New University in Mpumalanga Province
Bulk Services Feasibility Report

STATUS OF REPORT: Draft

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1. INTRODUCTION

The Bulk Services includes all Municipal services that are provided by the Mbombela Local Authority in support to the establishment of the New University in the Mpumalanga Province including water, sanitation, electricity, roads and storm water, transport and traffic and waste management.

1.1 PURPOSE OF THE REPORT

The purpose of the report is to provide some detail on the status of bulk Municipal Infrastructure services to the proposed new university site. The information in the report is a collation of information received from reports, discussions with municipal officials and staff from the Lowveld Agricultural College (LAC) and from observations during site visits.

1.2 STATUS OF BULK SERVICES

The new university in Mpumalanga Province will unlike the university in Sol Plaatje will be essentially a greenfields development located on a large track of land. The university will be dependent on the bulk infrastructure to be supplied from the Mbombela, but will not share internal infrastructure with other users.

The PMT met with the management team from the LAC during a very positive meeting. From the discussion it became evident that the College farm is an essential and critical teaching resource for the College academic programmes because it provides an important link between theory and practice. Students do practical work on the farm where various tropical and sub-tropical crops are planted. It is therefore important to have quality bulk service infrastructure available on the premises.

The basic bulk services on the LAC premises are summarized in Table 1.

Table 1: Basic Infrastructure Information

ITEM	NO	CAPACITY
SEWERAGE PUMPS	2x11KW EACH PUMP	22 KW
ESKOM	FEEDER TO HOSTELS, ADMIN, SPORTS	400 AMP (THREE PHASE)
ESKOM	FEEDER TO FARM SECTION	250KVA (THREE PHASE)
IRRIGATION DAM	NEXT TO ADMIN 1000M^3	1 000 m^3 RAW WATER
SMALL IRRIGATION DAM	NEXT TO GOLF LAPA	DAM 100M^3 RAW WATER
CEMENT DAM	DAM NEXT TO R40	10 000M^3 RAW WATER
MAIN IRRIGATION DAM	DAM AT THE FARM	DAM 20 000 M^3
RESERVOIR	DAM	1Ml (1000M^3) POTABLE WATER

Short description of each component follows below.

1.3 POTABLE WATER

1.3.1 Current status potable water

According to the 2009 Water Services Development Plan (WSDP), a large number of households towards Hazyview receive water below the basic water requirements. This will add to the pressure for the Mbombela to supply water to all consumers in future. According to the Master Plan, the water loss in Nelspruit is about 22%. A Bulk Water Strategy is being developed to accomdate future water demands and projected expansions to the required water infrastructure.

There is a 1 Ml reservoir on a hill north of the Agricultural College main buildings which provide potable water at sufficient pressure to the entire site for domestic purposes. According to the LAC no water shortages have been experienced to date.

1.3.2 Irrigation water

The College farm is part of the College grounds comprising of about 100 hectares arable land under irrigation, two main dams, two centre pivot irrigation centres for agronomy, micro irrigation for subtropical crops and draglines for vegetables. Hetero-culture exist (variety of crops) for maximising practical training and various farm related buildings with fully equipped stores to service all activities are available. Fully equipped engineering workshops and building maintenance teams are on site to do all necessary maintenance in-house. One nursery fully equipped for various forms of plant propagation is functioning to fulfil the training needs of students.

The college obtains its raw water for irrigation purposes from a canal system on the north and eastern side of the premises (the LAC forms part of an irrigation board which divert water out of the perennial Nel River). There are a few dams on the premises where raw water is stored. Water is boosted into the irrigation systems by means of booster pumps. There is sufficient water for irrigation purposes.

1.3.3 Future planning potable water

It is predicted that the university will grow to a 15 000 student campus. The expansion of services should therefore accommodate the growth over a medium to long term. Detail assessments will be made to phase student growth vs existing capacity during the due diligence investigations that will be undertaken during October 2012. The following is foreseen:

- Bulk water supply – The 1Ml reservoir will be sufficient on the short term but will have to be extended on the medium term to accommodate growth. The supply pipeline to this reservoir will also have to assessed.
- Distribution and reticulation – the water supply network into the campus and on site will have to be upgraded and re-planned. This will be done once a campus layout has been confirmed. This implementation of water networks, control systems, metering, etc on the site will have to be undertaken as priority during the current year.

The estimated budget to upgrade the water supply in Nelspruit is estimated at about R410m (2009 figure). This should also accommodate the needs for the New University.

1.3.4 Risks potable water

The development of the new university will add to the pressure on water supply over the medium to long term. Assurance was given by the Municipality that the additional demand for water to the campus will be accommodated within the medium planning and implementation process.

1.4 SANITATION SERVICES

1.4.1 Current Status sanitation

The waste water from the premises is discharged into the network serviced by the Mbombela Local Municipality (MLM). The onsite facilities comprise:

- Waste water from the college and residences complex drains in a south western direction towards a sump from where the raw sewerage is pumped towards an outfall sewer line managed by the MLM. Basic screening is done at the sump which is the responsibility of the College maintenance teams.
- Waste water from the workshops and some houses drains (gravitates) in a north western direction towards a MLM outfall sewer

No problems are experienced with regard to sanitation facilities on site.

The WSDP reflects high sanitation backlogs in the MLM of below basic sanitation services with Nelspruit almost 40%. This requires urgent interventions to improve the health standards of communities which will add to the financial commitment by the MLM. An amount of more than R 609 million is required to provide basic sanitation services.

1.4.2 Future planning sanitation

According to MLM, the Waste Water Treatment Works facilities will be able to handle the short term effluent discharges from the Campus.

The sanitation network on and from the campus will have to be upgraded and re-planned. This will be done once a campus layout has been confirmed. A double discharge sewer network will be considered to split grey and black waste water on the site. Grey water will be used to feed into the existing irrigation system while the remaining effluent will be treated on site or discharge into the MLM sanitation network and as such reduce the pressure for the MLM not having to deal with increasing effluent discharge from the campus.

1.4.3 Risks sanitation

No risks are foreseen.

The use of grey water for on-site irrigation should consider the existence of high groundwater table on the low lying areas of the campus and of the wetland along the Nel River.

1.5 ELECTRICITY

Eskom is the main supplier of bulk electricity to the LAC and to the Municipality.

1.5.1 Current status electricity

Electricity is purchased directly from Eskom by LAC with no disruptions/failures in supply. There is a power supply substation (132KVA) located next to the premises- see **Annexure A** for the position.

The current distribution network comprises a ring network on the premises which could provide in the demand.

1.5.2 Future planning electricity

It is foreseen that sufficient electricity capacity exists on the premises. An Eskom substation next to the site could supply in the future demand if required.

The network and smaller on-site substations will be upgraded as priority to ensure sustainability in supply on the premises.

1.5.3 Risks electricity

No risks foreseen with electricity supply, however this will have to be verified with the due diligence evaluations.

1.6 ROADS AND STORMWATER

1.6.1 Current status roads and stormwater

Roads - An integrated road network is seen as a main drivers of economic development and spatial integration in Mbombela. The IDP for MLM confirmed that attention should be given to congestions in the Nelspruit CBD-Roads and parking areas. A master plan will be initiated to upgrade all these services to accommodate future developments such as the new university in future.

Stormwater – The intensity of the rainfall has increased over the past few years and storm damages are increasing annually. A catchment management strategy is initiated by the MLM to deal with storm water management and to determine the impact of 1:100 year flood-lines of all the rivers and streams in the municipal area on development.

1.6.2 Future Planned roads and stormwater

Roads – On-site road layout will form part of the campus developments. Access onto the municipal road will be controlled access. Special attention will have to be given to the intersection of this road with the already busy R40 and for alternative access into the Nelspruit CBD underneath the N4. The Mbombela Roads Department has conceptual design proposals to address this problem.

Stormwater – the existing LAC site has basic stormwater infrastructure. The topography will assist with the management of surface water runoff, however the following should be considered in the layout and design:

- The already high water table in the low lying areas of the proposed campus will restrict the use of permeable paving

- Steep contours should be considered to prevent erosion, sediment on paved areas and water damage during high rainy periods
- The low lying wetlands will be able to polish contaminated water, however discharge points will have to carefully designed (prevent concentration points) not to damage the wetland.

Management procedure for operations and maintenance of surface water will be developed for the campus.

1.6.3 Risks roads and stormwater

The identified risks are:

- access control into the campus and conflict of traffic control at the R40 intersection, will be taken into consideration during the design
- high water table in the low lying areas of the new campus in an area which is currently being used for agriculture. Sport fields or any other development in these areas could be inundated by groundwater should the subsurface drainage become redundant
- Stormwater management on the relatively steep slope site. 1 in 50 year floodlines should be done as part of the stormwater management design.

All these risks could be managed through innovative designs.

1.7 TRANSPORT

1.7.1 Current Status and planned transport

The Municipality has an Integrated Transport Plan which was approved by Council in 2007. Public transport services in the Mbombela Local Municipality are provided by means of buses and minibuses (taxis) of which three quarter of the people are using buses. BusCor is the major bus operator and some 1000 minibus taxis are operating within the municipal area. Mbombela has through 2010 FIFA World Cup learned ways of managing the transportation programs such as park and ride and controlling the taxi industry. These lessons learnt will also benefit transport around the campus in terms of public transport services to and from the campus.

Bus and taxi ranks in Nelspruit are well located in the Nelspruit CBD and commuters from the campus will have quick access to commercial and trading facilities by using these services. The R40 which passes the campus site will form a prominent route of commuters travelling between the White River region and Nelspruit.

There is a fully fledged international airport in Mbombela, the Kruger Mpumalanga International Airport (KMIA) which is run by ACSA and service flights to Zimbabwe and Mozambique. This will be ideal for students travelling from Africa states to use this facility.

The use of NMT will be encouraged for use on the campus.

1.7.2 Risk transport

No risks with respect to transport.

1.8 SOLID WASTE

1.8.1 Current Status and planned waste management

The LAC deals with its own solid waste – which poses some challenges.

Mbombela Local Municipality has an Integrated Waste Management Plan dated 2010. There is a need to extend waste collection service towards Hazyview to service un-serviced households. Shortage of staff (general workers) to service the entire Municipality is leading to an unclean environment, also due to uncontrolled illegal dumping of waste in all open areas and road sidewalks.

Nelspruit landfill site has reached its life span in terms of the air space for waste disposal. Plans are being implemented to address this issue in Mbombela.

The municipality has also completed the development of a centrally located disposal site which will among others address illegal dumping. A separate collection site will have to be developed on the campus from where the waste can be collected. Enpact Environmental Consultants has been appointed for the permitting and development of waste transfer stations in the Municipal area. They should also be made involved with this facility on the campus.

The University should introduce waste minimization which would assist the municipality with their efforts in waste minimization and recycling which seeks to reduce the tonnage of waste reaching the landfill sites. This could also create jobs for those who are interested to participate in recycling program. Mbombela is participating in the Extended Public Works Program (EPWP) to create jobs as part of their job creation programme.

1.8.1 Risk in Waste Management

There is no risks foreseen that will not be handled within current waste removal operations.

1.9 GEOTECHNICAL

No visible geological problem areas could be observed. High ground water table on the lower lying areas (south and west) will have to be taken into consideration into design of buildings and sport facilities), especially with respect to long term management.

Annexure A – position of existing bulk services on the Lowveld Agricultural College site