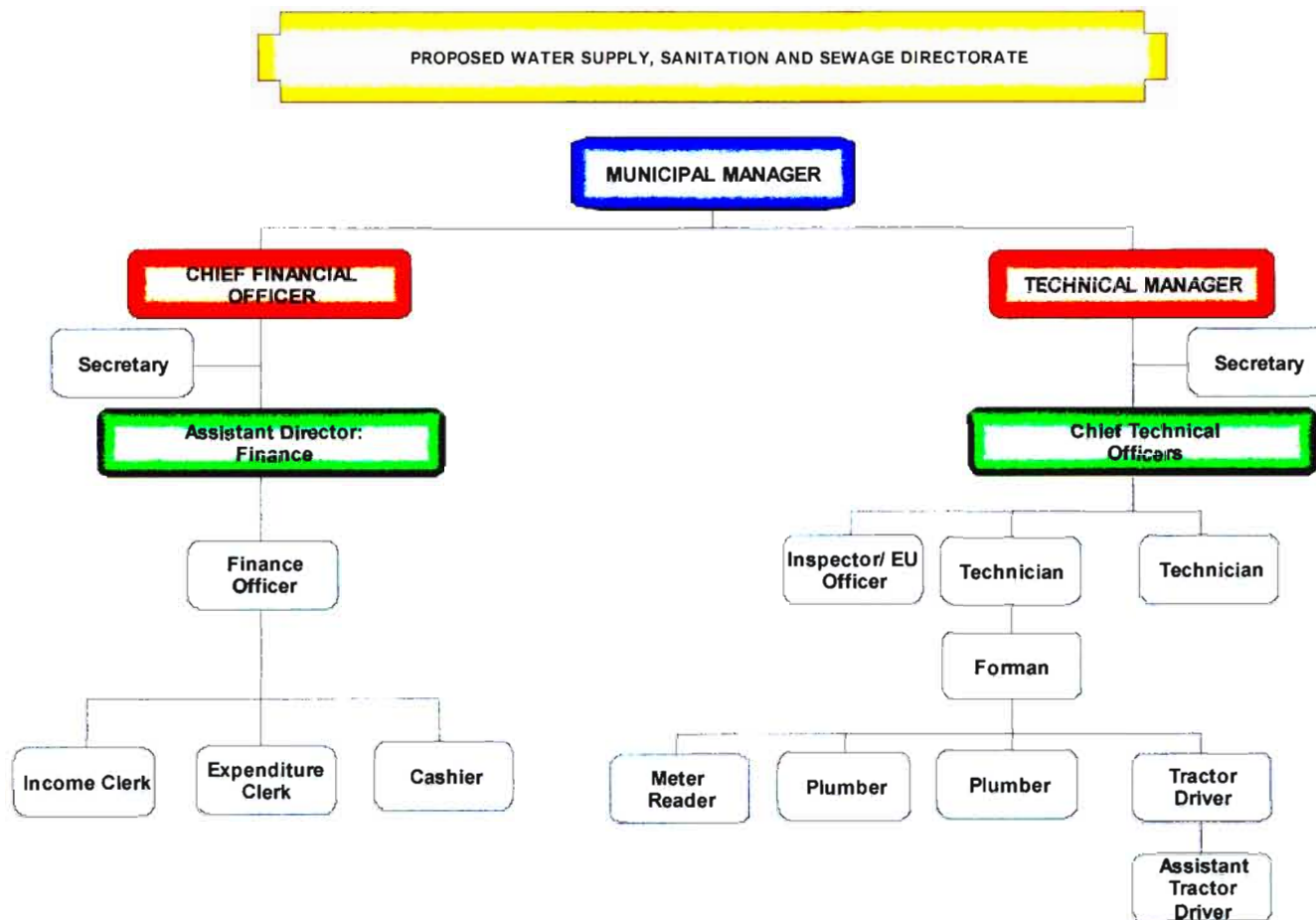


FIGURE 10: THE CURRENT STAFFING STRUCTURE OF THE MKHAMBATHINI LOCAL MUNICIPALITY (UWP (2004a), Section 3, Annexure 1, Item 1.5)

CURRENT WATER & SANITATION SERVICES MKHAMBATHINI LOCAL MUNICIPALITY (KZ226)

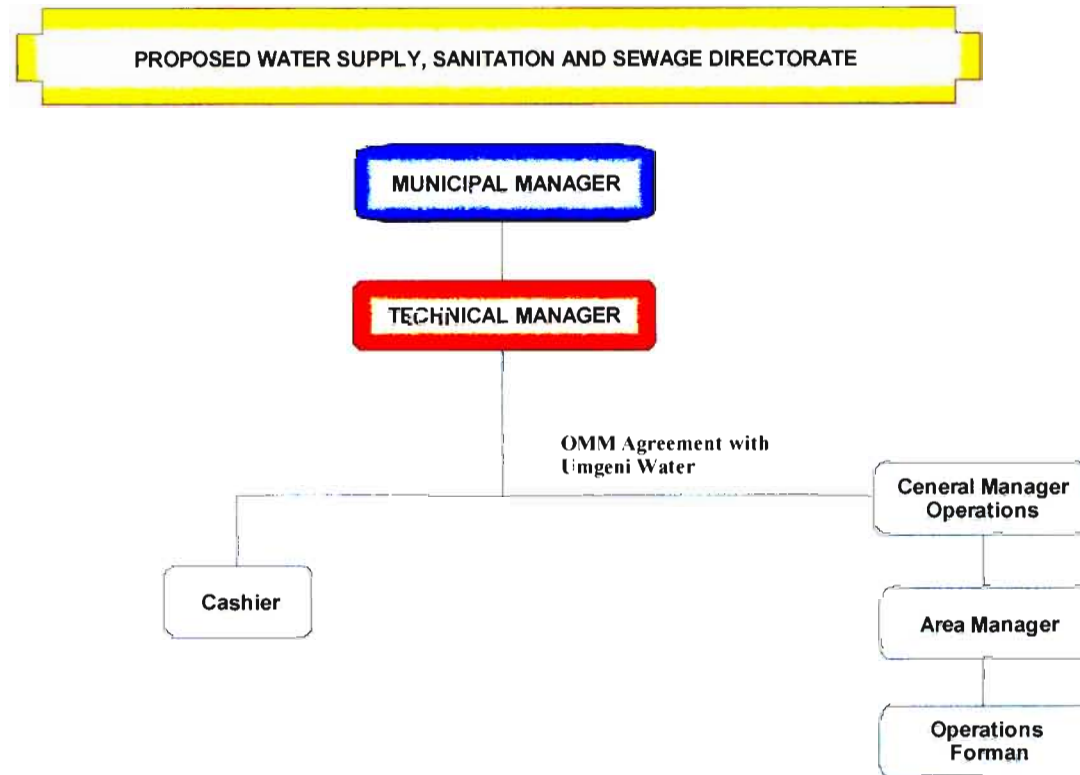
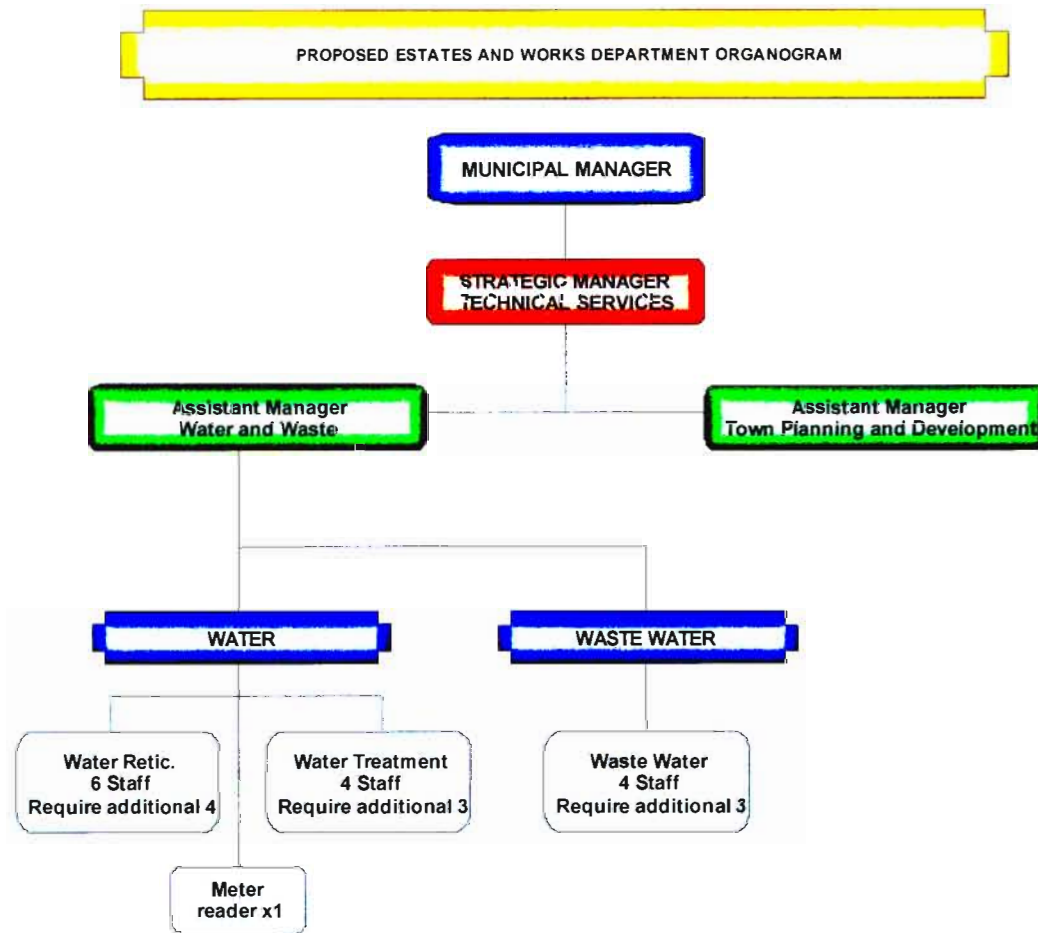


FIGURE 11: THE CURRENT STAFFING STRUCTURE OF THE RICHMOND LOCAL MUNICIPALITY (UWP (2004a), Section 3, Annexure 1, Item 1.6)

**CURRENT WATER & SANITATION SERVICES
RICHMOND LOCAL MUNICIPALITY (KZ227)**



APPENDIX B

**THE MODEL ORGANISATIONAL
STRUCTURE FRAMEWORK DEVELOPED
FROM THE LITERATURE REVIEW**

FIGURE 12: THE PROPOSED GENERAL STAFFING STRUCTURE OF THE WSPFU TO BE UTILISED AS A FRAMEWORK FOR THE uMGUNGUNDLOVU DISTRICT MUNICIPALITY

PROPOSED WATER & SANITATION SERVICES

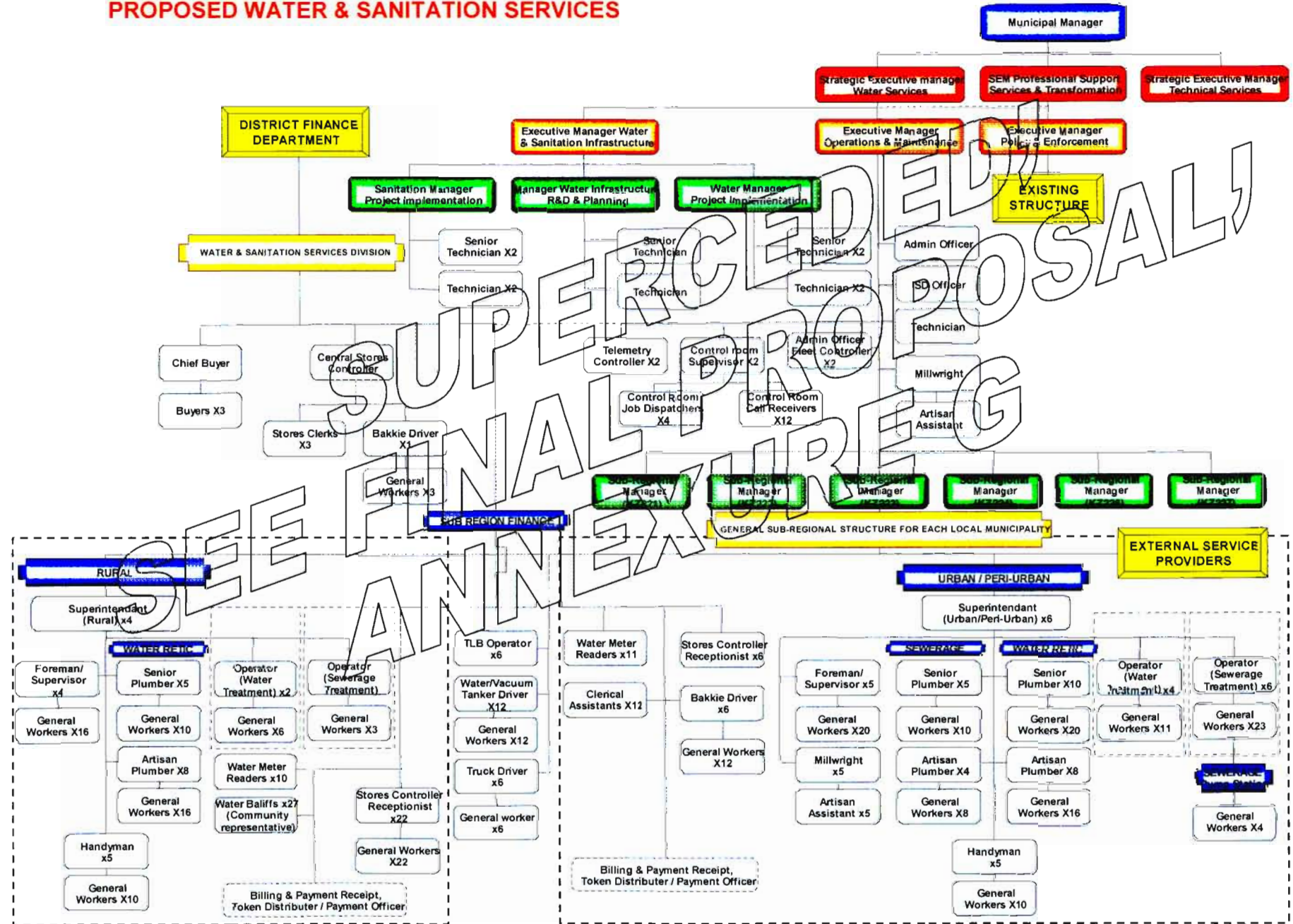


FIGURE 13: THE PROPOSED STAFFING STRUCTURE OF THE WSPU TO BE UTILISED AS A FRAMEWORK FOR THE UMSHWATHI BUSINESS UNIT

**PROPOSED WATER & SANITATION SERVICES
UMSHWATHI LOCAL MUNICIPALITY (KZ221)**

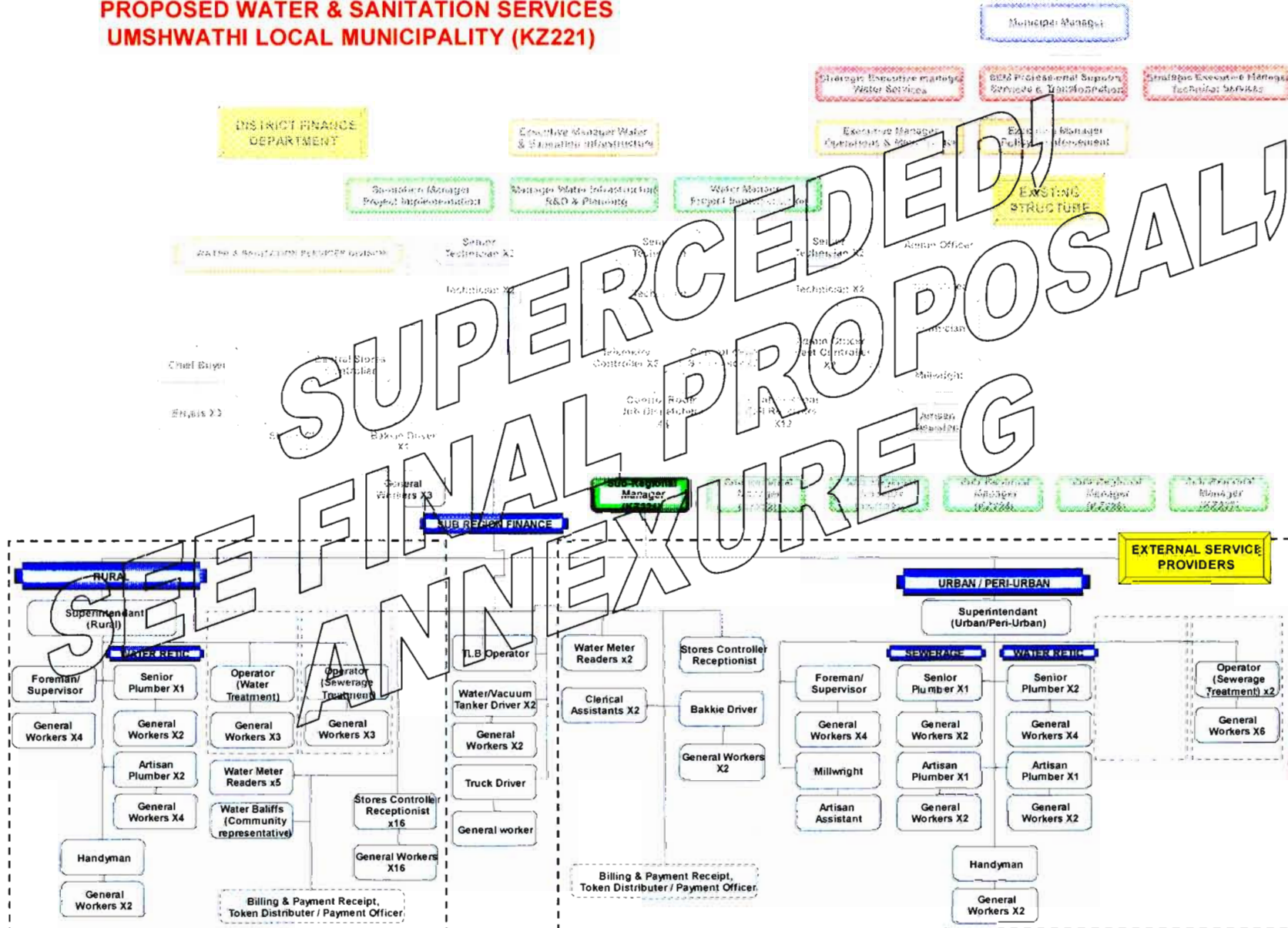


FIGURE 15: THE PROPOSED STAFFING STRUCTURE OF THE WSPU TO BE UTILISED AS A FRAMEWORK FOR THE MPOFANA BUSINESS UNIT

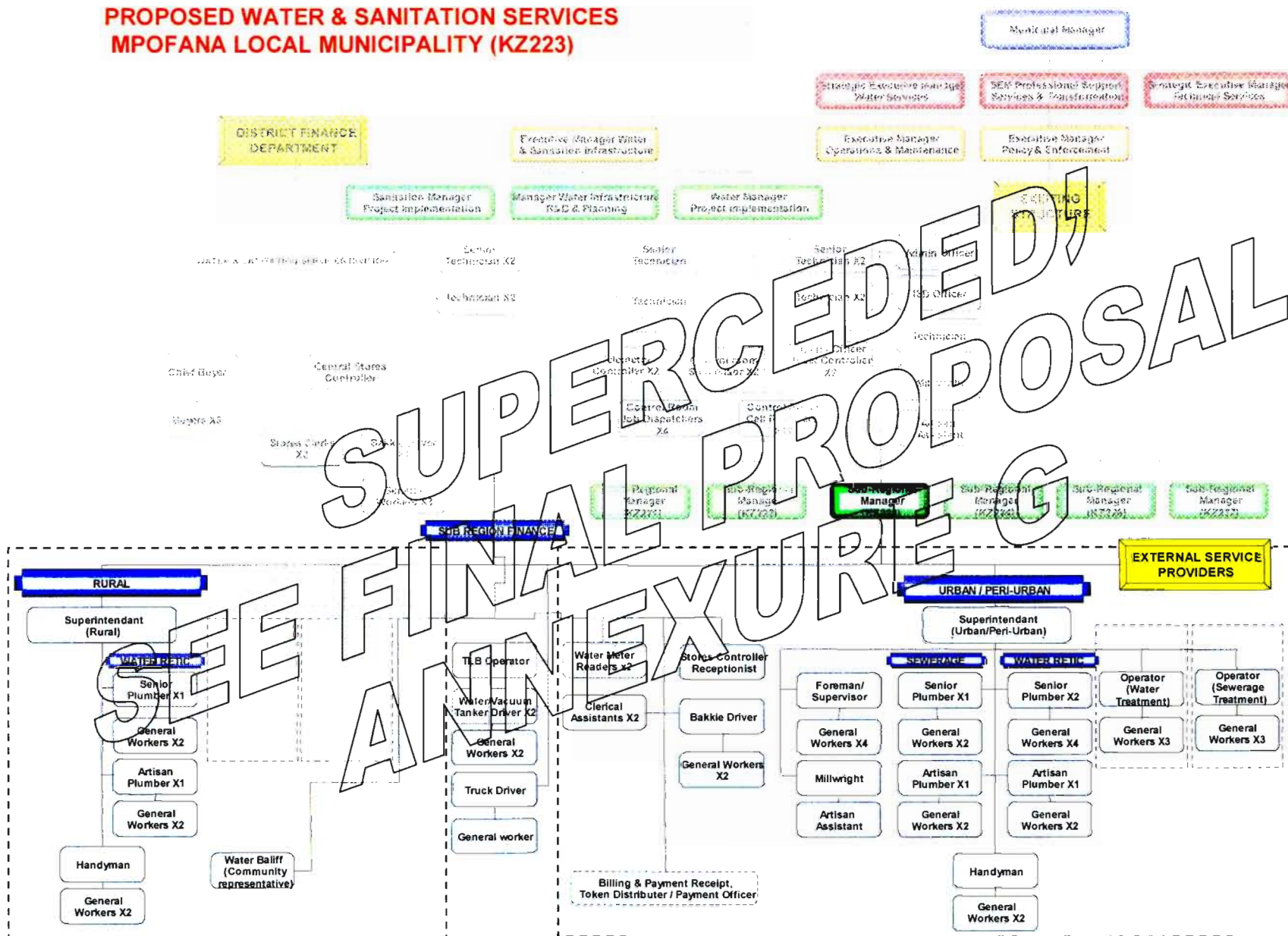
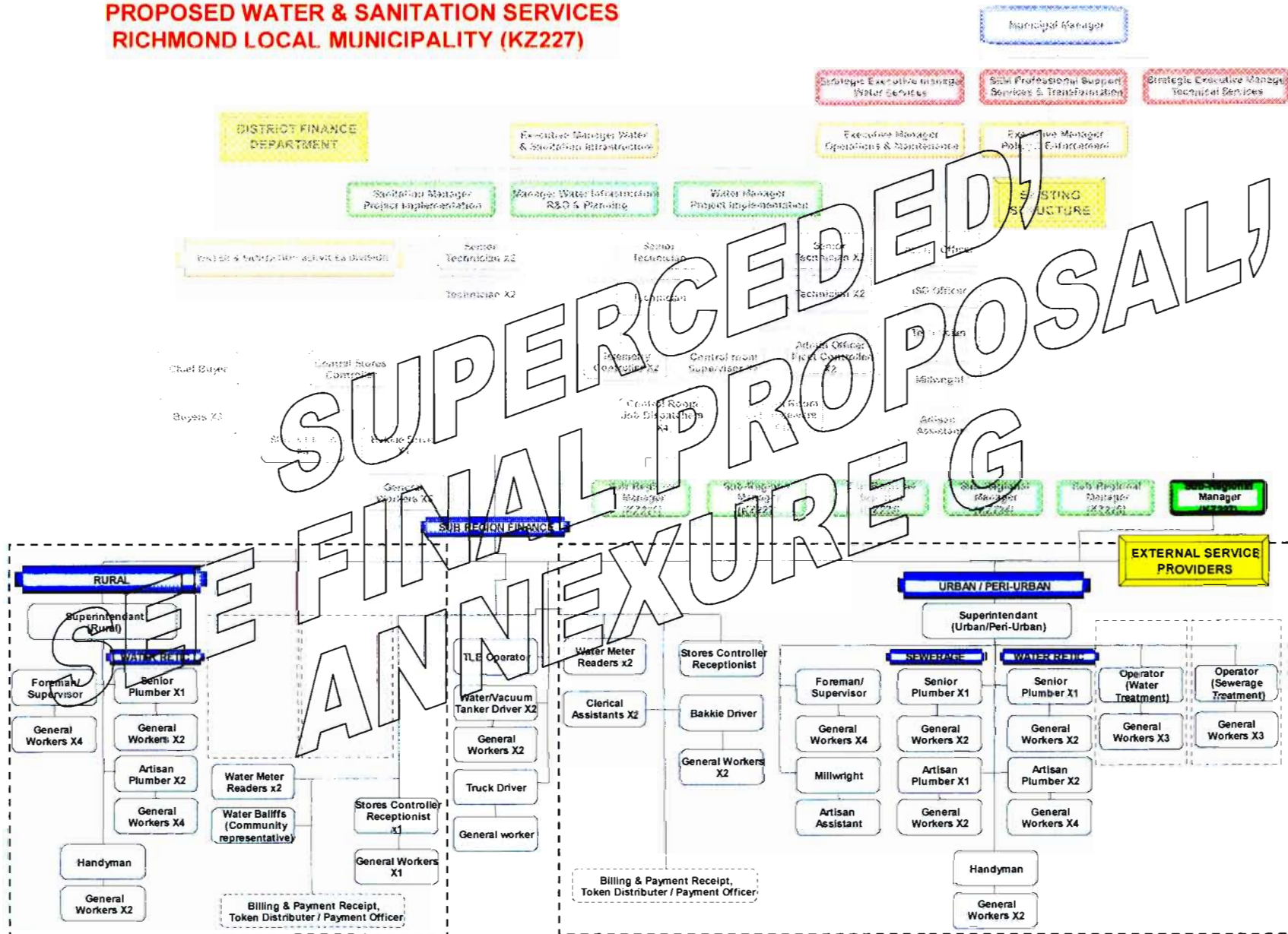


FIGURE 18: THE PROPOSED STAFFING STRUCTURE OF THE WSPU TO BE UTILISED AS A FRAMEWORK FOR THE RICHMOND BUSINESS UNIT

**PROPOSED WATER & SANITATION SERVICES
RICHMOND LOCAL MUNICIPALITY (KZ227)**



APPENDIX C

THE MODEL REENGINEERING IMPLEMENTATION ROLLOUT PROGRAMME

ID	Task Name	Duration	Start	Finish
1	Water and Sanitation Services Transfer Programme	181 days	Mon 21.11.05	Mon 31.07.06
2				
3	Planning	19 days	Mon 21.11.05	Thu 15.12.05
4	High level PERT and Gant charts	2 days	Mon 21.11.05	Tue 22.11.05
5	Communication Plan	1 day	Wed 23.11.05	Wed 23.11.05
6	Resource Allocation matrix	1 day	Thu 24.11.05	Thu 24.11.05
7	Presentation from each discipline	3 days	Fri 25.11.05	Tue 29.11.05
8	Requirements for next Phase	2 days	Wed 30.11.05	Thu 01.12.05
9	Project Plan Presentation to Manco	3 days	Fri 02.12.05	Tue 06.12.05
10	Present Project Plan to Local Municipalities	7 days	Wed 07.12.05	Thu 15.12.05
11	Local Municipality Analysis	26 days	Fri 16.12.05	Fri 20.01.06
12	Profile for each local Municipality	19 days	Fri 16.12.05	Wed 11.01.06
13	Human Resources	19 days	Fri 16.12.05	Wed 11.01.06
14	Gather information already received	8 days	Fri 16.12.05	Tue 27.12.05
15	Produce a profile of all the information that is required.	5 days	Wed 28.12.05	Tue 03.01.06
16	Produce a profile of milestones to be achieved to meet target date.	3 days	Wed 04.01.06	Fri 06.01.06
17	Identify Where Consultants will be required and for what?	3 days	Mon 09.01.06	Wed 11.01.06
18	Finance	19 days	Fri 16.12.05	Wed 11.01.06
19	Gather information already received	8 days	Fri 16.12.05	Tue 27.12.05
20	Produce a profile of all the information that is required.	5 days	Wed 28.12.05	Tue 03.01.06
21	Produce a profile of milestones to be achieved to meet target date.	3 days	Wed 04.01.06	Fri 06.01.06
22	Identify Where Consultants will be required and for what?	3 days	Mon 09.01.06	Wed 11.01.06
23	Technical	19 days	Fri 16.12.05	Wed 11.01.06
24	Gather information already received	8 days	Fri 16.12.05	Tue 27.12.05
25	Produce a profile of all the information that is required.	5 days	Wed 28.12.05	Tue 03.01.06
26	Produce a profile of milestones to be achieved to meet target date.	3 days	Wed 04.01.06	Fri 06.01.06
27	Identify Where Consultants will be required and for what?	3 days	Mon 09.01.06	Wed 11.01.06
28	Information Technology	19 days	Fri 16.12.05	Wed 11.01.06
29	Gather information already received	8 days	Fri 16.12.05	Tue 27.12.05
30	Produce a profile of all the information that is required.	5 days	Wed 28.12.05	Tue 03.01.06
31	Produce a profile of milestones to be achieved to meet target date.	3 days	Wed 04.01.06	Fri 06.01.06
32	Identify Where Consultants will be required and for what?	3 days	Mon 09.01.06	Wed 11.01.06
33	Phase PERT, Gant and RAM	3 days	Thu 12.01.06	Mon 16.01.06
34	Progress Report to Manco	4 days	Tue 17.01.06	Fri 20.01.06
35	HR Take on	98 days	Mon 23.01.06	Wed 07.06.06
36	Analysis of uMDM Proposed organogram	5 days	Mon 23.01.06	Fri 27.01.06
37	Incorporation of LM, Umgeni Water and DOW staff to District	83 days	Mon 30.01.06	Wed 24.05.06
38	LM Employee Database	37 days	Mon 30.01.06	Tue 21.03.06
39	Obtaining Local Municipalities staff details.	8 days	Mon 30.01.06	Wed 08.02.06
40	Obtaining Local Municipalities salary schedules	8 days	Thu 09.02.06	Mon 20.02.06
41	Obtaining Local Municipalities staff Job Descriptions and job analysis questionnaires	8 days	Tue 21.02.06	Thu 02.03.06
42	Investigation into whether staff accommodation and other benefits are provided by LM's	3 days	Fri 03.03.06	Tue 07.03.06
43	Aligning of Local Municipality Staff to be transferred to uMDM Organogram	10 days	Wed 08.03.06	Tue 21.03.06
44	Umgeni Water and DOW Employee Database	41 days	Mon 30.01.06	Mon 27.03.06
50	Preparation of employment offers	10 days	Tue 28.03.06	Mon 10.04.06
51	Meeting with staff and unions	8 days	Tue 11.04.06	Thu 20.04.06
52	Final offer of employment contracts	8 days	Fri 21.04.06	Tue 02.05.06
53	Data Capturing	8 days	Wed 03.05.06	Fri 12.05.06
54	Induction of transferred staff	3 days	Mon 15.05.06	Wed 17.05.06
55	Submission of salary details to finance department	2 days	Thu 18.05.06	Fri 19.05.06
56	Leave capturing and opening personal files	3 days	Mon 22.05.06	Wed 24.05.06
57	External service providers	5 days	Mon 30.01.06	Fri 03.02.06
58	Formulation of external service provider agreements for short term contracts. (Water committees, Plumbers, Postal services and other)	5 days	Mon 30.01.06	Fri 03.02.06
59	Performance awards policy	5 days	Thu 25.05.06	Wed 31.05.06
60	Report to Manco	3 days	Thu 01.06.06	Mon 05.06.06
61	Report to HR Committee	2 days	Tue 06.06.06	Wed 07.06.06
62	Water Services Authority	70 days	Mon 23.01.06	Fri 28.04.06
63	Revision of the WSDP	70 days	Mon 23.01.06	Fri 28.04.06
64	Ensure the promulgation/review of by-laws necessary for the effective provision of water services.	50 days	Mon 23.01.06	Fri 31.03.06
65	Ensure the adoption of a Credit Control and Debt Collection by-laws and Policy that includes an indigent policy.	50 days	Mon 23.01.06	Fri 31.03.06
66	Water tariffs	65 days	Mon 23.01.06	Fri 21.04.06
67	Obtaining water and sanitation tariff structures from LM's	20 days	Mon 23.01.06	Fri 17.02.06
68	Ensure the adoption of a Water Tariff by-laws and Policy that includes for addressing free basic water.	20 days	Mon 20.02.06	Fri 17.03.06
69	Ensure the adoption of a Sanitation Tariff by-laws and Policy that includes for addressing free basic Sanitation.	20 days	Mon 20.03.06	Fri 14.04.06
70	Finalization of tariff policies	5 days	Mon 17.04.06	Fri 21.04.06
71	Estimated capital and operating costs of those water services and the financial arrangements for funding those water services, including the tariff structures	70 days	Mon 23.01.06	Fri 28.04.06
72	Ensure that all permits, licenses, exemptions, permissions and approvals that may be necessary in respect of the provision of water services are in place.	70 days	Mon 23.01.06	Fri 28.04.06

ID	Task Name	Duration	Start	Finish
73	Prepare possible service delivery agreement (WSP contract) which includes details of financial arrangements.	70 days	Mon 23.01.06	Fri 28.04.06
74	Develop Consumer Charter in consultation with consumers that fulfils the requirements for conditions for provision of water services as set out in Section 4 of the Act, provides a system for dealing with consumers' complaints and rights to redress.	70 days	Mon 23.01.06	Fri 28.04.06
75	Finalise negotiations concerning service delivery agreement.	70 days	Mon 23.01.06	Fri 28.04.06
76	Establish mechanism and programme for community consultation and information dissemination regarding the service delivery agreement (section 80(2) of the Municipal Systems Act)	70 days	Mon 23.01.06	Fri 28.04.06
77	Communicate contents of service delivery agreement to local community through the media	70 days	Mon 23.01.06	Fri 28.04.06
78	Promote water conservation and demand management	70 days	Mon 23.01.06	Fri 28.04.06
79	Finalize Contractds with Bulk Water Providers.	70 days	Mon 23.01.06	Fri 28.04.06
80	Ensure that contract/s are in place to monitor and regulate service provision	70 days	Mon 23.01.06	Fri 28.04.06
81	If WSA is the WSP, Ensure Performance Management Contract with senior WSP managers	70 days	Mon 23.01.06	Fri 28.04.06
82	Finance Take On	104 days	Mon 23.01.06	Thu 15.06.06
83	Consumer Database	80 days	Mon 23.01.06	Fri 12.05.06
84	Extraction of a database of all consumers connections in each LM (Developed Areas)	5 days	Mon 23.01.06	Fri 27.01.06
85	Linking all LM's Financial System to DM, to extract water and sanitation transactions	40 days	Mon 30.01.06	Fri 24.03.06
86	Inclusion of all consumer connections into a GIS spacial format	20 days	Mon 27.03.06	Fri 21.04.06
87	Linking all rural offices to DM (Undeveloped areas)	80 days	Mon 23.01.06	Fri 12.05.06
88	Rural settlement consumer address allocation system	40 days	Mon 23.01.06	Fri 17.03.06
89	Assigning an address (number system) to each dwelling in the rural informal settlement areas	40 days	Mon 23.01.06	Fri 17.03.06
90	Inclusion of all consumer connections into a GIS spacial format (Undeveloped areas)	20 days	Mon 23.01.06	Fri 17.02.06
91	Procurement	28 days	Mon 23.01.06	Wed 01.03.06
92	Finalization of uMDM Procurement Procedures model to be adopted.	28 days	Mon 23.01.06	Wed 01.03.06
93	Service provider database (Short term Contract plumbing services or other outsourcing)	2 days	Mon 23.01.06	Tue 24.01.06
94	Material Supplier database	5 days	Wed 25.01.06	Tue 31.01.06
95	Procurement of service providers on contract (e.g. Water committees, Plumbers,Postal services and other)	21 days	Wed 01.02.06	Wed 01.03.06
96	Procurement of materials for stores	14 days	Mon 23.01.06	Thu 09.02.06
97	Procurement of specialized machinery, plant and equipment (purchase and rental)	14 days	Mon 23.01.06	Thu 09.02.06
98	Procurement of materials for emergency maintenance work. (Disaster and other emergency work)	14 days	Mon 23.01.06	Thu 09.02.06
99	Procurement of service providers for emergency maintenance work. (Disaster and other emergency work)	14 days	Mon 23.01.06	Thu 09.02.06
100	Procurement of infrastructure	20 days	Mon 23.01.06	Fri 17.02.06
101	Management of Stores	3 days	Mon 20.02.06	Wed 22.02.06
102	Stock Control internal administration procededures	3 days	Mon 20.02.06	Wed 22.02.06
103	Requisitions	3 days	Mon 20.02.06	Wed 22.02.06
104	Orders	3 days	Mon 20.02.06	Wed 22.02.06
105	Emergency orders	3 days	Mon 20.02.06	Wed 22.02.06
106	Delivery Notes	3 days	Mon 20.02.06	Wed 22.02.06
107	GRN	3 days	Mon 20.02.06	Wed 22.02.06
108	Payment authorization	3 days	Mon 20.02.06	Wed 22.02.06
109	Stock Control	3 days	Mon 20.02.06	Wed 22.02.06
110	Stock Taking	3 days	Mon 20.02.06	Wed 22.02.06
111	Operation & Maintenance Costs	10 days	Mon 24.04.06	Fri 05.05.06
112	Obtain O & M costs from all LM's, Umgeni Water and DOW.	10 days	Mon 24.04.06	Fri 05.05.06
113	Staff accomodation	8 days	Mon 23.01.06	Wed 01.02.06
114	Investigation into where staff accomodation is required (Link to HR)	8 days	Mon 23.01.06	Wed 01.02.06
115	Formulate policy for the payment of staff accomodation and other benefits	5 days	Mon 23.01.06	Fri 27.01.06
116	Billing	35 days	Mon 23.01.06	Fri 10.03.06
117	Meter reading	35 days	Mon 23.01.06	Fri 10.03.06
118	Policy for On time billing and meter reading of consumer water meters	2 days	Mon 23.01.06	Tue 24.01.06
119	Data Capture and verification of consumption	8 days	Wed 25.01.06	Fri 03.02.06
120	Policy for Disconnection of meters or setting to trickle flow.	3 days	Mon 06.02.06	Wed 08.02.06
121	Recording information on new water meter installations and inclusion into finance database	8 days	Thu 09.02.06	Mon 20.02.06
122	Linking consumption and payment for consumption to the GIS system.	14 days	Tue 21.02.06	Fri 10.03.06
123	Billing Procedures	12 days	Mon 23.01.06	Tue 07.02.06
124	Billing system to be linked to procurement unit and stores	3 days	Mon 23.01.06	Wed 25.01.06
125	Billing system to be linked to Fixed Assets Register and GIS	3 days	Thu 26.01.06	Mon 30.01.06
126	Billing system must be linked to creditors system . E.g. meter and serial number linked to supplier	3 days	Tue 31.01.06	Thu 02.02.06
127	Billing system linked to Budget	3 days	Fri 03.02.06	Tue 07.02.06
128	Invoice Payment Procedures and policy	20 days	Mon 08.05.06	Fri 02.06.06
129	Bill Format and Content	3 days	Mon 08.05.06	Wed 10.05.06
130	Bill printing and distribution	3 days	Thu 11.05.06	Mon 15.05.06
131	Cash handling systems	3 days	Tue 16.05.06	Thu 18.05.06
132	Payment methods and options	3 days	Fri 19.05.06	Tue 23.05.06

ID	Task Name	Duration	Start	Finish
133	Establishing how the users in the rural informal settlement areas are to be billed and how payment will be made.	5 days	Wed 24.05.06	Tue 30.05.06
134	Access to Billing / receipts database	3 days	Wed 31.05.06	Fri 02.06.06
135	Work flow audit system	4 days	Mon 05.06.06	Thu 08.06.06
136	Payroll / Clock card system or other	2 days	Mon 05.06.06	Tue 06.06.06
137	Job cards with audit trail	2 days	Wed 07.06.06	Thu 08.06.06
138	Asset Management	60 days	Mon 23.01.06	Fri 14.04.06
139	Transfer of existing infrastructure	50 days	Mon 23.01.06	Fri 31.03.06
140	Local Municipality Infrastructure	40 days	Mon 23.01.06	Fri 17.03.06
141	Finalization of asset registers for LM's	20 days	Mon 23.01.06	Fri 17.02.06
142	Valuation of infrastructure to be transferred	20 days	Mon 20.02.06	Fri 17.03.06
143	Department of Works Infrastructure	50 days	Mon 23.01.06	Fri 31.03.06
144	Appelsbosch water treatment and Sewage treatment works	20 days	Mon 23.01.06	Fri 17.02.06
145	Finalization of asset registers for Other Infrastructure	20 days	Mon 20.02.06	Fri 17.03.06
146	Valuation of infrastructure to be transferred	10 days	Mon 20.03.06	Fri 31.03.06
147	Umgeni Water Infrastructure	40 days	Mon 23.01.06	Fri 17.03.06
148	Finalization of asset registers for LM's	20 days	Mon 23.01.06	Fri 17.02.06
149	Valuation of infrastructure to be transferred	20 days	Mon 20.02.06	Fri 17.03.06
150	Auditing and reporting of Assets	10 days	Mon 03.04.06	Fri 14.04.06
151	Insurance policies	2 days	Mon 17.04.06	Tue 18.04.06
152	Infrastructure and equipment	2 days	Mon 17.04.06	Tue 18.04.06
153	Vehicle insurances	2 days	Mon 17.04.06	Tue 18.04.06
154	Public and staff liability	2 days	Mon 17.04.06	Tue 18.04.06
155	Group life cover for employees	2 days	Mon 17.04.06	Tue 18.04.06
156	Budgeting	38 days	Wed 19.04.06	Fri 09.06.06
157	Revenue	12 days	Wed 19.04.06	Thu 04.05.06
158	Forecast of revenue streams	10 days	Wed 19.04.06	Tue 02.05.06
159	Reporting on revenue received	2 days	Wed 03.05.06	Thu 04.05.06
160	Expenditure	38 days	Wed 19.04.06	Fri 09.06.06
161	Infrastructure	38 days	Wed 19.04.06	Fri 09.06.06
162	Capex and control reporting	14 days	Wed 19.04.06	Mon 08.05.06
163	Property acquisitions	2 days	Wed 19.04.06	Thu 20.04.06
164	Property leases	2 days	Fri 21.04.06	Mon 24.04.06
165	Water treatment plants	2 days	Tue 25.04.06	Wed 26.04.06
166	Water reticulation (Bulk & distribution reticulation)	2 days	Thu 27.04.06	Fri 28.04.06
167	Basic Water supply (Spring Protections, Borehole hand pumps)	2 days	Mon 01.05.06	Tue 02.05.06
168	Sewerage Reticulation (Bulk & Distribution)	1 day	Wed 03.05.06	Wed 03.05.06
169	Sewage treatment works	1 day	Thu 04.05.06	Thu 04.05.06
170	Basic sanitation (VIP toilets)	1 day	Fri 05.05.06	Fri 05.05.06
171	Reporting procedures for financial expenditure	1 day	Mon 08.05.06	Mon 08.05.06
172	Opex and control reporting	38 days	Wed 19.04.06	Fri 09.06.06
173	Refurbishment and maintenance of buildings	2 days	Wed 19.04.06	Thu 20.04.06
174	Water treatment plants	2 days	Fri 21.04.06	Mon 24.04.06
175	Water reticulation (Bulk & distribution reticulation)	2 days	Tue 25.04.06	Wed 26.04.06
176	Basic Water supply (Spring Protections, Borehole hand pumps)	2 days	Thu 27.04.06	Fri 28.04.06
177	Water tankering service	2 days	Mon 01.05.06	Tue 02.05.06
178	Sewerage Reticulation (Bulk & Distribution)	2 days	Wed 03.05.06	Thu 04.05.06
179	Sewage treatment works	2 days	Fri 05.05.06	Mon 08.05.06
180	Basic sanitation (VIP toilets)	2 days	Tue 09.05.06	Wed 10.05.06
181	Vacume tanker service	2 days	Thu 11.05.06	Fri 12.05.06
182	Transportation	1 day	Mon 15.05.06	Mon 15.05.06
183	Health, Safety and Security Costs	1 day	Tue 16.05.06	Tue 16.05.06
184	Insurance on infrastructure and equipment	1 day	Wed 17.05.06	Wed 17.05.06
185	Reporting procedures for Opex expenditure	1 day	Fri 09.06.06	Fri 09.06.06
186	Remuneration and Benefits	8 days	Wed 19.04.06	Fri 28.04.06
187	Permanent employees	4 days	Wed 19.04.06	Mon 24.04.06
188	Contract employees	4 days	Tue 25.04.06	Fri 28.04.06
189	Awareness campaigns	2 days	Wed 19.04.06	Thu 20.04.06
190	Promote a culture of payment	2 days	Wed 19.04.06	Thu 20.04.06
191	Report to Manco	2 days	Mon 12.06.06	Tue 13.06.06
192	Report to Finance Committee	2 days	Wed 14.06.06	Thu 15.06.06
193	Technical Take On	103 days	Mon 23.01.06	Wed 14.06.06
194	Start	103 days	Mon 23.01.06	Wed 14.06.06
195	Projects Asset Database	16 days	Mon 23.01.06	Mon 13.02.06
196	Obtain Hard / electronic copies of drawings, GIS if available, of all water and sanitation schemes.	10 days	Mon 23.01.06	Fri 03.02.06
197	Obtain a full asset register from LM's, Umgeni Water and DOW's of all water and Sanitation Schemes, Plant and equipment.	14 days	Mon 23.01.06	Thu 09.02.06
198	Finalization of Asset Registers	2 days	Fri 10.02.06	Mon 13.02.06
199	Water Supply	11 days	Tue 14.02.06	Tue 28.02.06
200	Audit of Existing Water schemes	10 days	Tue 14.02.06	Mon 27.02.06
201	Ascertain the consistency of supply	10 days	Tue 14.02.06	Mon 27.02.06
202	Ascertain the financial viability and technical sustainability of the Schemes.	10 days	Tue 14.02.06	Mon 27.02.06
203	Ascertain the Quality of water provided.	10 days	Tue 14.02.06	Mon 27.02.06

ID	Task Name	Duration	Start	Finish
204	Water Purification treatment process utilized.	10 days	Tue 14.02.06	Mon 27.02.06
205	Frequency of water quality analysis (Potable Water)	10 days	Tue 14.02.06	Mon 27.02.06
206	Statutory compliance to Water Quality Specifications	10 days	Tue 14.02.06	Mon 27.02.06
207	Who is appointed to do the water quality testing (Tender for Service Provision)	10 days	Tue 14.02.06	Mon 27.02.06
208	Sustainability of water sources	5 days	Tue 14.02.06	Mon 20.02.06
209	Monitoring of borehole supplies (Tender for a service Contract)	5 days	Tue 14.02.06	Mon 20.02.06
210	Monitoring of other water sources (Tender for a service contract)	5 days	Tue 14.02.06	Mon 20.02.06
211	Finalization of Water Supply	1 day	Tue 28.02.06	Tue 28.02.06
212	Sanitation Provision	23 days	Tue 14.02.06	Thu 16.03.06
213	Audit of Existing Sanitation infrastructure	10 days	Tue 14.02.06	Mon 27.02.06
214	Sewage treatment plant process utilized.	10 days	Tue 14.02.06	Mon 27.02.06
215	Ascertain the Quality of effluent discharged.	11 days	Tue 28.02.06	Tue 14.03.06
216	Frequency of water quality analysis (Effluent discharges)	10 days	Tue 28.02.06	Mon 13.03.06
217	Statutory compliance to Water Quality Specifications	10 days	Tue 28.02.06	Mon 13.03.06
218	Who is appointed to do the water quality testing (Tender for Service Provision)	10 days	Wed 01.03.06	Tue 14.03.06
219	Finalization of Sanitation Provision	2 days	Wed 15.03.06	Thu 16.03.06
220	Infrastructure	50 days	Fri 17.03.06	Thu 25.05.06
221	Official offices for the operation division	20 days	Fri 17.03.06	Thu 13.04.06
222	Stores in each Local Municipality	8 days	Fri 17.03.06	Tue 28.03.06
223	Central operation department offices and Stores in PMB	30 days	Fri 17.03.06	Thu 27.04.06
224	Finalization of Infrastructure	20 days	Fri 28.04.06	Thu 25.05.06
225	Operations	87 days	Tue 14.02.06	Wed 14.06.06
226	Service agents for the following services:	40 days	Tue 14.02.06	Mon 10.04.06
227	Electricity instalations (Tender for Service Provision)	40 days	Tue 14.02.06	Mon 10.04.06
228	Telemetry systems (Tender for Service Provision)	40 days	Tue 14.02.06	Mon 10.04.06
229	Repair of PRV's and pumping equipment (Tender for Service Provision)	40 days	Tue 14.02.06	Mon 10.04.06
230	Water quality testing (Tender for Service Provision)	40 days	Tue 14.02.06	Mon 10.04.06
231	Telecommunications (Tender for Service Provision)	40 days	Tue 14.02.06	Mon 10.04.06
232	Water source Monitoring (Possible)	40 days	Tue 14.02.06	Mon 10.04.06
233	Specialized machinery and Equipment	40 days	Tue 14.02.06	Mon 10.04.06
234	Armed Security Service (Tender for Service Provision)	40 days	Tue 14.02.06	Mon 10.04.06
235	Vehicle Maintenance Service (Tender for Service Provision)	40 days	Tue 14.02.06	Mon 10.04.06
236	Other Specialized maintenance works (Welders and Engineering services)	40 days	Tue 14.02.06	Mon 10.04.06
237	Finalization of Service Agreements	2 days	Tue 11.04.06	Wed 12.04.06
238	Preventative Maintenance	16 days	Wed 29.03.06	Wed 19.04.06
239	Investigate what Maintenance Planning and scheduling exists in LM's	8 days	Wed 29.03.06	Fri 07.04.06
240	Servicing of Pumps, Pessure reducing valves etc.	8 days	Wed 29.03.06	Fri 07.04.06
241	Verification and Replacement of damaged Isolating valves, fire hydrants etc.	8 days	Wed 29.03.06	Fri 07.04.06
242	General maintenance, e.g. painting of pipe markerposts, ensuring access to valve covers, replacement of damaged locks.	8 days	Wed 29.03.06	Fri 07.04.06
243	Scheduled inspections of reservoirs (Structural integrity, water tightness, cleaning)	8 days	Wed 29.03.06	Fri 07.04.06
244	Pressure and flow logging to determine pressure management failures	8 days	Mon 10.04.06	Wed 19.04.06
245	Operation & Maintenance Manuals (Tender for Service Provision)	40 days	Fri 17.03.06	Thu 11.05.06
246	Preparation of Operation & Maintenance manuals for Water treatment plants	40 days	Fri 17.03.06	Thu 11.05.06
247	Preparation of Operation & Maintenance manuals for Sewage treatment plants	40 days	Fri 17.03.06	Thu 11.05.06
248	Preparation of O&M manuals for water supply schemes	40 days	Fri 17.03.06	Thu 11.05.06
249	Preparation of O&M manuals for sanitation supply schemes	40 days	Fri 17.03.06	Thu 11.05.06
250	Replacements	8 days	Thu 20.04.06	Mon 01.05.06
251	Replacement of old Infrastructure viz. pipelines, water meters, pumps, locks etc.	8 days	Thu 20.04.06	Mon 01.05.06
252	Reduction of Lost revenue.	8 days	Tue 02.05.06	Thu 11.05.06
253	Reticulation System and Zoning	8 days	Tue 02.05.06	Thu 11.05.06
254	Meters Testing and Replacement	8 days	Tue 02.05.06	Thu 11.05.06

ID	Task Name	Duration	Start	Finish
255	Maintaining Supply and Appropriate Pressures	8 days	Tue 02.05.06	Thu 11.05.06
256	Water Conservation	8 days	Tue 02.05.06	Thu 11.05.06
257	Water consumption recording and balancing.	8 days	Tue 02.05.06	Thu 11.05.06
258	Possitive Displacement testing on Reservoirs	8 days	Tue 02.05.06	Thu 11.05.06
259	Continues maintenance improvements	40 days	Thu 20.04.06	Wed 14.06.06
260	Updating of reticulation drawings on GIS when changes or additons are made to the reticulation infrastructure.	20 days	Thu 20.04.06	Wed 17.05.06
261	Maintenance performance measurement (Quantitative and qualitative delivery)	40 days	Thu 20.04.06	Wed 14.06.06
262	Consolodate and propose a standard Maintenance Planning & Scheduling framework (O&M Manuals to be added at a later stage)	3 days	Fri 12.05.06	Tue 16.05.06
263	Health and Safety	20 days	Wed 29.03.06	Tue 25.04.06
264	Ensure safety plans are in place for all treatment works (Water and Sanitation)	20 days	Wed 29.03.06	Tue 25.04.06
265	Ensure that a Heath and Safety policy is developed	20 days	Wed 29.03.06	Tue 25.04.06
266	Ensure all staff have health and safety equipment	8 days	Wed 29.03.06	Fri 07.04.06
267	Ensure all infrastructure meets safety requirements	8 days	Wed 29.03.06	Fri 07.04.06
268	Ensure all vehicles meet health and safety requirements	8 days	Wed 29.03.06	Fri 07.04.06
269	Ensure safety equipment e.g. shoring is available in the working environment	8 days	Wed 29.03.06	Fri 07.04.06
270	Finalization of Health and Safety	2 days	Wed 26.04.06	Thu 27.04.06
271	Operation systems	14 days	Thu 13.04.06	Tue 02.05.06
272	Use of SCADA on treatment plants to monitor and report of their operation	5 days	Thu 13.04.06	Wed 19.04.06
273	Telemetry system for reporting on water levels in reservoirs, status of pumps, PRV's and specific valves.	5 days	Thu 13.04.06	Wed 19.04.06
274	Telemetry / GPRS systems for monitoring of water sources e.g. borehole water levels.	5 days	Thu 13.04.06	Wed 19.04.06
275	Telemetry system for security purposes.	5 days	Thu 13.04.06	Wed 19.04.06
276	Payroll / Clock card system, logsheets or other	5 days	Thu 13.04.06	Wed 19.04.06
277	Job cards with audit trail	5 days	Thu 13.04.06	Wed 19.04.06
278	Call Centre	14 days	Thu 13.04.06	Tue 02.05.06
297	Communication	7 days	Wed 03.05.06	Thu 11.05.06
298	Car phones	7 days	Wed 03.05.06	Thu 11.05.06
299	Pagers	7 days	Wed 03.05.06	Thu 11.05.06
300	Cell phones	7 days	Wed 03.05.06	Thu 11.05.06
301	Finalization of the Operational System	2 days	Fri 12.05.06	Mon 15.05.06
302	Transportation / Vehicles	62 days	Tue 14.02.06	Wed 10.05.06
303	Hiring of vehicles	20 days	Tue 14.02.06	Mon 13.03.06
304	Excavator (20 ton Approx 100Kw)	20 days	Tue 14.02.06	Mon 13.03.06
305	Low-bed Truck (25 tons)	20 days	Tue 14.02.06	Mon 13.03.06
306	Purchase of vehicles	40 days	Tue 14.02.06	Mon 10.04.06
307	Tipper Tucks (6m ³) for Backfill	40 days	Tue 14.02.06	Mon 10.04.06
308	Trucks (5 ton) Modified for Maintenance	40 days	Tue 14.02.06	Mon 10.04.06
309	Delivery Bakies (1 ton)	40 days	Tue 14.02.06	Mon 10.04.06
310	Water Tankers (20KI)	40 days	Tue 14.02.06	Mon 10.04.06
311	Vacume Tankers (20KI)	40 days	Tue 14.02.06	Mon 10.04.06
312	TLB's	40 days	Tue 14.02.06	Mon 10.04.06
313	Vehicle allocation and utilization control policy	40 days	Tue 14.02.06	Mon 10.04.06
314	Fitting of tracking devices	20 days	Tue 11.04.06	Mon 08.05.06
315	Finalization on Transportation and vehicles	2 days	Tue 09.05.06	Wed 10.05.06
316	Machinery and equipment	32 days	Tue 14.02.06	Wed 29.03.06
317	Hiring of machinery and equipment	10 days	Tue 14.02.06	Mon 27.02.06
318	Machinery and equipment to be specified	10 days	Tue 14.02.06	Mon 27.02.06
319	Purchase of machinery and equipment	30 days	Tue 14.02.06	Mon 27.03.06
320	Wackers	30 days	Tue 14.02.06	Mon 27.03.06
321	Jack hammers	30 days	Tue 14.02.06	Mon 27.03.06
322	Pumps, generators and lights	30 days	Tue 14.02.06	Mon 27.03.06
323	Jetting Machines	30 days	Tue 14.02.06	Mon 27.03.06
324	Rodding Rods	30 days	Tue 14.02.06	Mon 27.03.06
325	Hoses & Jumpers with PRV's	30 days	Tue 14.02.06	Mon 27.03.06
326	Pressure Logging equipment and software	30 days	Tue 14.02.06	Mon 27.03.06
327	Small Tools	30 days	Tue 14.02.06	Mon 27.03.06
328	Shoring	30 days	Tue 14.02.06	Mon 27.03.06
329	Finalization on Machinery and Equipment	2 days	Tue 28.03.06	Wed 29.03.06
330	Security	20 days	Fri 17.03.06	Thu 13.04.06
331	Standardization of locks with master key per Local Municipality	20 days	Fri 17.03.06	Thu 13.04.06

ID	Task Name	Duration	Start	Finish
332	Standard lock for electrical works	20 days	Fri 17.03.06	Thu 13.04.06
333	Standard lock for reticulation infrastructure	20 days	Fri 17.03.06	Thu 13.04.06
334	Report to Manco	4 days	Wed 17.05.06	Mon 22.05.06
335	Report to Infrastructure Committee	4 days	Tue 23.05.06	Fri 26.05.06
336	Information Technology	100 days	Mon 23.01.06	Fri 09.06.06
337	Call Centre	20 days	Mon 23.01.06	Fri 17.02.06
338	Wan Link to LM and Site Offices	20 days	Mon 20.02.06	Fri 17.03.06
339	Fault reporting and tracking Sysyem	20 days	Mon 20.03.06	Fri 14.04.06
340	MOA with LM for IT Support	20 days	Mon 17.04.06	Fri 12.05.06
341	Finance system exports	10 days	Mon 15.05.06	Fri 26.05.06
342	Report to Manco	5 days	Mon 29.05.06	Fri 02.06.06
343	Report to relevant Steering Committee	5 days	Mon 05.06.06	Fri 09.06.06
344	Integration of sectors	20 days	Fri 16.06.06	Thu 13.07.06
345	Systems Integration	20 days	Fri 16.06.06	Thu 13.07.06
346	Integrated Finance Water billing System	20 days	Fri 16.06.06	Thu 13.07.06
347	Centralise and intergrate call centre and fault management centre (Technical, finance, HR and IT)	20 days	Fri 16.06.06	Thu 13.07.06
348	Systems integration into Dims	20 days	Fri 16.06.06	Thu 13.07.06
349	Shared IT Support	20 days	Fri 16.06.06	Thu 13.07.06
350	Report to Manco	20 days	Fri 16.06.06	Thu 13.07.06
351	Report to Exco	2 days	Fri 16.06.06	Mon 19.06.06
352	Letter to all Consumers	2 days	Tue 20.06.06	Wed 21.06.06
353	Operations Infrastructure	18 days	Fri 26.05.06	Tue 20.06.06
354	Finalization of Site Offices	8 days	Fri 26.05.06	Tue 06.06.06
355	Site Offices linked to WAN	8 days	Wed 07.06.06	Fri 16.06.06
356	Report to Manco	2 days	Mon 19.06.06	Tue 20.06.06
357	Project Handover	10 days	Fri 14.07.06	Thu 27.07.06
358	Presentation to all stakeholders	2 days	Fri 14.07.06	Mon 17.07.06
359	Policies and Procedures	2 days	Tue 18.07.06	Wed 19.07.06
360	Press conference	2 days	Thu 20.07.06	Fri 21.07.06
361	Project Sustainability report	2 days	Mon 24.07.06	Tue 25.07.06
362	Reports to all relevant Committees	2 days	Wed 26.07.06	Thu 27.07.06
363	Completion of Project	2 days	Fri 28.07.06	Mon 31.07.06

APPENDIX D

**THE LISTS OF STAFF PROPOSED FOR THE
FUNCTIONING OF THE WSPU AS
DEVELOPED FROM THE MODEL
ORGANISATIONAL STRUCTURE
FRAMEWORK, PER MUNICIPALITY**

STAFFING ARRANGEMENTS IN THE UMSHWATHI BUSINESS UNIT AREA.

UMSHWATHI BUSINESS UNIT AREA (KZ 221)					
POSITIONS AS PROPOSED IN THE FRAMEWORK MODEL	No. OF POSTS REQUIRED	POST AVAILABLE AND OCCUPIED	POST TO BE CREATED	CRITICAL POSTS REQUIRED	POSTS REQUIRED IN SHORT TERM
Sub-Regional Manager	1		1	1	
Superintendent (Urban / Peri Urban)	1	1			
Millwright (Artisan)	1		1		1
Senior Plumber (Water reticulation - urban)	2	1	1	1	
Artisan Plumber (Water reticulation - urban)	1	1			
Senior Plumber (Sewerage reticulation - urban)	1		1	1	
Artisan Plumber (Sewerage Reticulation – urban)	1		1	1	
Forman / Supervisor (Construction – urban)	1	1			
TLB Operator	1		1	1	
Operator (Sewage Treatment Works – urban)	2	2			
Handyman (urban)	1		1		1
Store Bakkie driver (urban)	1		1		1
Stores controller receptionist (urban)	1		1	1	
Truck Driver	1		1		1
Vacuum Tanker driver	1		1	1	
Water Tanker driver	1		1	1	
Artisan assistant	1		1		1
Stores Clerical assistant (urban)	2		2		2
Water meter readers (urban)	2		2	2	
General worker (Water reticulation – urban)	6	5	1		1
General worker (Construction – urban)	4		4		4
General worker (Handyman – urban)	2		2		2
General worker (Sewerage reticulation – urban)	4	4			
General worker (stores – urban)	2		2		2

General Worker (Truck Driver)	1		1		1
General worker (Vacuum Tanker driver)	1		1		1
General worker (Water Tanker driver)	1		1		1
General Workers (Sewage treatment works – urban)	6		6	4	2
Superintendent (Rural)	1	1			
Senior Plumber (Water reticulation - rural)	1	1			
Artisan Plumber (Water reticulation - rural)	2	1	1	1	
Forman / Supervisor (Construction – rural)	1		1		1
Operator (Sewage Treatment Works – rural)	1		1	1	
Operator (Water treatment works – rural)	1	1			
Handyman (rural)	1		1		1
Stores controller receptionist (rural)	16	16			
Water meter readers (rural)	5		5		5
General worker (Water reticulation - rural)	6	2	4	4	
General worker (Construction – rural)	4		4		4
General worker (Handyman – rural)	2		2		2
General worker (stores – rural)	16		16		16
General Workers (Sewage treatment works – rural)	3	1	2	1	1
General Workers (Water treatment works – rural)	3	2	1		1
TOTALS	113	40	73	21	52

ARRANGEMENTS IN THE UMNGENI BUSINESS UNIT AREA.

UMNGENI BUSINESS UNIT AREA (KZ 222)					
POSITIONS AS PROPOSED IN THE FRAMEWORK MODEL	No. OF POSTS REQUIRED	POST AVAILABLE AND OCCUPIED	POST TO BE CREATED	CRITICAL POSTS REQUIRED	POSTS REQUIRED IN SHORT TERM
Sub-Regional Manager	1		1	1	
Superintendent (Urban / Peri Urban)	1		1	1	
Millwright (Artisan)	1		1		1
Senior Plumber (Sewerage reticulation - urban)	1	1			
Senior Plumber (Water reticulation - urban)	3	2	1	1	
Artisan Plumber (Water reticulation - urban)	2	2			
Artisan Plumber (Sewerage Reticulation – urban)	1	1			
Forman / Supervisor (Construction – urban)	1	1			
TLB Operator	1		1	1	
Operator (Sewage Treatment Works – urban)	1		1		1
Operator (Water Treatment Works – urban)	1		1	1	
Handyman (urban)	1		1		1
Store Bakkie driver (urban)	1		1		1
Stores controller receptionist (urban)	1		1	1	
Truck Driver	1		1	1	
Vacuum Tanker driver	1	1			
Water Tanker driver	1		1	1	
Artisan assistant	1		1		1
Stores Clerical assistant (urban)	2		2		2
Water meter readers (urban)	3		3	2	1
General worker (Water reticulation – urban)	10	8	2		2
General worker (Construction – urban)	4	4			
General worker (Handyman – urban)	2		2		2
General worker (Sewerage reticulation – urban)	4		4	3	1
General worker (stores – urban)	2		2		2
General Worker (Truck Driver)	1		1		1

General worker (Vacuum Tanker driver)	1	1			
General worker (Water Tanker driver)	1		1		1
General Workers (Sewage treatment Pump Stations – urban)	4	1	3	3	
General Workers (Sewage treatment works – urban)	9		9		9
General Workers (Water treatment works – urban)	2		2	1	1
TOTALS	66	22	44	17	27

TABLE 14: STAFFING POSITIONS AS REFLECTED IN THE MODEL FRAMEWORK COMPARED TO THE CURRENT STAFFING ARRANGEMENTS IN THE MPOFANA BUSINESS UNIT AREA.

MPOFANA BUSINESS UNIT AREA (KZ 223)					
POSITIONS AS PROPOSED IN THE FRAMEWORK MODEL	No. OF POSTS REQUIRED	POST AVAILABLE AND OCCUPIED	POST TO BE CREATED	CRITICAL POSTS REQUIRED	POSTS REQUIRED IN SHORT TERM
Sub-Regional Manager	1	1			
Superintendent (Urban / Peri Urban)	1	1			
Millwright (Artisan)	1		1		1
Senior Plumber (Sewerage reticulation - urban)	1		1	1	
Senior Plumber (Water reticulation - urban)	2	1	1	1	
Artisan Plumber (Water reticulation - urban)	1	1			
Artisan Plumber (Sewerage Reticulation – urban)	1		1	1	
Forman / Supervisor (Construction – urban)	1	1			
TLB Operator	1		1	1	
Operator (Sewage Treatment Works – urban)	1	1			
Operator (Water Treatment Works – urban)	1		1	1	
Handyman (urban)	1		1		1
Store Bakkie driver (urban)	1		1		1
Stores controller receptionist (urban)	1		1	1	
Truck Driver	1		1		1
Vacuum Tanker driver	1	1			
Water Tanker driver	1		1	1	
Artisan assistant	1		1		1
Stores Clerical assistant (urban)	2		2		2
Water meter readers (urban)	2		2	2	
General worker (Water reticulation – urban)	6	6			
General worker (Construction – urban)	4	3	1		1
General worker (Handyman – urban)	2		2		2

General worker (Sewerage reticulation – urban)	4		4	3	1
General worker (stores – urban)	2		2		2
General Worker (Truck Driver)	1		1		1
General worker (Vacuum Tanker driver)	1	1			
General worker (Water Tanker driver)	1		1		1
General Workers (Sewage treatment works – urban)	3	3			
General Workers (Water treatment works – urban)	3	3			
Superintendent (Rural)	1		1		1
Senior Plumber (Water reticulation - rural)	1		1		1
Artisan Plumber (Water reticulation - rural)	1		1	1	
Handyman (rural)	1		1		1
General worker (Water reticulation - rural)	4		4	2	2
General worker (Handyman – rural)	2		2		2
TOTALS	60	23	37	15	22

TABLE 15: STAFFING POSITIONS AS REFLECTED IN THE MODEL FRAMEWORK COMPARED TO THE CURRENT STAFFING ARRANGEMENTS IN THE IMPENDLE BUSINESS UNIT AREA.

IMPENDLE BUSINESS UNIT AREA (KZ 224)					
POSITIONS AS PROPOSED IN THE FRAMEWORK MODEL	No. OF POSTS REQUIRED	POST AVAILABLE AND OCCUPIED	POST TO BE CREATED	CRITICAL POSTS REQUIRED	POSTS REQUIRED IN SHORT TERM
Sub-Regional Manager	1		1	1	
Superintendent (Urban / Peri Urban)	1		1		1
Millwright (Artisan)	1		1		1
Senior Plumber (Water reticulation - urban)	1		1	1	
Artisan Plumber (Water reticulation - urban)	1				
TLB Operator	1		1		1
Handyman (urban)	1	1			
Store Bakkie driver (urban)	1		1	1	
Stores controller receptionist (urban)	1		1	1	
Truck Driver	1		1	1	
Vacuum Tanker driver	1		1		1
Water Tanker driver	1		1	1	
Artisan assistant	1		1		1
Stores Clerical assistant (urban)	1		1	1	
Water meter readers (urban)	1		1	1	
General worker (Water reticulation – urban)	4	2	2		2
General worker (Handyman – urban)	2		2		2
General worker (stores – urban)	2		2		2
General Worker (Truck Driver)	1		1		1
General worker (Vacuum Tanker driver)	1		1		1
General worker (Water Tanker driver)	1		1		1
Senior Plumber (Water reticulation - rural)	1		1	1	

Artisan Plumber (Water reticulation - rural)	2		2	1	1
Forman / Supervisor (Construction – rural)	1		1	1	
Operator (Water treatment works – rural)	1	1			
Handyman (rural)	1		1		1
Stores controller receptionist (rural)	1	1			
Water meter readers (rural)	1		1		1
General worker (Water reticulation - rural)	6	2	4	4	
General worker (Construction – rural)	4		4	2	2
General worker (Handyman – rural)	2		2		2
General worker (stores – rural)	1		1		1
General Workers (Water treatment works – rural)	3		3		3
TOTALS	50	7	42	17	25

TABLE 16: STAFFING POSITIONS AS REFLECTED IN THE MODEL FRAMEWORK COMPARED TO THE CURRENT STAFFING ARRANGEMENTS IN THE MKHAMBATHINI BUSINESS UNIT AREA.

MKHAMBATHINI BUSINESS UNIT AREA (KZ 226)					
POSITIONS AS PROPOSED IN THE FRAMEWORK MODEL	No. OF POSTS REQUIRED	POST AVAILABLE AND OCCUPIED	POST TO BE CREATED	CRITICAL POSTS REQUIRED	POSTS REQUIRED IN SHORT TERM
Sub-Regional Manager	1		1		1
Superintendent (Urban / Peri Urban)	1		1	1	
Senior Plumber (Sewerage reticulation - urban)	1		1		1
Senior Plumber (Water reticulation - urban)	1		1	1	
Artisan Plumber (Water reticulation - urban)	1	1			
Forman / Supervisor (Construction – urban)	1		1		1
TLB Operator	1		1		1
Operator (Sewage Treatment Works – urban)	1		1	1	
Handyman (urban)	1		1		1
Store Bakkie driver (urban)	1		1		1
Stores controller receptionist (urban)	1		1		1
Truck Driver	1		1		1
Vacuum Tanker driver	1		1		1
Water Tanker driver	1		1		1
Stores Clerical assistant (urban)	1		1		1
Water meter readers (urban)	1		1	1	
General worker (Water reticulation – urban)	4		4	4	
General worker (Construction – urban)	4		4		4
General worker (Handyman – urban)	2		2		2
General worker (Sewerage reticulation – urban)	2		2	2	
General worker (stores – urban)	2		2		2
General Worker (Truck Driver)	1		1		1

General worker (Vacuum Tanker driver)	1		1		1
General worker (Water Tanker driver)	1		1		1
General Workers (Sewage treatment works – urban)	2		2		2
Superintendent (Rural)	1		1		1
Senior Plumber (Water reticulation - rural)	1		1		1
Artisan Plumber (Water reticulation - rural)	1		1	1	
Forman / Supervisor (Construction – rural)	1		1		1
Handyman (rural)	1		1		1
Stores controller receptionist (rural)	4	1	3		3
Water meter readers (rural)	2		2		2
General worker (Water reticulation - rural)	4		4		4
General worker (Construction – rural)	4		4		4
General worker (Handyman – rural)	2		2		2
General worker (stores – rural)	4		4		4
Water Bailiffs (rural)	27	27			
TOTALS	87	29	58	11	47

TABLE 17: STAFFING POSITIONS AS REFLECTED IN THE MODEL FRAMEWORK COMPARED TO THE CURRENT STAFFING ARRANGEMENTS IN THE RICHMOND BUSINESS UNIT AREA.

RICHMOND BUSINESS UNIT AREA (KZ 227)					
POSITIONS AS PROPOSED IN THE FRAMEWORK MODEL	No. OF POSTS REQUIRED	POST AVAILABLE AND OCCUPIED	POST TO BE CREATED	CRITICAL POSTS REQUIRED	POSTS REQUIRED IN SHORT TERM
Sub-Regional Manager	1	1			
Superintendent (Urban / Peri Urban)	1	1			
Millwright (Artisan)	1		1		1
Senior Plumber (Sewerage reticulation - urban)	1		1	1	
Senior Plumber (Water reticulation - urban)	1		1	1	
Artisan Plumber (Water reticulation - urban)	2		2	1	1
Artisan Plumber (Sewerage Reticulation – urban)	1		1		1
Forman / Supervisor (Construction – urban)	1		1		1
TLB Operator	1		1	1	
Operator (Sewage Treatment Works – urban)	1		1	1	
Operator (Water Treatment Works – urban)	1	1			
Handyman (urban)	1		1		1
Store Bakkie driver (urban)	1	1			
Stores controller receptionist (urban)	1	1			
Truck Driver	1		1		1
Vacuum Tanker driver	1		1	1	
Water Tanker driver	1		1	1	
Artisan assistant	1		1		1
Stores Clerical assistant (urban)	2	2			
Water meter readers (urban)	2	1	1	1	
General worker (Water reticulation – urban)	6	6			
General worker (Construction – urban)	4	3	1		1
General worker (Handyman – urban)	2		2		2

General worker (Sewerage reticulation – urban)	4	2	2		2
General worker (stores – urban)	2		2		2
General Worker (Truck Driver)	1		1		1
General worker (Vacuum Tanker driver)	1		1		1
General worker (Water Tanker driver)	1		1		1
General Workers (Sewage treatment works – urban)	3	2	1	1	
General Workers (Water treatment works – urban)	4	4			
Operator (Water Treatment Works – urban)	1	1			
Superintendent (Rural)	1		1		1
Senior Plumber (Water reticulation - rural)	1		1	1	
Artisan Plumber (Water reticulation - rural)	2	1	1		1
Forman / Supervisor (Construction – rural)	1		1		1
Handyman (rural)	1		1		1
Stores controller receptionist (rural)	1		1		1
Water meter readers (rural)	2	1	1		1
General worker (Water reticulation - rural)	6	3	3	2	1
General worker (Construction – rural)	4		4		4
General worker (Handyman – rural)	2	2			
General worker (stores – rural)	1		1		1
TOTALS	74	33	41	12	29

TABLE 18: STAFFING POSITIONS AS REFLECTED IN THE MODEL FRAMEWORK COMPARED TO THE CURRENT STAFFING ARRANGEMENTS IN THE UMGUNGUNDLOVU DISTRICT MUNICIPALITY – HEAD OFFICE.

UMGUNGUNDLOVU DISTRICT MUNICIPALITY – HEAD OFFICE (KZ 22)					
POSITIONS AS PROPOSED IN THE FRAMEWORK MODEL	No. OF POSTS REQUIRED	POST AVAILABLE AND OCCUPIED	POST TO BE CREATED	CRITICAL POSTS REQUIRED	POSTS REQUIRED IN SHORT TERM
Executive Manager Operations and Management	1		1	1	
Chief Buyer	1		1	1	
Technician (Civil Eng.)	1		1		1
Millwright (Artisan)	1		1		1
Telemetry Controller	2		2	2	
Admin Officer	1		1	1	
Admin Officer – Fleet Control	2		2	1	1
Buyer	3		3	3	
Central Stores controller	1		1	1	
Control Room Supervisors	2		2	2	
ISD Officer	1		1	1	
Bakkie driver	1		1	1	
Control Room Job dispatches	4		4	4	
Stores clerks	3		3	2	1
Control Room Call Receiver	12	12			
Artisan assistant	1		1		1
General worker (stores – urban)	3		3	2	1
TOTALS	40	12	28	22	6

APPENDIX E

**THE STRUCTURED QUESTIONNAIRE
DEVELOPED FOR THE INTERVIEWS**

Institution: _____				
Department: _____				
Name: _____				
Occupation & Designation: _____				
	Comments	Weakness	Strength	Opportunity
Organisational Structure:				
1	Do you find your current organisational structure acceptable?			
2	Are the current staff numbers able to service both the urban and rural areas satisfactorily?			
3	Current number of Staff and designations See attached schedule to be completed.			
4	Is the structure suitable for good customer service?			
5	What delegation of authority exists?			
6	Is the structure more flattened or hierarchical?			
7	Is there flexible supervision (coaching rather than controlling)?			
8	Is the structure optimal for achieving the objectives and functional to purpose?			
9	Is there competitiveness between employees?			
10	Is the span of control wide or narrow?			
11	How good is the coordination and collaboration between staff in the department?			
12	What is the culture of the department?			
13	Are there mechanisms to educate employees, encouraging multi-skilling?			
14	Do any of the staff work on a performance based reward system?			
15	Do you approve of the proposed departmental structure?			
16	In your opinion what can be omitted and what needs to be added?			
17	How does the proposed structure compare to the existing structure?			

Infrastructure						
1	Is the existing infrastructure in a good state of repair?					
Water treatment works						
Water reticulation						
Sewerage treatment works						
Sewerage reticulation						
2	Do you foresee much replacement in the infrastructure in the near future?					
3	Is the existing water reticulation sized adequately for the accommodation of the increase in development in the area?					
4	Is the existing sewerage reticulation sized adequately for the accommodation of the increase in development in the area?					
5	Is there an estimated length of water reticulation pipework?					
6	Is there an estimated length of sewerage reticulation pipework?					
7	How many sewerage pump stations exist?					
8	How many sewage treatment works exist?					
9	How many water treatment works exist?					
10	How many consumers are there?					
Plant, equipment and materials						
1	What Plant, equipment and materials do you utilize?					
2	See attached schedules of Plant, equipment and materials?					
3	Who are your suppliers of materials?					
4	Who do you contract when requiring Plant e.g. TLB's?					
5	Who does your engineering work e.g. making up of specials?					
Operations						
1	What are the working hours of Staff?					
2	Number of water bursts per month?					
3	Number of sewerage blockages per month?					
4	How do you monitor the water supply provision?					

5	How do you communicate with staff?					
6	Cell phone?					
7	Radio's?					
8	paggers?					
9	Does the municipality comply with DWAF regulations?					
10	How does a water burst and related matters get reported?					
11	How are jobs allocated to staff?					
12	How does one monitor overtime?					
13	Do you have security guards?					
14	Do you have a uniform lock and key for the operational infrastructure?					
15	Which department reads the meters?					
16	Is the meter reading successful?					
17	Would it be better to contract this service out?					
18	Who calls for quotations?					
19	What is the turn-around time in receiving orders?					
20	How often do your order chemicals?					
21	Who are your chemical suppliers?					
22	What external services providers do you utilize?					
23	Electrical?					
24	Pump repairs?					
25	Other?					
26						
27						
28						
Reporting Information Systems						
1	What information systems exist?					
2	What computer hardware exists?					
3	Does the system interface well with other municipal information systems?					
4	Does the system support risk management, predictive modelling, optimized decision making, financial modelling and works management?					
5	Does it enable feedback to the workers?					

6	Does the system match the organisational structure and operation?					
7	Is there a good interface, creating good interaction between the customer, reporting station, workforce and business partners?					
8	Does the system cater for future increased size and complexity of infrastructural networks and operational procedures?					
9	Does the system enable one to collect data for reporting and financial planning so as to optimize and provide justification for the renewal of infrastructure and capital investment programmes?					
10	Can the system operate over a range of hardware platforms and over a range of industry standard databases?					
11	Is the system enabled for flexible report writing?					
12	Do staff exist that can manage and maintain the system?					
Technical Information systems						
1	What electronic reporting mechanisms exist?					
2	Do you have a telemetry system?					
3	What type of telemetry system?					
4	What infrastructure do you receive information from?					
5	Do you utilize a SCADA package?					
6	If so What type?					
7	Do you make use of external service providers?					

What are the strengths?

What are the weaknesses?

What are the opportunities?

That are the threats?

EQUIPMENT

ITEM	DESCRIPTION	OTHER DESCRIPTION	No. TO BE TRANSFERRED
1	GEOPHONES		
2	BATERIES		
3	F / HYDRANT COUPLING		
4	RED ELBOW, HYDRANT COUPLING		
5	ZONE DIVIDER CAP		
6	FIRE HOSE		
7	PRV JUMPERS		
8	STRAIGHT JUMPERS		
9	PIPE DRILLING MACHINE (¾" - 1½")		
10	LOGGERS (PRESSURE AND FLOW)		
11	REED SWITCHES		
12	LONG GWALA BAR		
13	SHORT GWALA BAR		
14	MANHOLE COVER OPENERS		
15	EXTENTION CORDS		
16	VALVE KEY - LONG		
17	VALVE KEY - STANDARD		
18	VALVE KEY EXTENSION		
19	RODDING RODS		
20	PIPE & CABLE LOCATOR		
21	PIPE & CABLE LOCATOR (Model PM 480)		
22	FLOOD LIGHTING RUN OFF GENERATOR		
23	SHORING		
24	HOSES		
25			

MACHINERY

ITEM	DESCRIPTION	OTHER DESCRIPTION	No. TO BE TRANSFERRED
1	ANGLE GRINDER		
2	BRUSH CUTTERS		
3	DRILLING MACHINE (CONVENTIONAL)		
5	ELECTRIC BREAKER		
6	GENERATOR - 2KVA		
7	GENERATOR - 5KVA		
8	GENERATOR-BREAKER		
9	HIGH PRESSURE CLEANING MACHINE		
10	LAWNMOWER		
11	MECHANICAL HORSE		
12	MOBILE COMPRESSOR		
13	PNEUMATIC PUMPS		
14	PNEUMATIC JACK HAMMER (PAVING BREAKER)		
15	SMALL PUMP 2 INCH		
16	PUMP 3-4 INCH		
17	PUMP TRASH 50MM HOMOLITE		
18	RAMMER WEBBER		
19	SKILL SAW		
20	TAR CUTTER		
21	WELDING MACHINE		
22	JETTING MACHINES		
23			
24			
25			
26			
27			
28			
29			
30			

PLANT

ITEM	DESCRIPTION	OTHER DESCRIPTION	No. TO BE TRANSFERRED
1	SUDAN CAR		
2	MOBILE COMPRESSOR		
3	MOBILE GENERATOR		
4	TRAILER		
5	PANEL VAN		
6	PANEL VAN 1 TON		
7	PANEL VAN 3 TON		
8	PICK UP		
9	PICK UP WITH DIFF		
10	PICK UP WITH CANOPY+DIFF		
11	4X4 PICK UP		
12	VAN 2 TON, CANTER		
13	TRUCK 2 TON		
14	MOBILE WORKSHOP - 5 TON		
15	TIPPER 6 TON OR OTHER		
16	TIPPER GRAB TRUCK		
17	TLB		
18	FRONT END LOADER		
19	EXCAVATOR		
20	LOW-BED TRUCK		
21	WATER TANKER		
22	VACUME TANKER		
23			
24			
25			
26			

APPENDIX F

THE SUMMARY OF THE RESULTS OF THE STRUCTURED INTERVIEWS

Organisational Structure:

- 1 Do you find your current organisational structure acceptable?
- 2 Are the current staff numbers able to service both the urban and rural
Current number of Staff and designations
- 3 See attached schedule to be completed.
- 4 Is the structure suitable for good customer service?
- 5 What delegation of authority exists?
- 6 Is the structure more flattened or hierarchical?
- 7 Is there flexible supervision (coaching rather than controlling)?
- 8 Is the structure optimal for achieving the objectives and functional to
- 9 Is there competitiveness between employees?
- 10 Is the span of control wide or narrow?
- 11 How good is the coordination and collaboration between staff in the
- 12 What is the culture of the department?
- 13 Are there mechanisms to educate employees, encouraging multi-skilling?
- 14 Do any of the staff work on a performance based reward system?
- 15 Do you approve of the proposed departmental structure?
- 16 In your opinion what can be omitted and what needs to be added?
- 17 How does the proposed structure compare to the existing structure?

	Weaknes	Strength	Opportu	Threat	Weaknes	Strength	Opportu	Threat	Weaknes	Strength	Opportu	Threat	Weaknes	Strength	Opportu	Threat	Weaknes	Strength	Opportu	Threat	Weaknes	Strength	Opportu	Threat												
1	5				5				3					4				4			1				5				5							
2	5				5									4				4			2				5				5							
3	5				5				4					3				4			5				5				5							
4	5				5				3					5				4			5				5				5							
5	5				5				4					4				1			2				5				2							
6	5				5				4					4				3			4				5				2							
7		5			3				4					3				4			3				4				3							
8	5								3					4				3			4				4				4							
9	3								3					4				2			3				3				4							
10	4								3					3				3			3				3				3							
11	4				4	5			4					5				3	4		3				3				3							
12	4				4				5					5				3			4				3				3							
13	5				2				3					2				3			5				4				3							
14	5				3				4					5				5			5				5				4							
15	5	5			4	4			4	4				4	4			4	4		5				4	4			4	4						
16	5	5			4	4			4	4				4	4			1	4	4	4				1	5	4		4	4						
17		5			4	5			4	4				4	4			5	4		5	5			5	5			5	4						
Infrastructure																																				
18	5																																			
19									2					5				5	5		2															
20									4					4				4	3		3				3											
21									4					5				4						3												
22									3					4				4						2												
23	2								4					4				4			4	4			5			3								
24									3					5				3			4				2											
25									3					3	4						3															
26																		4																		
27																		4	4																	
28									5												5															
29									4												5															
30									4												4															
31														5																						
Plant, equipment and materials																																				
What Plant, equipment and materials do you utilize?																																				
32									4					2				4			4				3											
33									4									4			4				3											
34									4									5			4				3											
35									4											4				3												

APPENDIX G

**THE FINAL PROPOSALS IN TERMS OF
ORGANISATIONAL STRUCTURE AND THE
NUMBERS OF STAFF PROPOSED FOR THE
ESTABLISHMENT OF THE WSPU, PER
LOCAL BUSINESS UNIT**

PROPOSED WATER & SANITATION SERVICES

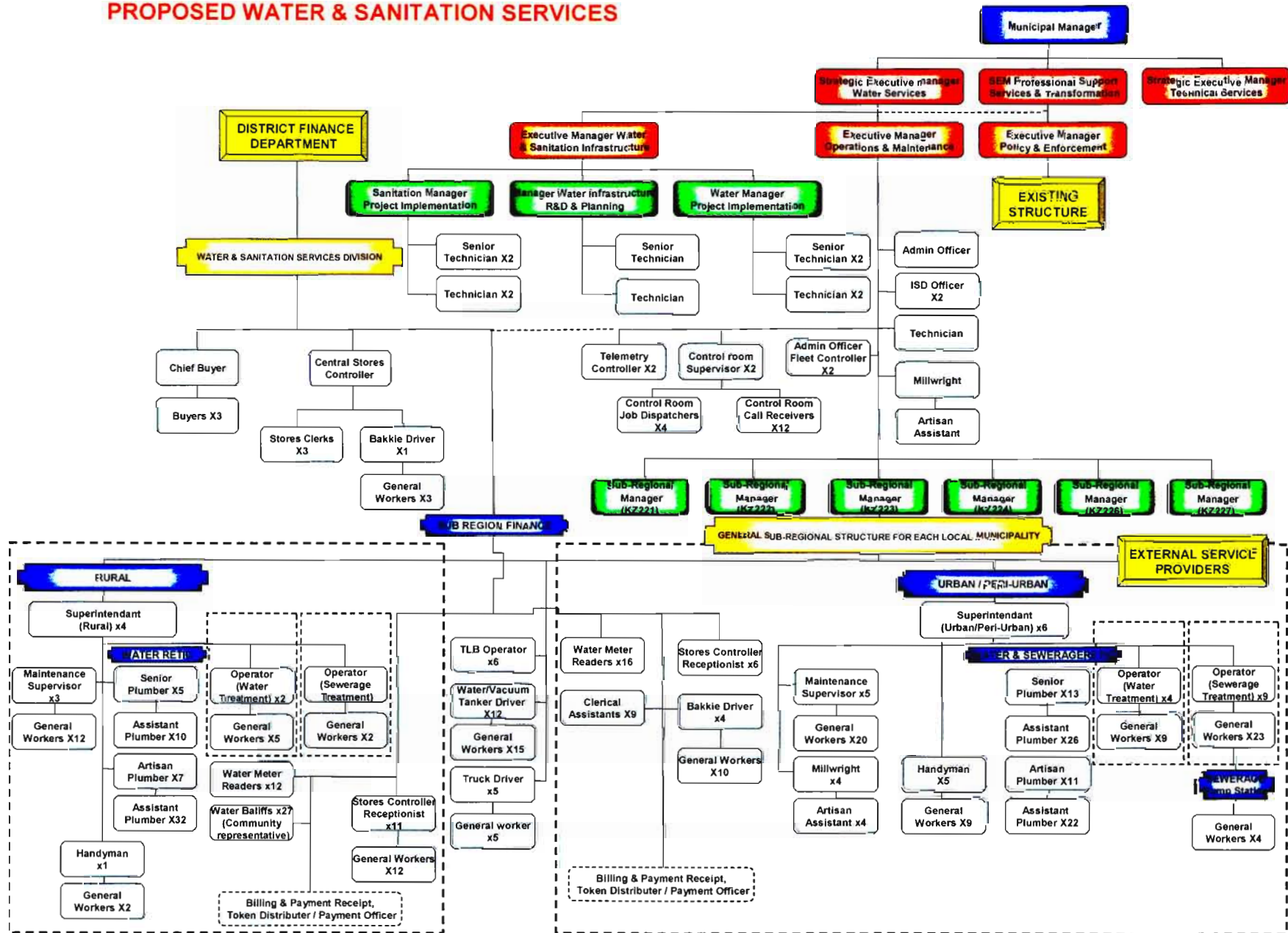


TABLE 31: REVISED STAFFING NUMBERS FOR THE UMSHWATHI BUSINESS UNIT AREAS.

Umschwathi Local Municipality – Current versus Proposed Staff complement					
Location	Designation	Current No.	Proposed Number	New Proposal	Comments
	Sub-Regional Manager		1	1	Required
Urban	Superintendent (Urban / Peri Urban)	1	1	1	Required
	Millwright (Artisan)		1	1	Required
	Senior Plumber (Water reticulation - urban)	1	2	2	Required
	Artisan Plumber (Water reticulation - urban)	1	1	1	Required
	Artisan Plumber (Sewerage Reticulation – urban)		1	1	Required
	Artisan Plumber (Sewerage Reticulation – urban)		1	1	Required
	Forman / Supervisor (Construction – urban)	1	1	1	Required (Change construction to maintenance)
	TLB Operator		1	1	Required (Multiskill as a truck driver)
	Operator (Sewage Treatment Works – urban)	2	2	2	Required
	Truck Driver		1	1	Required
	Handyman (urban)		1	1	Required
	Water Tanker driver		1	1	Required (Multi-skill as TLB operator)
	Vacuum Tanker driver		1	1	Required (Multi-skill as TLB operator)
	Stores controller receptionist (urban)		1	1	Required
	Store Bakkie driver (urban)		1	1	Required
	Artisan assistant		1	1	Required
	Stores Clerical assistant (urban)		2	1	Required (Reduce to 1)
	Water meter readers (urban)		2	2	Required
	General worker (Water reticulation – urban)	5	6	6	Required (Change Name)
	General worker (Construction – urban)		4	4	Required (No Distiguish between urban & Rural)
	General worker (Handyman – urban)		2	2	Required
	General worker (Sewerage reticulation – nrban)	4	4	4	Required (Change Name)
	General worker (stores – urban)		2	2	Required
	General Worker (Truck Driver)		1	1	Required
	General worker (Vacuum Tanker driver)		1	2	Required (Increase to 2)
	General worker (Water Tanker driver)		1	1	Required
	General Workers (Sewage treatment works – urban)		6	6	Required
Rural	Superintendent (Rural)	1	1	1	Required
	Senior Plumber (Water reticulation - rural)	1	1	1	Required
	Artisan Plumber (Water reticulation - rural)	1	2	2	Required
	Forman / Supervisor (Construction – rural)		1	1	Required
	Operator (Sewage Treatment Works – rural)		1	1	Required
	Operator (Water treatment works – rural)	1	1	1	Required
	Handyman (rural)		1	1	Required
	Stores controller receptionist (rural)	16	16	16	Required
	Water meter readers (rural)		5	5	Required
	General worker (Water reticulation - rural)	2	6	6	Required (Change Name)
	General worker (Construction – rural)		4	4	Required
	General worker (Handyman – rural)		2	2	Required
	General worker (stores – rural)		16	16	Required
	General Workers (Sewage treatment works – rural)	1	3	2	Required (Reduce to 2)
	General Workers (Water treatment works – rural)	2	3	2	Required (Reduce to 2)
	Total number of staff	40	113	111	

FIGURE 21: THE FINAL PROPOSED STAFFING STRUCTURE OF THE WSPU TO BE UTILISED FOR THE UMSHWATHI BUSINESS UNIT

**PROPOSED WATER & SANITATION SERVICES
UMSHWATHI LOCAL MUNICIPALITY (KZ221)**

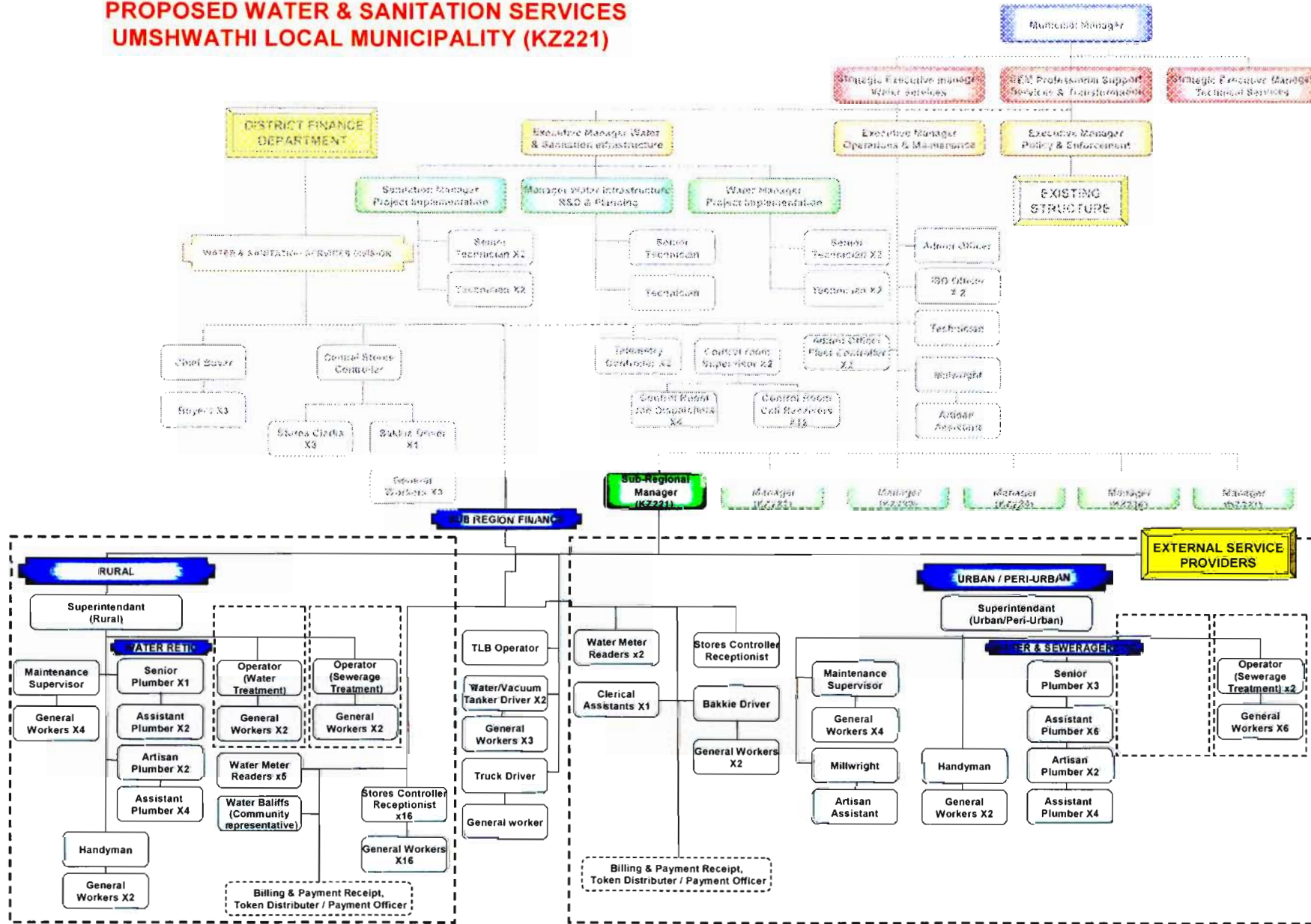


FIGURE 22: THE FINAL PROPOSED STAFFING STRUCTURE OF THE WSPU TO BE UTILISED FOR THE uMNGENI BUSINESS UNIT

**PROPOSED WATER & SANITATION SERVICES
uMNGENI LOCAL MUNICIPALITY (KZ222)**

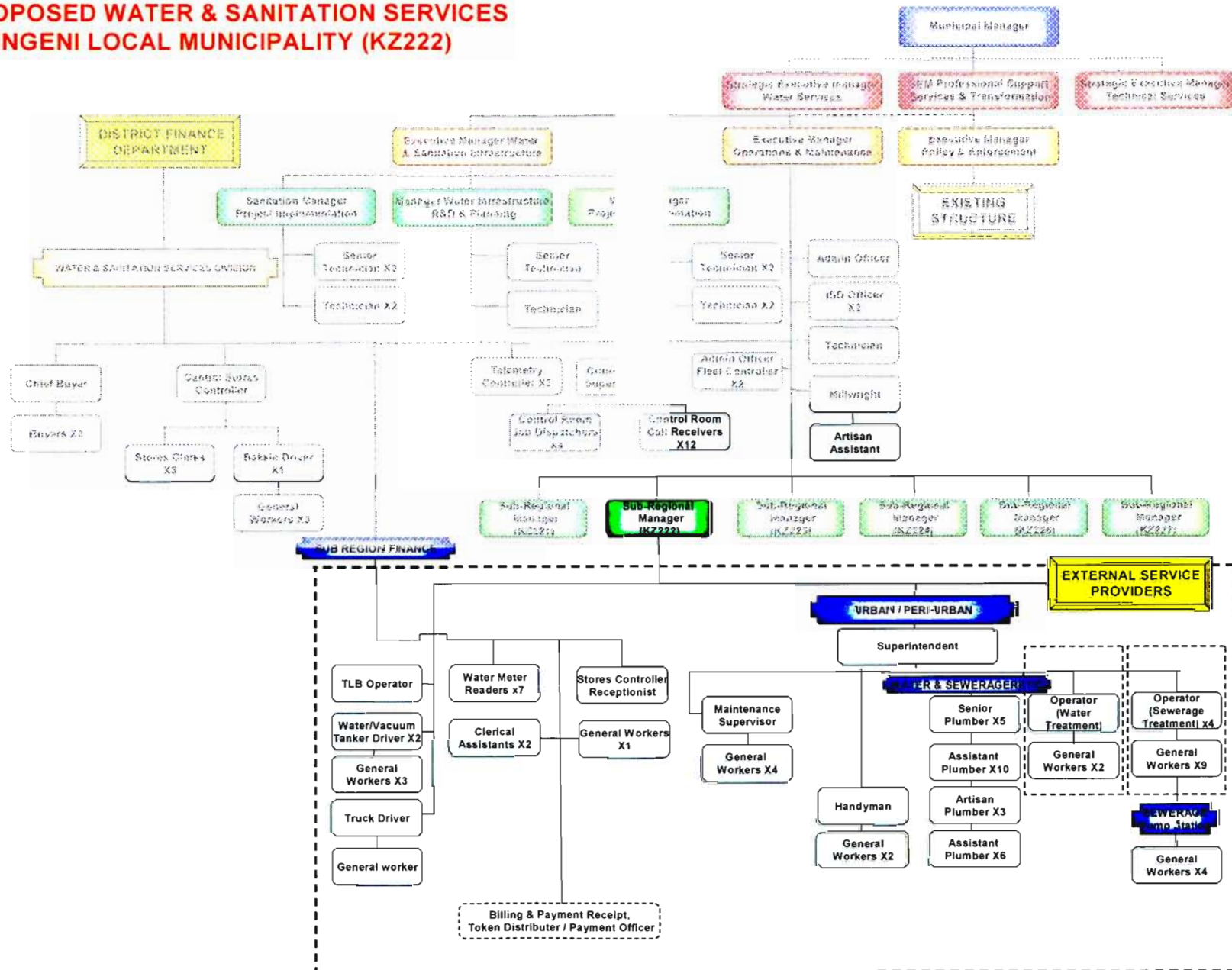


FIGURE 23: THE FINAL PROPOSED STAFFING STRUCTURE OF THE WSPU TO BE UTILISED FOR THE MPOFANA BUSINESS UNIT

**PROPOSED WATER & SANITATION SERVICES
MPOFANA LOCAL MUNICIPALITY (KZ223)**

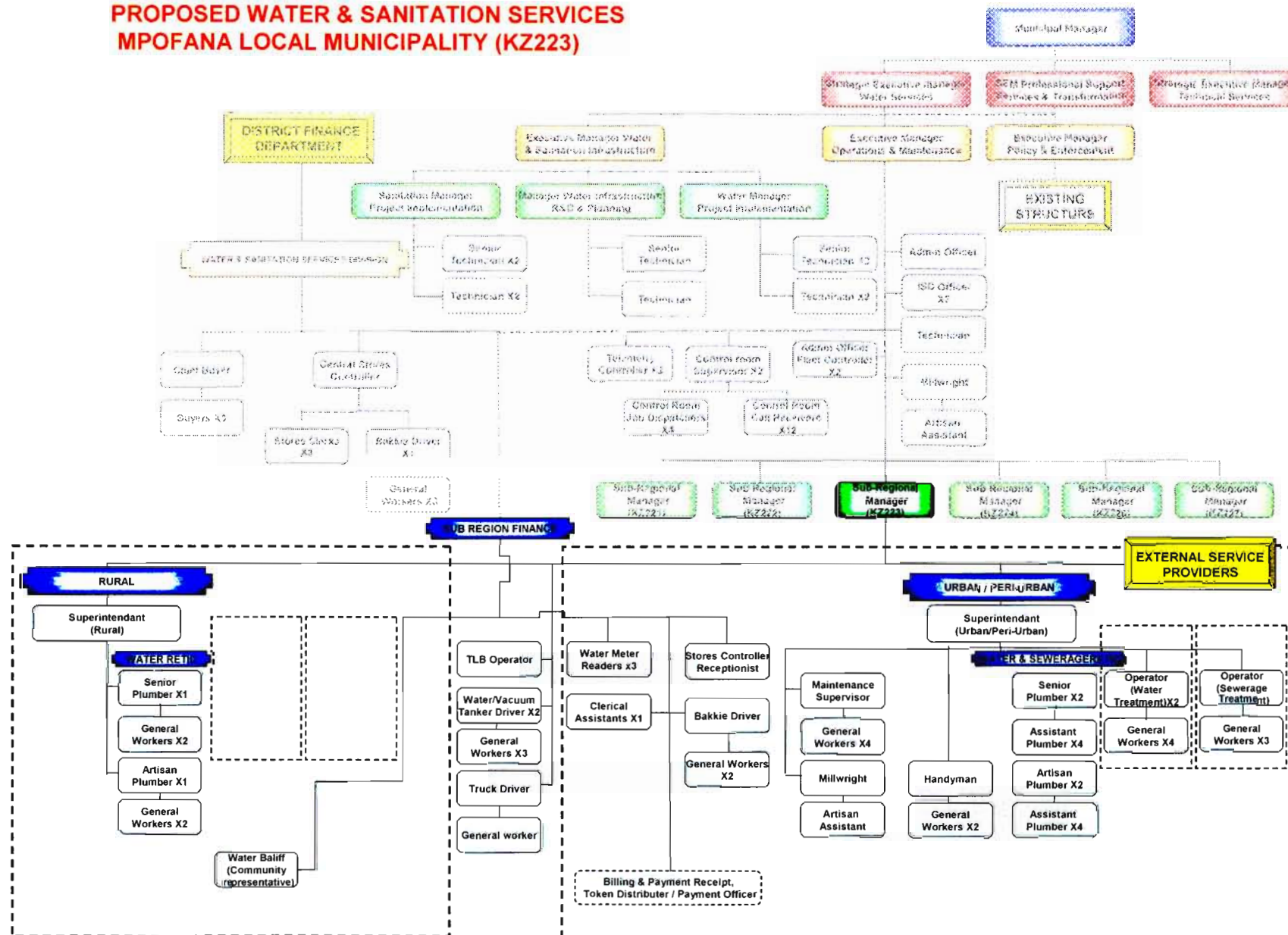


FIGURE 24: THE FINAL PROPOSED STAFFING STRUCTURE OF THE WSPU TO BE UTILISED FOR THE IMPENDLE BUSINESS UNIT

**PROPOSED WATER & SANITATION SERVICES
IMPENDLE LOCAL MUNICIPALITY (KZ224)**

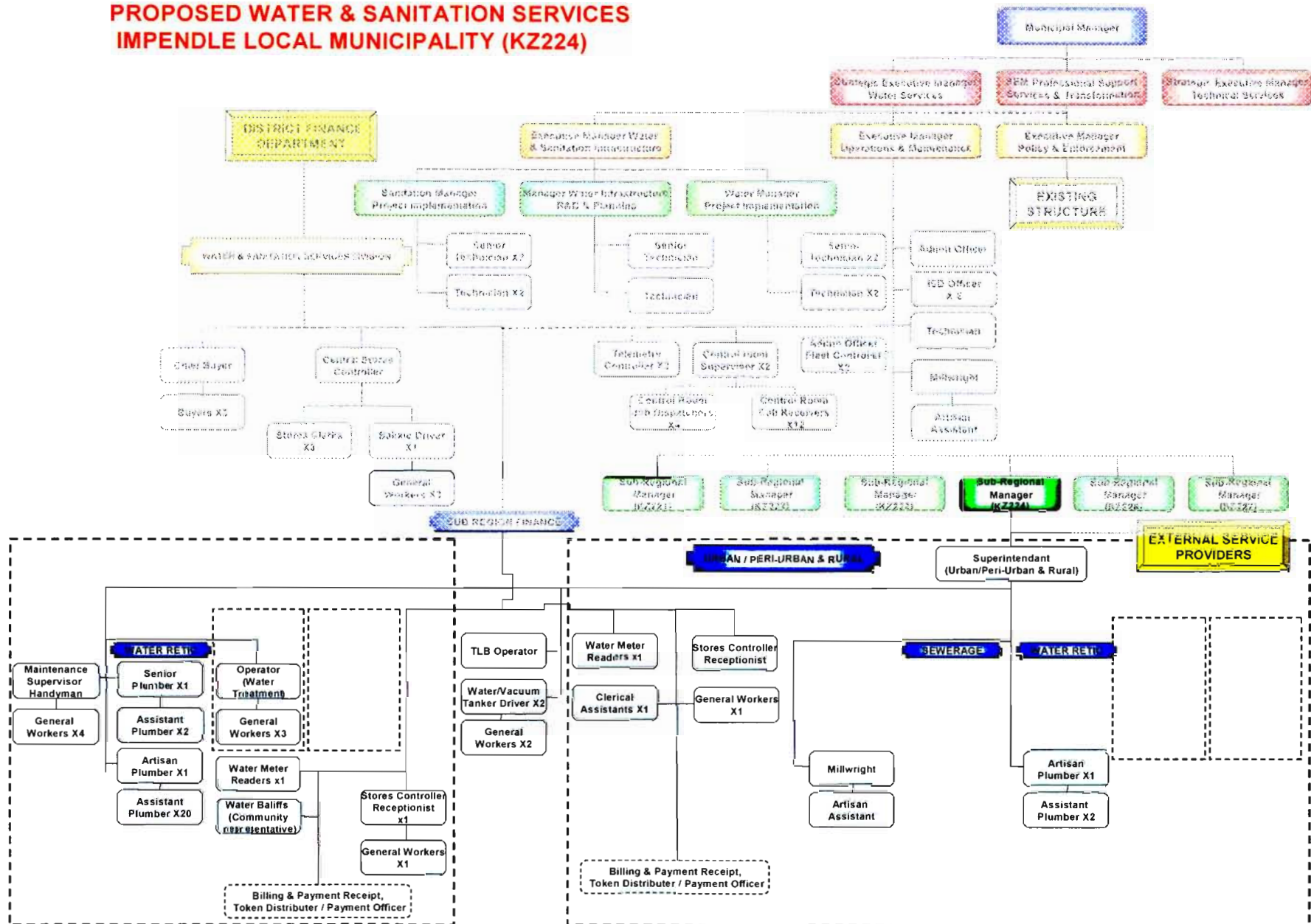


FIGURE 25: THE FINAL PROPOSED STAFFING STRUCTURE OF THE WSPU TO BE UTILISED FOR THE MKHAMBATHINI BUSINESS UNIT

**PROPOSED WATER & SANITATION SERVICES
MKHAMBATHINI LOCAL MUNICIPALITY (KZ226)**

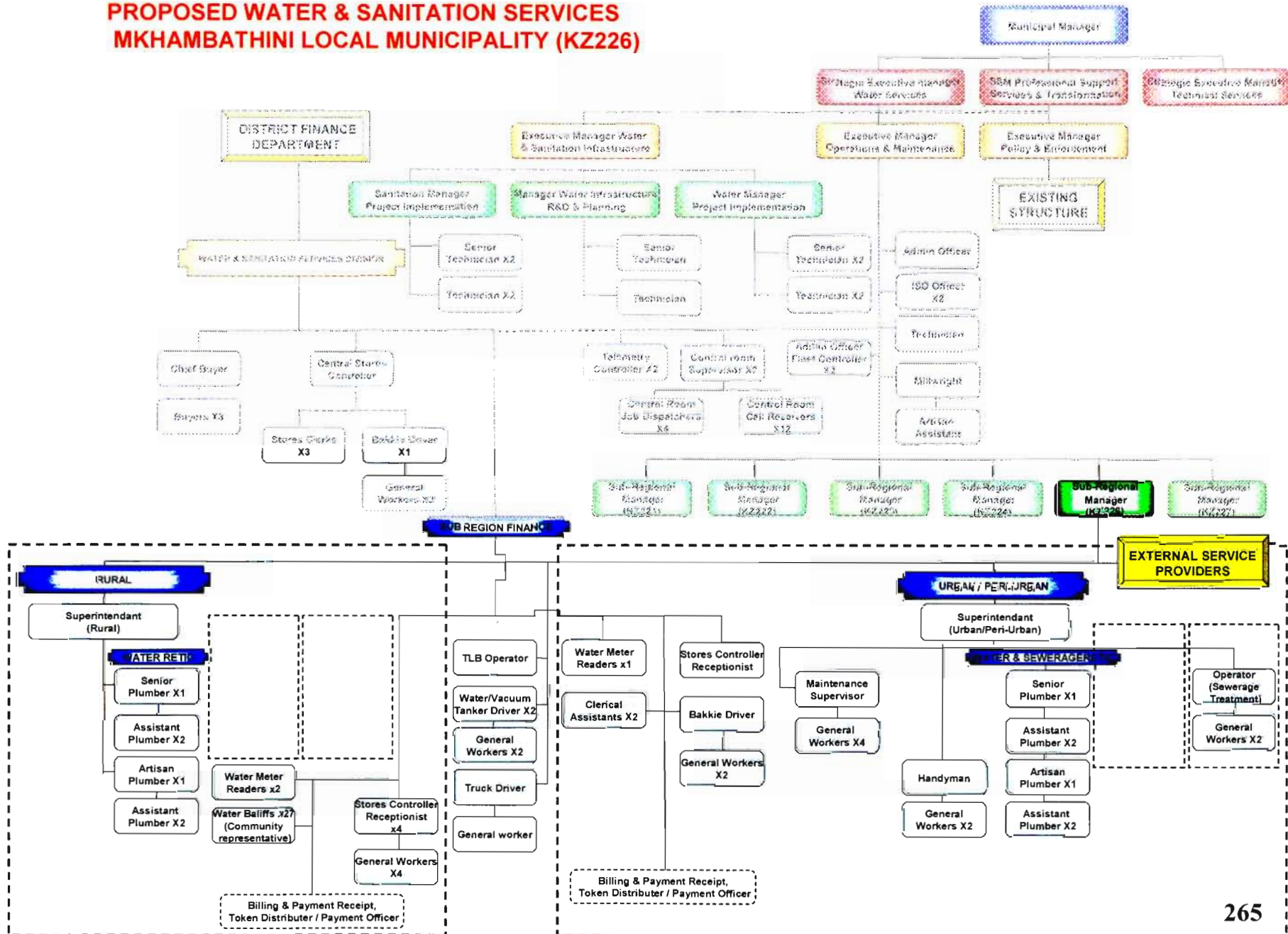
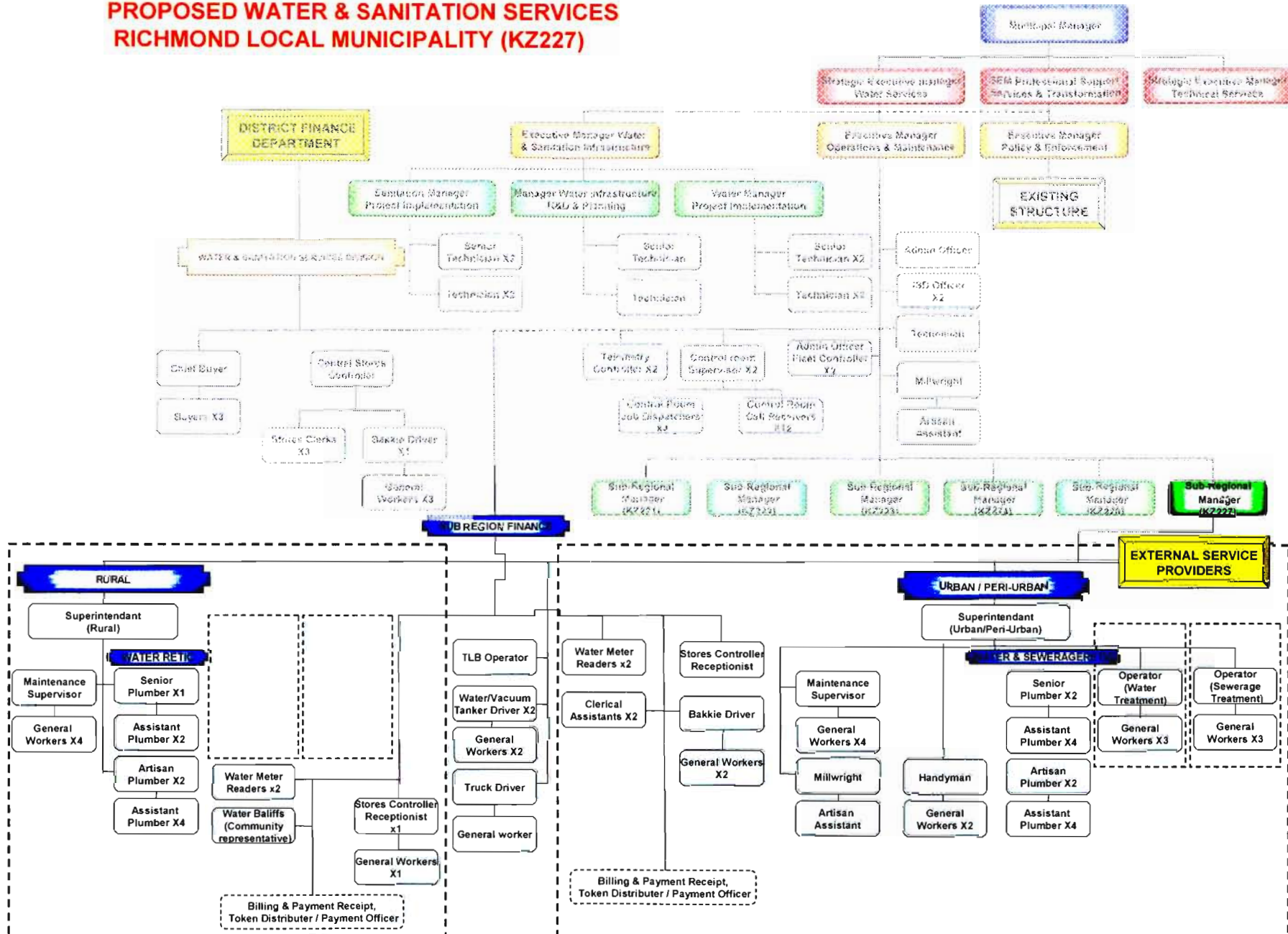


TABLE 36: REVISED STAFFING NUMBERS FOR THE RICHMOND BUSINESS UNIT AREAS.

Richmond Local Municipality – Current versus Proposed Staff complement					
Location	Designation	Current No.	Proposed Number	New Proposal	Comments
Urban	Sub-Regional Manager	1	1	1	Required
	Superintendent (Urban / Peri Urban)	1	1	1	Required (Not filled currently)
	Millwright (Artisan)		1	1	Required
	Senior Plumber (Sewerage reticulation - urban)		1	1	Required
	Senior Plumber (Water reticulation - urban)		1	1	Required
	Artisan Plumber (Water reticulation - urban)		2	2	Required
	Artisan Plumber (Sewerage Reticulation – urban)		1	0	Required (Long term- Not Required)
	Forman / Supervisor (Construction – urban)		1	1	Required
	TLB Operator		1	1	Required (Multi skill as Truck driver)
	Operator (Sewage Treatment Works – urban)		1	1	Required
	Operator (Water Treatment Works – urban)	1	1	1	Required
	Handyman (urban)		1	1	Required
	Store Bakkie driver (urban)	1	1	1	Required (Also use for inspections)
	Stores controller receptionist (urban)	1	1	1	Required
	Truck Driver		1	1	Required (Multi skill as TLB driver)
	Vacuum Tanker driver		1	1	Required
	Water Tanker driver		1	1	Required
	Artisan assistant		1	1	Required
	Stores Clerical assistant (urban)	2	2	2	Required (1 now ad another long term)
	Water meter readers (urban)	1	2	2	Required
	General worker (Water reticulation – urban)	6	6	6	Required (Change Name)
	General worker (Construction – urban)	3	4	4	Required
	General worker (Handyman – urban)		2	2	Required
	General worker (Sewerage reticulation – urban)	2	4	2	Required (Reduce to 2 & change name)
	General worker (stores – urban)		2	2	Required (1 now and another long term)
	General Worker (Truck Driver)		1	1	Required
	General worker (Vacuum Tanker driver)		1	1	Required
	General worker (Water Tanker driver)		1	1	Required
	General Workers (Sewage treatment works – urban)	2	3	3	Required
	General Workers (Water treatment works – urban)	4	4	4	Required
	Operator (Water Treatment Works – urban)	1	1	1	Required
Rural	Superintendent (Rural)		1	1	Required (immediately)
	Senior Plumber (Water reticulation - rural)	1	1	1	Required (immediately)
	Artisan Plumber (Water reticulation - rural)		2	2	Required
	Forman / Supervisor (Construction – rural)		1	1	Required
	Handyman (rural)		1	0	Required (Rather use urban component)
	Stores controller receptionist (rural)		1	1	Required
	Water meter readers (rural)	1	2	2	Required
	General worker (Water reticulation - rural)	3	6	6	Required (Change name)
	General worker (Construction – rural)	2	4	4	Required
	General worker (Handyman – rural)		2	0	Required (Rather use urban component)
	General worker (stores – rural)		1	1	Required
	Total number of staff	33	74	68	

FIGURE 26: THE FINAL PROPOSED STAFFING STRUCTURE OF THE WSPU TO BE UTILISED FOR THE RICHMOND BUSINESS UNIT

**PROPOSED WATER & SANITATION SERVICES
RICHMOND LOCAL MUNICIPALITY (KZ227)**



APPENDIX H

**THE REVISED MODEL REENGINEERING
IMPLEMENTATION ROLLOUT
PROGRAMME AS PER THE CONCLUSIONS
OF THE INTERVIEWS WITH THE
REENGINEERING TEAM**

ID	Task Name	Duration	Start	Finish	Predecess	Resource Names
1	Water and Sanitation Services Transfer Programme	257 days?	Mon 02.01.06	Tue 26.12.06		WSPU Unit
2						
3	Planning	16.5 days	Mon 02.01.06	Tue 24.01.06		WSPU Unit
4	High level pert and Gant charts	6 days	Mon 02.01.06	Mon 09.01.06		WSPU Unit
5	Communication Plan	0.5 days	Tue 10.01.06	Tue 10.01.06	4	WSPU Unit
6	Resource Allocation matrix	0.5 days	Tue 10.01.06	Tue 10.01.06	5	WSPU Unit
7	Presentation from each discipline	1.5 days	Wed 11.01.06	Thu 12.01.06	6	WSPU Unit
8	Requirements for next Phase	1 day	Thu 12.01.06	Fri 13.01.06	7	WSPU Unit
9	Project Plan Presentation to Manco	2 days	Fri 13.01.06	Tue 17.01.06	8	WSPU Unit
10	Present Project Plan to Local Municipalities	5 days	Tue 17.01.06	Tue 24.01.06	9	WSPU Unit
11	Local Municipality Analysis	24.5 days	Tue 24.01.06	Mon 27.02.06	10,3	WSPU Unit
12	Profile for each local Municipality	19 days	Tue 24.01.06	Mon 20.02.06		WSPU Unit
13	Human Resources	19 days	Tue 24.01.06	Mon 20.02.06		Human Resources Representative
14	Gather information already received	8 days	Tue 24.01.06	Fri 03.02.06		Human Resources Representative
15	Produce a profile of all the information that is required.	5 days	Fri 03.02.06	Fri 10.02.06	14	Human Resources Representative
16	Produce a profile of milestones to be achieved to meet target date.	3 days	Fri 10.02.06	Wed 15.02.06	15	Human Resources Representative
17	Identify Where Consultants will be required and for what?	3 days	Wed 15.02.06	Mon 20.02.06	16	Human Resources Representative
18	Finance	19 days	Tue 24.01.06	Mon 20.02.06		Finance Representative
19	Gather information already received	8 days	Tue 24.01.06	Fri 03.02.06		Finance Representative
20	Produce a profile of all the information that is required.	5 days	Fri 03.02.06	Fri 10.02.06	19	Finance Representative
21	Produce a profile of milestones to be achieved to meet target date.	3 days	Fri 10.02.06	Wed 15.02.06	20	Finance Representative
22	Identify Where Consultants will be required and for what?	3 days	Wed 15.02.06	Mon 20.02.06	21	Finance Representative
23	Technical	19 days	Tue 24.01.06	Mon 20.02.06		Technical Representative
24	Gather information already received	8 days	Tue 24.01.06	Fri 03.02.06		Technical Representative
25	Produce a profile of all the information that is required.	5 days	Fri 03.02.06	Fri 10.02.06	24	Technical Representative
26	Produce a profile of milestones to be achieved to meet target date.	3 days	Fri 10.02.06	Wed 15.02.06	25	Technical Representative
27	Identify Where Consultants will be required and for what?	3 days	Wed 15.02.06	Mon 20.02.06	26	Technical Representative
28	Information Technology	19 days	Tue 24.01.06	Mon 20.02.06		IT Representative
29	Gather information already received	8 days	Tue 24.01.06	Fri 03.02.06		IT Representative
30	Produce a profile of all the information that is required.	5 days	Fri 03.02.06	Fri 10.02.06	29	IT Representative
31	Produce a profile of milestones to be achieved to meet target date.	3 days	Fri 10.02.06	Wed 15.02.06	30	IT Representative
32	Identify Where Consultants will be required and for what?	3 days	Wed 15.02.06	Mon 20.02.06	31	IT Representative
33	Phase Pert,Gant and RAM	1.5 days	Mon 20.02.06	Tue 21.02.06	13,18	IT Representative,Technical Representati
34	Progress Report to Manco	4 days	Wed 22.02.06	Mon 27.02.06	33	Technical Representative
35	HR Take on	98 days	Tue 28.02.06	Thu 13.07.06	34,11	Human Resources Representative
36	Analysis of uMDM Proposed organogram	5 days	Tue 28.02.06	Mon 06.03.06		Human Resources Representative
37	Incorporation of LM, Umgeni Water and DOW staff to District	83 days	Tue 07.03.06	Thu 29.06.06	36	Human Resources Representative
38	LM Employee Database	37 days	Tue 07.03.06	Wed 26.04.06		Human Resources Representative
39	Obtaining Local Municipalities staff details.	8 days	Tue 07.03.06	Thu 16.03.06		Human Resources Representative
40	Obtaining Local Municipalities salary schedules	8 days	Fri 17.03.06	Tue 28.03.06	39	Human Resources Representative
41	Obtaining Local Municipalities staff Job Descriptions and job analysis questionairs	8 days	Wed 29.03.06	Fri 07.04.06	40	Human Resources Representative
42	Investigation into whether staff accomodation and other benefits are provided by LM's	3 days	Mon 10.04.06	Wed 12.04.06	41	Human Resources Representative
43	Aligning of Local Municipality Staff to be transferred to uMDM Organogram	10 days	Thu 13.04.06	Wed 26.04.06	42	Human Resources Representative
44	Umgeni Water and DOW Employee Database	41 days	Tue 07.03.06	Tue 02.05.06		Human Resources Representative
45	Obtaining staff details.	8 days	Tue 07.03.06	Thu 16.03.06		Human Resources Representative

ID	Task Name	Duration	Start	Finish	Prodocas	Resource Names
46	Obtaining salary schedules	8 days	Fri 17.03.06	Tue 28.03.06	45	Human Resources Representative
47	Obtaining staff Job Descriptions and job analysis questionairs	8 days	Wed 29.03.06	Fri 07.04.06	46	Human Resources Representative
48	Investigation into whether staff accomodation and other benefits are provided by LM's	7 days	Mon 10.04.06	Tue 18.04.06	47	Human Resources Representative
49	Aligning of Umgeni Water and DOW Staff to be transferred to uMDM Organogram	10 days	Wed 19.04.06	Tue 02.05.06	48	Human Resources Representative
50	Preparation of employment offers	10 days	Wed 03.05.06	Tue 16.05.06	49	Human Resources Representative
51	Meeting with staff and unions	8 days	Wed 17.05.06	Fri 26.05.06	38,50	Human Resources Representative
52	Final offer of employment contracts	8 days	Mon 29.05.06	Wed 07.06.06	51	Human Resources Representative
53	Data Capturing	8 days	Thu 08.06.06	Mon 19.06.06	52	Human Resources Representative
54	Induction of transferred staff	3 days	Tue 20.06.06	Thu 22.06.06	53	Human Resources Representative
55	Submission of salary details to finance department	2 days	Fri 23.06.06	Mon 26.06.06	54	Human Resources Representative
56	Leave capturing and opening personal files	3 days	Tue 27.06.06	Thu 29.06.06	55	Human Resources Representative
57	External service providers	5 days	Tue 07.03.06	Mon 13.03.06	36	Human Resources Representative
58	Formulization of external service provider agreements for short term contracts. (Water committees, Plumbers, Postal services and other)	5 days	Tue 07.03.06	Mon 13.03.06		Human Resources Representative
59	Performance awards policy	5 days	Fri 30.06.06	Thu 06.07.06	56,58	Human Resources Representative
60	Report to Manco	3 days	Fri 07.07.06	Tue 11.07.06	59	Human Resources Representative
61	Report to HR Committee	2 days	Wed 12.07.06	Thu 13.07.06	60	Human Resources Representative
62	Water Services Authority	200 days	Tue 28.02.06	Mon 04.12.06	34,11	WSA Representative
63	Ensure the promulgation/review of by-laws necessary for the effective provision of water services.	25 days	Tue 28.02.06	Mon 03.04.06		Finance Representative, WSA Representative
64	Revision of the WSDP	70 days	Tue 28.02.06	Mon 05.06.06		WSA Representative
65	Ensure the adoption of a Credit Control and Debt Collection by-laws and Policy that includes an indigent policy.	50 days	Tue 28.02.06	Mon 08.05.06		WSA Representative
66	Water tariffs	160 days	Tue 28.02.06	Mon 09.10.06		WSA Representative
67	Obtaining water and sanitation tariff structures from LM's	20 days	Tue 28.02.06	Mon 27.03.06		WSA Representative
68	Ensure the adoption of a Water Tariff by-laws and Policy that includes for addressing free basic water.	20 days	Tue 28.03.06	Mon 24.04.06	67	WSA Representative
69	Ensure the adoption of a Sanitation Tariff by-laws and Policy that includes for addressing free basic Sanitation.	20 days	Tue 25.04.06	Mon 22.05.06	68	WSA Representative
70	Finalization of tariff policies	10 days	Tue 23.05.06	Mon 05.06.06	69	WSA Representative
71	Promote water conservation and demand management	70 days	Tue 06.06.06	Mon 11.09.06	70	WSA Representative
72	Finalize Contracts with Bulk Water Providers.	70 days	Tue 06.06.06	Mon 11.09.06	70	WSA Representative
73	Ensure that all permits, licenses, exemptions, permissions and approvals that may be necessary in respect of the provision of water services are in place.	90 days	Tue 06.06.06	Mon 09.10.06	70	WSA Representative
74	Prepare possible service delivery agreement (WSP contract) which includes details of financial arrangements.	70 days	Tue 06.06.06	Mon 11.09.06	70	WSA Representative
75	Develop Consumer Charter in consultation with consumers that fulfils the requirements for conditions for provision of water services as set out in Section 4 of the Act, provides a system for dealing with consumers' complaints and rights to redress.	70 days	Tue 06.06.06	Mon 11.09.06	70	WSA Representative
76	Finalise negotiations concerning service delivery agreement.	70 days	Tue 06.06.06	Mon 11.09.06	70	WSA Representative
77	Establish mechanism and programme for community consultation and information dissemination regarding the service delivery agreement (section 80(2) of the Municipal Systems Act)	60 days	Tue 06.06.06	Mon 28.08.06	70	WSA Representative
78	Communicate contents of service delivery agreement to local community through the media	70 days	Tue 29.08.06	Mon 04.12.06	77	WSA Representative

ID	Task Name	Duration	Start	Finish	Precedes	Resource Names
79	Ensure that contract/s are in place to monitor and regulate service provision	70 days	Tue 29.08.06	Mon 04.12.06	77	WSA Representative
80	Estimated capital and operating costs of those water services and the financial arrangements for funding those water services, including the tariff structures	60 days	Tue 06.06.06	Mon 28.08.06	70	WSA Representative
81	If WSA is the WSP, Ensure Performance Management Contract with senior WSP managers	70 days	Tue 29.08.06	Mon 04.12.06	77	WSA Representative
82	Finance Take On	100 days?	Tue 28.02.06	Mon 17.07.06	34,11	Finance Representative
83	Consumer Database	80 days	Tue 28.02.06	Mon 19.06.06		Finance Representative
84	Extraction of a database of all consumers connections in each LM (Developed Areas)	5 days	Tue 28.02.06	Mon 06.03.06		Finance Representative
85	Linking all LM's Financial System to DM, to extract water and sanitation transactions	30 days	Tue 07.03.06	Mon 17.04.06	84	Finance Representative
86	Inclusion of all consumer connections into a GIS spacial format	20 days	Tue 18.04.06	Mon 15.05.06	85	Finance Representative
87	Linking all rural offices to DM (Undeveloped areas)	40 days	Tue 28.02.06	Mon 24.04.06		Finance Representative
88	Rural settlement consumer address allocation system	80 days	Tue 28.02.06	Mon 19.06.06		Finance Representative
89	Assigning an address (number system) to each dwelling in the rural informal settlement areas	40 days	Tue 28.02.06	Mon 24.04.06		Finance Representative
90	Inclusion of all consumer connections into a GIS spacial format (Undeveloped areas)	40 days	Tue 25.04.06	Mon 19.06.06	89	Finance Representative
91	Procurement	28 days	Tue 28.02.06	Thu 06.04.06		Finance Representative
92	Finalization of uMDM Procurement Procedures model to be adopted.	28 days	Tue 28.02.06	Thu 06.04.06		Praveen Darson
93	Service provider database (Short term Contract plumbing services or other outsourcing)	2 days	Tue 28.02.06	Wed 01.03.06		Praveen Darson
94	Material Supplier database	5 days	Thu 02.03.06	Wed 08.03.06	93	Praveen Darson
95	Procurement of service providers on contract (e.g. Water committees, Plumbers,Postal services and other)	21 days	Thu 09.03.06	Thu 06.04.06	94	Praveen Darson
96	Procurement of materials for stores	14 days	Tue 28.02.06	Fri 17.03.06		Praveen Darson
97	Procurement of specialized machinery, plant and equipment (purchase and rental)	14 days	Tue 28.02.06	Fri 17.03.06		Praveen Darson
98	Procurement of materials for emergency maintenance work. (Disaster and other emergency work)	14 days	Tue 28.02.06	Fri 17.03.06		Praveen Darson
99	Procurement of service providers for emergency maintenance work. (Disaster and other emergency work)	14 days	Tue 28.02.06	Fri 17.03.06		Praveen Darson
100	Procurement of infrastructure	20 days	Tue 28.02.06	Mon 27.03.06		Praveen Darson
101	Management of Stores	3 days	Tue 28.03.06	Thu 30.03.06	100	Praveen Darson
102	Stock Control internal administration procededures	3 days	Tue 28.03.06	Thu 30.03.06		Praveen Darson
103	Requisitions	3 days	Tue 28.03.06	Thu 30.03.06		Praveen Darson
104	Orders	3 days	Tue 28.03.06	Thu 30.03.06		Praveen Darson
105	Emergency orders	3 days	Tue 28.03.06	Thu 30.03.06		Praveen Darson
106	Delivery Notes	3 days	Tue 28.03.06	Thu 30.03.06		Praveen Darson
107	GRN	3 days	Tue 28.03.06	Thu 30.03.06		Praveen Darson
108	Payment authorization	3 days	Tue 28.03.06	Thu 30.03.06		Praveen Darson
109	Stock Control	3 days	Tue 28.03.06	Thu 30.03.06		Praveen Darson
110	Stock Taking	3 days	Tue 28.03.06	Thu 30.03.06		Praveen Darson
111	Water tariffs	1 day?	Tue 28.02.06	Tue 28.02.06		
112	Obtaining water and sanitation tariff structures from LM's	1 day?	Tue 28.02.06	Tue 28.02.06		
113	Finalization of tariff policies	1 day?	Tue 28.02.06	Tue 28.02.06		
114	Operation & Maintenance Costs	10 days	Tue 06.06.06	Mon 19.06.06	70	Finance Representative
115	Obtain O & M costs from all LM's, Umgeni Water and DOW.	10 days	Tue 06.06.06	Mon 19.06.06		Finance Representative
116	Staff accomodation	8 days	Tue 28.02.06	Thu 09.03.06		Finance Representative

ID	Task Name	Duration	Start	Finish	Predeces	Resource Names
117	Investigation into where staff accomodation is required (Link to HR)	8 days	Tue 28.02.06	Thu 09.03.06		Finance Representative
118	Formulate policy for the payment of staff accomodation and other benefits	5 days	Tue 28.02.06	Mon 06.03.06		Finance Representative
119	Billing	32 days	Tue 28.02.06	Wed 12.04.06		Finance Representative
120	Meter reading	32 days	Tue 28.02.06	Wed 12.04.06		Finance Representative
121	Policy for On time billing and meter reading of consumer water meters, Policy for Disconn	2 days	Tue 28.02.06	Wed 01.03.06		Finance Representative
122	Data Capture and verification of consumption	8 days	Thu 02.03.06	Mon 13.03.06	121	Finance Representative
123	Recording information on new water meter installations and inclusion into finance database	8 days	Tue 14.03.06	Thu 23.03.06	122	Finance Representative
124	Linking consumption and payment for consumption to the GIS system.	14 days	Fri 24.03.06	Wed 12.04.06	123	Finance Representative
125	Billing Procedures	12 days	Tue 28.02.06	Wed 15.03.06		Finance Representative
126	Billing system to be linked to procurement unit and stores	3 days	Tue 28.02.06	Thu 02.03.06		Finance Representative
127	Billing system to be linked to Fixed Assets Register and GIS	3 days	Fri 03.03.06	Tue 07.03.06	126	Finance Representative
128	Billing system must be linked to creditors system . E.g. meter and serial number linked to supplier	3 days	Wed 08.03.06	Fri 10.03.06	127	Finance Representative
129	Billing system linked to Budget	3 days	Mon 13.03.06	Wed 15.03.06	128	Finance Representative
130	Invoice Payment Procedures and policy	20 days	Tue 20.06.06	Mon 17.07.06	114	Finance Representative
131	Bill Format and Content	3 days	Tue 20.06.06	Thu 22.06.06		Finance Representative
132	Bill printing and distribution	3 days	Fri 23.06.06	Tue 27.06.06	131	Finance Representative
133	Cash handling systems	3 days	Wed 28.06.06	Fri 30.06.06	132	Finance Representative
134	Payment methods and options	3 days	Mon 03.07.06	Wed 05.07.06	133	Finance Representative
135	Establishing how the users in the rural informal settlement areas are to be billed and how payment will be made.	5 days	Thu 06.07.06	Wed 12.07.06	134	Finance Representative
136	Access to Billing / receipts database	3 days	Thu 13.07.06	Mon 17.07.06	135	Finance Representative
137	Asset Management	60 days	Tue 28.02.06	Mon 22.05.06		Finance Representative
138	Transfer of existing infrastructure	50 days	Tue 28.02.06	Mon 08.05.06		Finance Representative
139	Local Municipality Infrastructure	40 days	Tue 28.02.06	Mon 24.04.06		Finance Representative
140	Finalization of asset registers for LM's	20 days	Tue 28.02.06	Mon 27.03.06		Finance Representative
141	Valuation of infrastructure to be transferred	20 days	Tue 28.03.06	Mon 24.04.06	140	Finance Representative
142	Department of Works Infrastructure	50 days	Tue 28.02.06	Mon 08.05.06		Finance Representative
143	Appelsbosch water treatment and Sewage treatment works	20 days	Tue 28.02.06	Mon 27.03.06		Finance Representative
144	Finalization of asset registers for Other Infrastructure	20 days	Tue 28.03.06	Mon 24.04.06	143	Finance Representative
145	Valuation of infrastructure to be transferred	10 days	Tue 25.04.06	Mon 08.05.06	144	Finance Representative
146	Umgeni Water Infrastructure	40 days	Tue 28.02.06	Mon 24.04.06		Finance Representative
147	Finalization of asset registers for LM's	20 days	Tue 28.02.06	Mon 27.03.06		Finance Representative
148	Valuation of infrastructure to be transferred	20 days	Tue 28.03.06	Mon 24.04.06	147	Finance Representative
149	Auditing and reporting of Assets	10 days	Tue 09.05.06	Mon 22.05.06	148,14	Finance Representative
150	Insurance policies	2 days	Tue 23.05.06	Wed 24.05.06	137	Finance Representative
151	Infrastructure and equipment	2 days	Tue 23.05.06	Wed 24.05.06		Finance Representative
152	Vehicle insurances	2 days	Tue 23.05.06	Wed 24.05.06		Finance Representative
153	Public and staff liability	2 days	Tue 23.05.06	Wed 24.05.06		Finance Representative
154	Group life cover for employees	2 days	Tue 23.05.06	Wed 24.05.06		Finance Representative
155	Budgeting	34 days	Thu 25.05.06	Tue 11.07.06	150	Finance Representative
156	Revenue	12 days	Thu 25.05.06	Fri 09.06.06		Finance Representative
157	Forecast of revenue streams	10 days	Thu 25.05.06	Wed 07.06.06		Finance Representative
158	Reporting on revenue received	2 days	Thu 08.06.06	Fri 09.06.06	157	Finance Representative
159	Expenditure	34 days	Thu 25.05.06	Tue 11.07.06		Finance Representative
160	Infrastructure	34 days	Thu 25.05.06	Tue 11.07.06		Finance Representative
161	Capex and control reporting	14 days	Thu 25.05.06	Tue 13.06.06		Finance Representative

ID	Task Name	Duration	Start	Finish	Predeces	Resource Names
162	Property acquisitions	2 days	Thu 25.05.06	Fri 26.05.06		Finance Representative
163	Property leases	2 days	Mon 29.05.06	Tue 30.05.06	162	Finance Representative
164	Water treatment plants	2 days	Wed 31.05.06	Thu 01.06.06	163	Finance Representative
165	Water reticulation (Bulk & distribution reticulation)	2 days	Fri 02.06.06	Mon 05.06.06	164	Finance Representative
166	Basic Water supply (Spring Protections, Borehole hand pumps)	2 days	Tue 06.06.06	Wed 07.06.06	165	Finance Representative
167	Sewerage Reticulation (Bulk & Distribution)	1 day	Thu 08.06.06	Thu 08.06.06	166	Finance Representative
168	Sewage treatment works	1 day	Fri 09.06.06	Fri 09.06.06	167	Finance Representative
169	Basic sanitation (VIP toilets)	1 day	Mon 12.06.06	Mon 12.06.06	168	Finance Representative
170	Reporting procededures for financial expenditure	1 day	Tue 13.06.06	Tue 13.06.06	169	Finance Representative
171	Opex and control reporting	34 days	Thu 25.05.06	Tue 11.07.06		Finance Representative
172	Refurbishment and maintenance of buildings	2 days	Thu 25.05.06	Fri 26.05.06		Finance Representative
173	Water treatment plants	2 days	Mon 29.05.06	Tue 30.05.06	172	Finance Representative
174	Water reticulation (Bulk & distribution reticulation)	2 days	Wed 31.05.06	Thu 01.06.06	173	Finance Representative
175	Basic Water supply (Spring Protections, Borehole hand pumps)	2 days	Fri 02.06.06	Mon 05.06.06	174	Finance Representative
176	Water tankering service	2 days	Tue 06.06.06	Wed 07.06.06	175	Finance Representative
177	Sewerage Reticulation (Bulk & Distribution)	2 days	Thu 08.06.06	Fri 09.06.06	176	Finance Representative
178	Sewage treatment works	2 days	Mon 12.06.06	Tue 13.06.06	177	Finance Representative
179	Basic sanitation (VIP toilets)	2 days	Wed 14.06.06	Thu 15.06.06	178	Finance Representative
180	Vacume tanker service	2 days	Fri 16.06.06	Mon 19.06.06	179	Finance Representative
181	Transportation	1 day	Tue 20.06.06	Tue 20.06.06	180	Finance Representative
182	Health, Safety and Security Costs	1 day	Wed 21.06.06	Wed 21.06.06	181	Finance Representative
183	Insurance on infrastructure and equipment	1 day	Thu 22.06.06	Thu 22.06.06	182	Finance Representative
184	Reporting procededures for Opex expenditure	1 day	Tue 11.07.06	Tue 11.07.06	183,34	Finance Representative
185	Remuneration and Benefits	8 days	Thu 25.05.06	Mon 05.06.06		Finance Representative
186	Permanent employees	4 days	Thu 25.05.06	Tue 30.05.06		Finance Representative
187	Contract employees	4 days	Wed 31.05.06	Mon 05.06.06	186	Finance Representative
188	Awareness campaigns	2 days	Thu 25.05.06	Fri 26.05.06		Finance Representative
189	Promote a culture of payment	2 days	Thu 25.05.06	Fri 26.05.06		Finance Representative
190	Report to Manco	2 days	Wed 12.07.06	Thu 13.07.06	187,18	Finance Representative
191	Report to Finance Committee	2 days	Fri 14.07.06	Mon 17.07.06	190	Finance Representative
192	Technical Take On	183 days	Tue 28.02.06	Thu 09.11.06	11	Technical Representative
193	Start	183 days	Tue 28.02.06	Thu 09.11.06		Technical Representative
194	Projects Asset Database	28 days	Tue 28.02.06	Thu 06.04.06		Technical Representative
195	Obtain Hard / electronic coples of drawings, GIS if available, of all water and sanitation schemes.	22 days	Tue 28.02.06	Wed 29.03.06		Technical Representative
196	Obtain a full asset register from LM's, Umgeni Water and DOW's of all water and Sanitation Schemes, Plant and equipment.	23 days	Tue 28.02.06	Thu 30.03.06		Technical Representative
197	Finalization of Asset Registers	5 days	Fri 31.03.06	Thu 06.04.06	196,19	Technical Representative
198	Water Supply	23 days	Fri 07.04.06	Tue 09.05.06	197	Technical Representative
199	Audit of Existing Water schemes	22 days	Fri 07.04.06	Mon 08.05.06		Technical Representative
200	Ascertain the consistency of supply	22 days	Fri 07.04.06	Mon 08.05.06		Technical Representative
201	Ascertain the financial viability and technical sustainability of the Schemes.	10 days	Fri 07.04.06	Thu 20.04.06		Technical Representative
202	Ascertain the Quality of water provided.	10 days	Fri 07.04.06	Thu 20.04.06		Technical Representative
203	Water Purification treatment process utilized.	10 days	Fri 07.04.06	Thu 20.04.06		Technical Representative

ID	Task Name	Duration	Start	Finish	Precedes	Resource Names
204	Frequency of water quality analysis (Potable Water)	10 days	Fri 07.04.06	Thu 20.04.06		Technical Representative
205	Statutory compliance to Water Quality Specifications	10 days	Fri 07.04.06	Thu 20.04.06		Technical Representative
206	Who is appointed to do the water quality testing (Tender for Service Provision)	10 days	Fri 07.04.06	Thu 20.04.06		Technical Representative
207	Sustainability of water sources	5 days	Fri 07.04.06	Thu 13.04.06		Technical Representative
208	Monitoring of borehole supplies (Tender for a service Contract)	5 days	Fri 07.04.06	Thu 13.04.06		Technical Representative
209	Monitoring of other water sources (Tender for a service contract)	5 days	Fri 07.04.06	Thu 13.04.06		Technical Representative
210	Finalization of Water Supply	1 day	Tue 09.05.06	Tue 09.05.06	209,21	Technical Representative
211	Sanitation Provision	35 days	Fri 07.04.06	Thu 25.05.06	197	Technical Representative
212	Audit of Existing Sanitation infrastructure	20 days	Fri 07.04.06	Thu 04.05.06		Technical Representative
213	Sewage treatment plant process utilized.	20 days	Fri 07.04.06	Thu 04.05.06		Technical Representative
214	Ascertain the Quality of effluent discharged.	13 days	Fri 05.05.06	Tue 23.05.06	213	Technical Representative
215	Frequency of water quality analysis (Effluent discharges)	10 days	Fri 05.05.06	Thu 18.05.06		Technical Representative
216	Statutory compliance to Water Quality Specifications	10 days	Fri 05.05.06	Thu 18.05.06		Technical Representative
217	Who is appointed to do the water quality testing (Tender for Service Provision)	10 days	Wed 10.05.06	Tue 23.05.06	210	Technical Representative
218	Finalization of Sanitation Provision	2 days	Wed 24.05.06	Thu 25.05.06	215,21	Technical Representative
219	Infrastructure	80 days	Fri 26.05.06	Thu 14.09.06	218	Technical Representative
220	Official offices for the operation division	40 days	Fri 26.05.06	Thu 20.07.06		Technical Representative
221	Stores in each Local Municipality	8 days	Fri 26.05.06	Tue 06.06.06		Technical Representative
222	Central operation department offices and Stores in PMB	60 days	Fri 26.05.06	Thu 17.08.06		Technical Representative
223	Finalization of Infrastructure	20 days	Fri 18.08.06	Thu 14.09.06	222,21	Technical Representative
224	Operations	137 days	Fri 07.04.06	Mon 16.10.06	197	Technical Representative
225	Service agents for the following services:	40 days	Fri 07.04.06	Thu 01.06.06	197	Consultant
226	Electricity instalations (Tender for Service Provision)	40 days	Fri 07.04.06	Thu 01.06.06		Consultant
227	Telemetry systems (Tender for Service Provision)	40 days	Fri 07.04.06	Thu 01.06.06		Consultant
228	Repair of PRV's and pumping equipment (Tender for Service Provision)	40 days	Fri 07.04.06	Thu 01.06.06		Consultant
229	Water quality testing (Tender for Service Provision)	40 days	Fri 07.04.06	Thu 01.06.06		Consultant
230	Telecommunications (Tender for Service Provision)	40 days	Fri 07.04.06	Thu 01.06.06		Consultant
231	Water source Monitoring (Possible)	40 days	Fri 07.04.06	Thu 01.06.06		Consultant
232	Specialized machinery and Equipment	40 days	Fri 07.04.06	Thu 01.06.06		Consultant
233	Armed Security Service (Tender for Service Provision)	40 days	Fri 07.04.06	Thu 01.06.06		Consultant
234	Vehicle Maintenance Service (Tender for Service Provision)	40 days	Fri 07.04.06	Thu 01.06.06		Consultant

ID	Task Name	Duration	Start	Finish	Precedes	Resource Names
235	Other Specialized maintenance works (Welders and Engineering services)	40 days	Fri 07.04.06	Thu 01.06.06		Consultant
236	Finalization of Service Agreements	2 days	Fri 02.06.06	Mon 05.06.06	235,2	Technical Representative
237	Preventative Maintenance	16 days	Wed 07.06.06	Wed 28.06.06	221	Technical Representative
238	Investigate what Maintenance Planning and scheduling exists in LM's	8 days	Wed 07.06.06	Fri 16.06.06		Technical Representative
239	Servicing of Pumps, Pessure reducing valves etc.	8 days	Wed 07.06.06	Fri 16.06.06		Technical Representative
240	Verification and Replacement of damaged isolating valves, fire hydrants etc.	8 days	Wed 07.06.06	Fri 16.06.06		Technical Representative
241	General maintenance, e.g. painting of pipe markerposts, ensuring access to valve covers, replacement of damaged locks.	8 days	Wed 07.06.06	Fri 16.06.06		Technical Representative
242	Sheduled inspections of reservoirs (Structural integrity, water tightness, cleaning)	8 days	Wed 07.06.06	Fri 16.06.06		Technical Representative
243	Pressure and flow logging to determine pressure management failures	8 days	Mon 19.06.06	Wed 28.06.06	242	Technical Representative
244	Operation & Maintenance Manuals (Tender for Service Provision)	40 days	Fri 26.05.06	Thu 20.07.06	218	Technical Representative
245	Preparation of Operation & Maintenance manuals for Water treatment plants	40 days	Fri 26.05.06	Thu 20.07.06		Consultant
246	Preparation of Operation & Maintenance manuals for Sewage treatment plants	40 days	Fri 26.05.06	Thu 20.07.06		Consultant
247	Preparation of O&M manuals for water supply schemes	40 days	Fri 26.05.06	Thu 20.07.06		Consultant
248	Preparation of O&M manuals for sanitation supply schemes	40 days	Fri 26.05.06	Thu 20.07.06		Consultant
249	Replacements	8 days	Thu 29.06.06	Mon 10.07.06	243	Technical Representative
250	Replacement of old infrastructure viz. pipelines, water meters, pumps, locks etc.	8 days	Thu 29.06.06	Mon 10.07.06		Technical Representative
251	Reduction of Lost revenue.	8 days	Tue 11.07.06	Thu 20.07.06	250	Technical Representative
252	Reticulation System and Zoning	8 days	Tue 11.07.06	Thu 20.07.06		Technical Representative
253	Meters Testing and Replacement	8 days	Tue 11.07.06	Thu 20.07.06		Technical Representative
254	Maintaining Supply and Appropriate Pressures	8 days	Tue 11.07.06	Thu 20.07.06		Technical Representative
255	Water Conservation	8 days	Tue 11.07.06	Thu 20.07.06		Technical Representative
256	Water consumption recording and balancing.	8 days	Tue 11.07.06	Thu 20.07.06		Technical Representative
257	Possitive Displacement testing on Reservoirs	8 days	Tue 11.07.06	Thu 20.07.06		Technical Representative
258	Continues maintenance improvements	40 days	Thu 29.06.06	Wed 23.08.06	243	Technical Representative
259	Updating of reticulation drawings on GIS when changes or additions are made to the reticulation infrastructure.	20 days	Thu 29.06.06	Wed 26.07.06		GIS Representative
260	Maintenance performance measurement (Quantitative and qualitative delivery)	40 days	Thu 29.06.06	Wed 23.08.06		GIS Representative

ID	Task Name	Duration	Start	Finish	Predecessor	Resource Names
261	Consolidate and propose a standard Maintenance Planning & Scheduling framework (O&M Manuals to be added at a later stage)	3 days	Fri 21.07.06	Tue 25.07.06	252,21	Technical Representative
262	Health and Safety	20 days	Fri 15.09.06	Thu 12.10.06	219	Technical Representative
263	Ensure safety plans are in place for all treatment works (Water and Sanitation)	20 days	Fri 15.09.06	Thu 12.10.06		Technical Representative
264	Ensure that a Health and Safety policy is developed	20 days	Fri 15.09.06	Thu 12.10.06		Technical Representative
265	Ensure all staff have health and safety equipment	8 days	Fri 15.09.06	Tue 26.09.06		Technical Representative
266	Ensure all infrastructure meets safety requirements	8 days	Fri 15.09.06	Tue 26.09.06		Technical Representative
267	Ensure all vehicles meet health and safety requirements	8 days	Fri 15.09.06	Tue 26.09.06		Technical Representative
268	Ensure safety equipment e.g. shoring is available in the working environment	8 days	Fri 15.09.06	Tue 26.09.06		Technical Representative
269	Finalization of Health and Safety	2 days	Fri 13.10.06	Mon 16.10.06	268,21	Technical Representative
270	Operation systems	5 days	Tue 06.06.06	Mon 12.06.06	236	Technical Representative
271	Use of SCADA on treatment plants to monitor and report of their operation	5 days	Tue 06.06.06	Mon 12.06.06		Technical Representative
272	Telemetry system for reporting on water levels in reservoirs, status of pumps, PRV's and specific valves.	5 days	Tue 06.06.06	Mon 12.06.06		Technical Representative
273	Telemetry / GPRS systems for monitoring of water sources e.g. borehole water levels.	5 days	Tue 06.06.06	Mon 12.06.06		Technical Representative
274	Telemetry system for security purposes.	5 days	Tue 06.06.06	Mon 12.06.06		Technical Representative
275	Payroll / Clock card system, logsheets or other	5 days	Tue 06.06.06	Mon 12.06.06		Technical Representative
276	Job cards with audit trail	5 days	Tue 06.06.06	Mon 12.06.06		Technical Representative
277	Call Centre	4.67 days	Tue 06.06.06	Mon 12.06.06		IT Representative, Finance Representative
296	Communication	2.33 days	Fri 15.09.06	Tue 19.09.06	219	IT Representative, Finance Representative
297	Car phones	2.33 days	Fri 15.09.06	Tue 19.09.06		IT Representative, Finance Representative
298	Pagers	2.33 days	Fri 15.09.06	Tue 19.09.06		IT Representative, Finance Representative
299	Cell phones	2.33 days	Fri 15.09.06	Tue 19.09.06		IT Representative, Finance Representative
300	Finalization of the Operational System	0.67 days	Tue 19.09.06	Tue 19.09.06	299,21	IT Representative, Finance Representative
301	Transportation / Vehicles	62 days	Fri 07.04.06	Mon 03.07.06	197	Technical Representative, Finance Representative
302	Hiring of vehicles	20 days	Fri 07.04.06	Thu 04.05.06		Technical Representative
303	Excavator (20 ton Approx 100Kw)	20 days	Fri 07.04.06	Thu 04.05.06		Technical Representative
304	Low-bed Truck (25 tons)	20 days	Fri 07.04.06	Thu 04.05.06		Technical Representative
305	Purchase of vehicles	40 days	Fri 07.04.06	Thu 01.06.06		Technical Representative
306	Tipper Trucks (6m ³) for Backfill	40 days	Fri 07.04.06	Thu 01.06.06		Technical Representative
307	Trucks (5 ton) Modified for Maintenance	40 days	Fri 07.04.06	Thu 01.06.06		Technical Representative
308	Delivery Bakkies (1 ton)	40 days	Fri 07.04.06	Thu 01.06.06		Technical Representative
309	Water Tankers (20Kl)	40 days	Fri 07.04.06	Thu 01.06.06		Technical Representative
310	Vacume Tankers (20Kl)	40 days	Fri 07.04.06	Thu 01.06.06		Technical Representative
311	TLB's	40 days	Fri 07.04.06	Thu 01.06.06		Technical Representative
312	Vehicle allocation and utilization control policy	40 days	Fri 07.04.06	Thu 01.06.06		Technical Representative
313	Fitting of tracking devices	20 days	Fri 02.06.06	Thu 29.06.06	312	Technical Representative

ID	Task Name	Duration	Start	Finish	Precedes	Resource Names
314	Finalization on Transportation and vehicles	2 days	Fri 30.06.06	Mon 03.07.06	313,31	Technical Representative
315	Machinery and equipment	32 days	Fri 15.09.06	Mon 30.10.06	219	Technical Representative
316	Hiring of machinery and equipment	10 days	Fri 15.09.06	Thu 28.09.06		Technical Representative
317	Machinery and equipment to be specified	10 days	Fri 15.09.06	Thu 28.09.06		Technical Representative
318	Purchase of machinery and equipment	30 days	Fri 15.09.06	Thu 26.10.06		Technical Representative
319	Wackers	30 days	Fri 15.09.06	Thu 26.10.06		Technical Representative
320	Jack hammers	30 days	Fri 15.09.06	Thu 26.10.06		Technical Representative
321	Pumps, generators and lights	30 days	Fri 15.09.06	Thu 26.10.06		Technical Representative
322	Jetting Machines	30 days	Fri 15.09.06	Thu 26.10.06		Technical Representative
323	Rodding Rods	30 days	Fri 15.09.06	Thu 26.10.06		Technical Representative
324	Hoses & Jumpers with PRV's	30 days	Fri 15.09.06	Thu 26.10.06		Technical Representative
325	Pressure Logging equipment and software	30 days	Fri 15.09.06	Thu 26.10.06		Technical Representative
326	Small Tools	30 days	Fri 15.09.06	Thu 26.10.06		Technical Representative
327	Shoring	30 days	Fri 15.09.06	Thu 26.10.06		Technical Representative
328	Finalization on Machinery and Equipment	2 days	Fri 27.10.06	Mon 30.10.06	327,31	Technical Representative
329	Security	20 days	Fri 26.05.06	Thu 22.06.06	218	Technical Representative
330	Standardization of locks with master key per Local Municipality	20 days	Fri 26.05.06	Thu 22.06.06		Technical Representative
331	Standard lock for electrical works	20 days	Fri 26.05.06	Thu 22.06.06		Technical Representative
332	Standard lock for reticulation infrastructure	20 days	Fri 26.05.06	Thu 22.06.06		Technical Representative
333	Report to Manco	4 days	Tue 31.10.06	Fri 03.11.06	332,31	Technical Representative
334	Report to Infrastructure Committee	4 days	Mon 06.11.06	Thu 09.11.06	333	Technical Representative
335	Information Technology	135 days	Tue 28.02.06	Mon 04.09.06	34	IT Representative
336	Call Centre	20 days	Tue 28.02.06	Mon 27.03.06		IT Representative
337	Wan Link to LM and Site Offices	20 days	Tue 28.03.06	Mon 24.04.06	336	IT Representative
338	Fault reporting and tracking System	20 days	Tue 25.04.06	Mon 22.05.06	337	IT Representative
339	Work flow audit system	35 days	Tue 23.05.06	Mon 10.07.06	338	IT Representative
340	Payroll / Clock card system or other	20 days	Tue 23.05.06	Mon 19.06.06		IT Representative
341	Job cards with audit trail	15 days	Tue 20.06.06	Mon 10.07.06	340	IT Representative
342	MOA with LM for IT Support	20 days	Tue 11.07.06	Mon 07.08.06	339	IT Representative
343	Finance system exports	10 days	Tue 08.08.06	Mon 21.08.06	342	IT Representative
344	Report to Manco	5 days	Tue 22.08.06	Mon 28.08.06	343	IT Representative
345	Report to relevant Steering Committee	5 days	Tue 29.08.06	Mon 04.09.06	344	IT Representative
346	Integration of sectors	20 days	Fri 10.11.06	Thu 07.12.06	35,82,	WSPU Unit
347	Systems Integration	20 days	Fri 10.11.06	Thu 07.12.06	345,31	WSPU Unit
348	Integrated Finance Water billing System	20 days	Fri 10.11.06	Thu 07.12.06		WSPU Unit
349	Centralise and intergrate call centre and fault management centre (Technical, finance, HR and IT)	20 days	Fri 10.11.06	Thu 07.12.06		WSPU Unit
350	Systems integration into Dims	20 days	Fri 10.11.06	Thu 07.12.06		WSPU Unit
351	Shared IT Support	20 days	Fri 10.11.06	Thu 07.12.06		WSPU Unit
352	Report to Manco	20 days	Fri 10.11.06	Thu 07.12.06		Technical Representative
353	Report to Exco	2 days	Fri 10.11.06	Mon 13.11.06		Technical Representative
354	Letter to all Consumers	2 days	Tue 14.11.06	Wed 15.11.06	353	WSA Representative
355	Operations Infrastructure	18 days	Fri 15.09.06	Tue 10.10.06	223	WSPU Unit
356	Finalization of Site Offices	8 days	Fri 15.09.06	Tue 26.09.06		WSPU Unit
357	Site Offices linked to WAN	8 days	Wed 27.09.06	Fri 06.10.06	356	WSPU Unit
358	Report to Manco	2 days	Mon 09.10.06	Tue 10.10.06	357	WSPU Unit
359	Project Handover	6 days	Fri 08.12.06	Fri 15.12.06	354,31	WSPU Unit

ID	Task Name	Duration	Start	Finish	Priority	Resource Names
360	Presentation to all stakeholders	1 day	Fri 08.12.06	Fri 08.12.06		WSA Representative, Technical Represen
361	Policies and Procedures	2 days	Mon 11.12.06	Tue 12.12.06	360	WSA Representative
362	Press conference	1 day	Wed 13.12.06	Wed 13.12.06	361	WSA Representative, Technical Represen
363	Project Sustainability report	1 day	Thu 14.12.06	Thu 14.12.06	362	WSA Representative, Technical Represen
364	Reports to all relevant Committees	1 day	Fri 15.12.06	Fri 15.12.06	363	WSA Representative, Technical Represen
365	Completion of Project	7 days	Mon 18.12.06	Tue 26.12.06	364,365	WSPU Unit

APPENDIX I

REVIEW OF THE

UMGUNGUNDLOVU PEER

REVIEW REPORT

EXTRACT OF THE PEER REVIEW REPORT PERFORMED ON THE
UMGUNGUNDLOVU DISTRICT MUNICIPALITY HELD ON
16TH AND 17TH FEBRUARY 2006

1 INSTITUTIONAL PERSPECTIVE

General observations

- 1 The WSA located in the Municipal managers' office currently gives it an advantage of access to decision-making but there may be a challenge to delegate more authority to WSA function once the WSP function is fully established internally, if WSA is to provide meaningful leadership over the WSP function – ring-fencing (Palmer, p.5).
- 2 The programme developed for the establishment of the WSPU may have underestimated the time it might take to bed down the implementation of the decision about the WSP arrangement (Palmer, p.5).
 - i Experience shows that other municipalities have taken more than a year to implement a preferred option once a decision has been taken (Palmer, p.5).
 - ii The time available does not allow doing feasibility studies (Palmer, p.5).
- 3 The decision to adopt the internal mechanism seems to have centralised the risk of delivering services. No clear justification for this if the provision is still going to be decentralised using local municipality (LM) areas as service areas (Palmer, p.5).
- 4 The level of seniority of staff reporting to the WSA Manager may limit ability to delegate effectively (Palmer, p.6).
- 5 The WSA structure seems to have been fitted into an existing structure without a proper review of the overall municipal organisational arrangements that best accommodate the water services function (Palmer, p.6).

Strengths

- 1 The uMDM seems conscious of things that should be done to restructure water services – but the time planned to do them might have been underestimated (Palmer, p.7).
- 2 The establishment of a sub-committee to improve participation of politicians in the section 78 has been innovative and seems to have paid dividends with the municipality moving forward (Palmer, p.7).

Challenges

- 1 The uMDM has to finalise its structure, staff transfer, policies and water bylaws, as this is hampering service delivery (Palmer, p.7).

Recommendations

- 1 A proper reporting mechanism between the uMDM and the WSPs as well as between the WSA, WSP's, Implementing agents and the district's project management unit (PMU) are necessary (Palmer, p.7).
- 2 The uMDM does not need to have 6 WSP offices because there are 6 LM's. It can look for economies of scale and follow that because you have to cut down on operational costs. It can therefore define new service areas independently of LM boundaries (Palmer, p.7).
- 3 The uMDM may have to extend contracts with the current WSP's to allow time for all feasibility studies that have to be conducted (Palmer, p.8).

2 FINANCIAL PERSPECTIVE

General observations

- 1 Some key policies are not in place (largely because of the various WSP policies currently being applied). These include the credit control; tariff; procurement; free basic water and indigent policies. The municipality cannot move too far without policies (Palmer, p.11).
- 2 There is a good handle on the amounts and age of debt but the uMDM also need to understand if the debt age is a result of non-payment or system failure (Palmer, p.11).

Strengths

- 1 The uMDM has personnel dedicated to water services in the Finance Department (Palmer, p.11).
- 2 The uMDM has information on who owes and actual amounts (Palmer, p.11).
- 3 The uMDM has internal audit mechanisms that ensure proper accounting within WSPs (LM's), however there is a need to further strengthen this (Palmer, p.11).
- 4 The uMDM acknowledge their capacity limitations and are acting on this to remedy them (Palmer, p.11).

Recommendations

- 1 There is a need to prioritise the development and implementation of policies (This is to be factored into the Section 78 implementation plan) (Palmer, p.11).
- 2 There is a need to understand who the debtors are as most of the debt seems unrecoverable. The uMDM must analyse the debtors' book that will be inherited from the LM's (Palmer, p.11).
- 3 It may be advisable to write-off unrecoverable debt in order to start with a cleaner balance sheet (Palmer, p.11).
- 4 The use of financial ratios to try and understand performance of different service areas (LM areas) (Palmer, p.11).
- 5 There is a need to reconsider the tariff objective especially with regard to different levels of services. The WRC and DWAF can assist with this exercise (Palmer, p.11).
- 6 The uMDM is to adequately quantify the O&M costs of the planned infrastructure investment (Palmer, p.11).

3 STRATEGIC ASSET MANAGEMENT

Recommendations

- 1 There is a need to prioritise the core assets of water services in trying to understand issues such as value, condition, refurbishment need, and maintenance requirements (Palmer, p.12).
- 2 The uMDM should apply the risk and vulnerability concept in asset management (Palmer, p.12).
- 3 The team strongly recommend standardisation of systems and technology. Trying to interface different systems and technologies generally has not worked in many places. This will assist in areas of, for example, inventory management. Invest more in understanding and developing the area strategic asset management (Palmer, p.12).
- 4 Arrange learning opportunities with CT, Umgeni and Swaziland (Palmer, p.12).
- 5 The uMDM should link the asset management plan to investment plan so that there may be a clear justification of investment decisions (Palmer, p.12).
- 6 The uMDM should need to carefully consider which facilities (and facility capacity) is needed in-house e.g. water quality lab (Palmer, p.12).
- 7 The uMDM should need to have a more active process of strategic asset management (Palmer, p.12).

- 8 Strategic asset management function should reside with Users of Assets and Finance should be the support. Definition of Strategic asset management is important (Palmer, p.12).

4 SERVICE STANDARDS

Strengths

- 1 The transparency of the uMDM on challenges and willingness to change is encouraging to all other DMs in the team (Palmer, p.15).
- 2 Effort to make proper arrangements for sanitation, and health and hygiene promotion are notable (Palmer, p.15).
- 3 The water services team projects vibrancy and energy to deliver services despite limited resources is acknowledged (Palmer, p.15).
- 4 The team also project an existence of a healthy environment for debate (Palmer, p.15).
- 5 There is a willingness on the part of uMDM to work with LMs (Palmer, p.15).

Challenges

- 1 The uMDM has difficulty in accessing reliable information from WSPs and this makes planning and controlling a challenge (Palmer, p.15).
- 2 The water quality monitoring may not be acceptable (Palmer, p.15).
- 3 During this interim period, WSP's appear not to be fully accountable to the DM for standards of service (Palmer, p.15).
- 4 There seems to be a lack of understanding of competency and capacity needs (Palmer, p.15).

Recommendations

- 1 The uMDM needs to put more effort into water quality management including increasing the frequency of sampling (Palmer, p.15).
- 2 The uMDM needs to develop a tariff policy that links to a service level policy (Palmer, p.15).
- 3 The uMDM needs to think creatively about application of policy
 - i The uMDM interpretation of DWAF policy on water meters is too narrow (Palmer, p.16).
 - ii The uMDM needs to increase its awareness of sector developments and participate in sector structures (Palmer, p.16).

- 4 The uMDM needs to further investigate the appropriateness of regional water supply arrangements in the medium to long term (Palmer, p.16).