

3. INFRASTRUCTURE SERVICE LEVELS (BULK AND INTERNAL) AND GAPS

The focus of the National Governments Reconstruction and Development Programme is to address service backlogs and create parity within the South African society. This is implemented through the Integrated Development Plans, which assess service levels at grassroots level and align municipalities' budgets towards areas of need. The previous Empangeni Municipality and Richards Bay Local Authority were extremely successful in addressing service backlogs and providing previously marginalised communities in their supply area with basic services. The culture of non-payment has also been almost completely eradicated. The rural areas are however severely affected by a lack of basic services. Please refer to **Water and Sanitation Plan** (overleaf).

The following backlogs to RDP standards are applicable to the municipalities within the uThungulu District Municipality (KZ28):

MUNICIPALITY	POPULATION	% WATER BACKLOG	HOUSEHOLDS	% SANITATION BACKLOG
Mbonambi	96 497	92.7	14 113	97
uMhlatuze	196 183*	38.1	38 344*	47.2
Ntambanana	72 727	95.4	10 115	99.8
uMlalazi	231 023	81.2	35 247	92.2
Mthonjaneni	36 848	84	5 461	90.1
Nkandla	129 513	91.9	19 504	98.9
uThungulu	762 791	72.8	122 784	87.5

(uThungulu Water Services Development Plan, Discussion Document, December 2001)

*These figures are based on the Demarcation Board's figures. According to the City of uMhlatuze's figures, the population is 325 000 persons and 63 521 households.

In comparing the percentage backlogs of the various local municipalities, it is clear that the service backlogs in the City of uMhlatuze is considerably lower than in the other local municipalities. The large population size of the City of uMhlatuze (which is deemed as an under-estimate) however indicates that there is a very large number of people without access to basic services, which should be kept in mind in the distribution of funds from the uThungulu District Municipality between the local municipalities.

BACKLOGS TO IDP STANDARDS IN ONLY THE RURAL AREAS OF THE MUNICIPALITIES			
MUNICIPALITY	RURAL POPULATION	% WATER BACKLOG	% SANITATION BACKLOG
Mbonambi	93 857	98	93
UMhlatuze	55 843*	92	85
Ntambanana	72 727	97	98
Umlalazi	211 868	93	88
Mthonjaneni	33 025	98	93
Nkandla	125 304	97	84
uThungulu	592 624	96	89

(uThungulu Water Services Development Plan, Discussion Document, December 2001)

*These figures are based on the Demarcation Board's figures. According to the City of uMhlatuze's figures, the rural population is 162 500 persons.

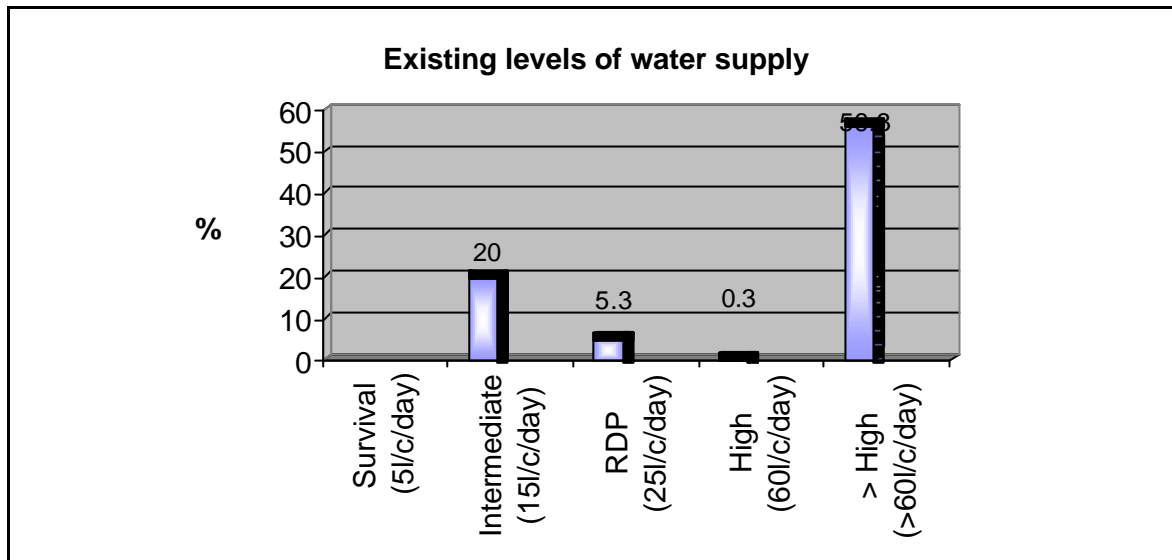
It is clear that within the City of uMhlatuze, the most significant backlog still prevails in the rural areas. The backlogs for water and sanitation are almost on par with the other local municipalities and close to the average for uThungulu.

3.1 WATER

3.1.1 STANDARDS

The standard for water provision in terms of the Reconstruction and Development Plan and White Paper on Water Supply and Sanitation is 25 litres per person per day, within 200 metres walking distance.

The graph below provides an overview of the existing level of service provided within the City of uMhlatuze.



(uThungulu Water Services Development Plan, Discussion Document, December 2001)

As can be seen from this graph, 38% of the people in the City of uMhlatuze can be classified as being below the RDP standard, while 56.5 % of the people are above standard. According to the population figures used by the municipality, this means that 123 500 people do not receive adequate water, while approximately 65 000 people are considered to be below survival level.

It is recognised that access to basic services is a human right, but water is a scarce resource, particularly in South Africa with general low levels of rainfall, therefore water resources should be used and managed in a sustainable manner. The principle of “some for all rather than all for some” emanating from the White Paper should be applied in water provision and management.

3.1.2 BULK WATER PROVISION AND CAPACITY

The Mhlatuze Water Board is the main service provider for bulk water supply in the sub-region. The Goedertrouw Dam on the Mhlatuze River, close to Eshowe, is the main source of bulk water in the region. The water supply is also augmented from the Thugela River. Presently, raw water from the Goedertrouw Dam is pumped from the Mhlatuze River to Lake Nsezi, which is used as a storage reservoir.

3.1.2.1 Empangeni

Bulk water supply to Empangeni was previously pumped from a purification plant on Lake Nsezi, some 7km to the northeast of Empangeni. Within Empangeni there are 4 reservoir installations providing storage capacity as detailed in table 18 below.

RESERVOIR CAPACITY WITHIN EMPANGENI	
RESERVOIR	CAPACITY (m ³)
Magazulu	8 850
Lofteims	3 170
Pearce	8 845
Hillview	5 000

uMhlatuze Water commissioned the construction of a new pumpstation and rising main to Empangeni during 1999. Shortly thereafter Empangeni decommissioned and abandoned their treatment facility. Bulk water supply to Empangeni is from Mhlatuze Water's Nsezi works in terms of an agreement between Mhlatuze Water and the municipality.

3.1.2.2 Ngwelezane

The Ngwelezane bulk supply system was constructed by the KwaZulu Government during the 1970's with capacity of 4 000 kl/day. The system was later augmented with construction of an identical plant adjacent to the original. The present capacity is now 8 000 kl/day. The 4 000 kl/day extension was done in 1984/1985 and a new river intake was constructed on the left bank of the Mhlatuze River.

During the 1983 Demoina Flood and subsequent floods in 1987 the inlet structure suffered damage to the inlet screens and steel structure. The water level during these floods was approximately 6 meters above the concrete structure. A temporary system was thus devised, whereby submersible pumps are suspended on the outside of the structure. This system is currently still in operation. Large quantities of sand are however entering the pumps, causing rapid wear. Sand also needs to be removed at the inlet works to the treatment plant. Water is abstracted from the Mhlatuze River.

The bulk infrastructure consists of:

- Temporary raw water inlet works.
- A treatment plant consisting of two (2) identical modules.
- High lift pumpstation.
- Dual rising mains.
- Reservoirs of combined capacity – 13,4 Ml.

The scheme is currently operated by Water and Sanitation Services (Pty) Ltd and ownership of the system resides with DWAF and payment is made by uMhlatuze Municipality. Prior to July 1997 demand was on average 8 000 to 8 500kl/day. The former Empangeni TLC embarked on a project to upgrade the reticulation and install household meters during 1997, which resulted in a significant reduction in demand. Within a short period of time, demand reduced to 6 000 kl/day. Present demand is approximately 4 200 kl/day, which represents 50% of the bulk supply scheme's capacity.

3.1.2.3 Magazulu/Empangeni – Ngwelezane Link

During 1998 the former Empangeni TLC constructed a pipeline to link Empangeni's bulk supply reservoirs at Magazulu with the Ngwelezane bulk reservoirs. This pipeline, which was financed with CMIP funds, was required for the Madlebe rural water supply scheme. The pipe consists of a 4 800m - 450mm ø AC gravity main. Connections for the Madlebe scheme are situated midway between Magazulu and Ngwelezane and at the Ngwelezane reservoirs. The main was designed to supply both Ngwelezane and the Madlebe Tribal Area. Future plans are to abandon the Ngwelezane Water Works and supply water in bulk with this pipeline to Ngwelezane. The projected demand for Madlebe is 1 800 kl/day. Present

consumption is 1 244 kl/day. It is presently possible to supply Ngwelezane from the existing Ngwelezane treatment plant or gravity feed from Magazulu Reservoirs in Empangeni (uMhlathuze Municipality, February 2002).

3.1.2.4 Richards Bay

Richards Bay obtains its water from Lake Mzingazi. There is a water purification plant situated next to the lake, where water is provided from to the entire Richards Bay town. The only exceptions are Mondi and FosKor, which obtain water directly from Mhlathuze Water. Nseleni obtains water from the Nseleni River, while Esikhawini obtains water from Lake Qubu. Water is extracted and pumped to water purification plants and then distributed to the reservoirs in the region. The Vulindlela water works were recently closed and this area is also now serviced from Esikhawini.

RESERVOIR CAPACITY WITHIN THE RICHARDS BAY AREA	
RESERVOIR	CAPACITY (m ³)
Mandlazini	2 x 47.5
Meerensee	10
Esikhawini	20

The construction of a second 20 mega litre reservoir at Esikhawini is currently underway. This reservoir has to be constructed to enlarge storage capacity to enable a continuous supply of water to the rural areas of Mkhwanazi North and South. Raw water could also be obtained from Mhlathuze Water at a capacity of 20 megalitres per day, in the event of a drought or other emergency situation. The Richards Bay area therefore has sufficient bulk water capacity for the next five years, however upgrading of the industrial ring main is required. Upgrading of the bulk supply line from the Esikhawini purification works to the new reservoirs is required, as well as the intake pipe to the purification works.

There is a high-pressure tower situated in Brackenham with a pump station pumping water to this tower, from where it serves Brackenham and Aquadene.

3.1.2.5 Nseleni Bulk Supply System

The original bulk water supply system to Nseleni was constructed in the early 1970's by the KwaZulu Government. The system has since been upgraded and augmented at various stages, with the most significant augmentation during 1993/1994. This augmentation project came about with construction of the Upper Nseleni Water Supply Scheme and the system has remained unchanged since.

The various elements in the system are not well balanced with respect to capacities, due to the historical and ad hoc nature of upgrading. Annual maintenance cost is regarded as above average due to a very conservative replacement policy followed for the past number of years.

A water supply scheme from Nseleni to Kwambonambi, which includes a high lift pumpstation at the Nseleni plant and rising main to Kwambonambi was commissioned during November 1999.

The present system consists of raw water abstraction on the Nseleni river (Lake Nsese), rising mains and the water treatment plant situated on the western border of Nseleni Town. The bulk supply system is situated within the boundaries of uMhlathuze Municipality and is currently owned by DWAF. The uThungulu District Municipality constructed and are the owners of the Upper Nseleni pipeline, a section of which is within the uMhlathuze area up to

the municipal boundary (Khoza Tribal Authority). uMsekeli Municipal Support Services constructed and are the owner of the supply scheme to Kwambonambi.

Water abstraction on the Mposa River was abandoned in 1993 due to poor water quality and doubts of the sustainability of the river. A new water intake arrangement was constructed on the Nseleni River in the upper reaches of Lake Nsesse. Water levels at the intake are maintained by Mhlathuze Water with the transfer scheme from the Mhlathuze River to Lake Nsesse. Both the Nsesse Water Treatment Works and RBM abstraction are dependant on minimum levels in Lake Nsesse for abstraction. Should Mhlathuze Water in future decide not to transfer into Lake Nsesse, but directly into their plant, then abstraction scenarios would change.

It was for this reason that abstraction for Nseleni from Lake Nsesse was conditionally approved. The proviso was that abstraction would be limited and in future possibly be reliant on runoff from the Nseleni catchments. Future plans are to abandon the Nseleni Water Works and supply water in bulk with a new pipeline from Richards Bay.

The water abstraction system consists of an inlet tower with screens on the river bank with two (2) turbine pumps. Only one (1) pump is operated at a time, with the other on standby. Raw water is pumped into a raw water dam situated at the treatment plant. The capacity of the raw water dam is approximately 5 000 m³. The treatment plant is fully operational with a rated capacity of 5,2 Ml/day and is currently running at 90% capacity.

The bulk supply reservoir is situated adjacent to the treatment plant and has a capacity of 2 700 kl. An elevated prestank on site is serving the high lying areas in Nseleni township. Average total consumption is 4 800 kl/day, including Upper Nseleni. If the storage of the raw water dam is included, total storage is 39 hours, which is below the standard guideline of 48 hours minimum. Upgrading of the system is not deemed feasible.

Upper Nseleni Water Supply Scheme

The upper Nseleni scheme is an important part of the Nseleni system. It was constructed in 1993/1994 by the former Zululand Regional Council. The scheme consists of:

??A highlift pumpstation at Nseleni Water Treatment plant.

??11 300m of a 250mm \varnothing AC rising main up to the Owen Sithole connection (an agricultural college). In between on the rising main is a take-off to the Khoza reservoir (300 kl) serving the rural Bejane area.

??From the Owen Sithole connection the rising main continues for a distance of 5 400 m up to the Hlaza reservoir (500 kl). From here there are two gravity mains. One to a prestank reservoir at Ndodwane and another to the Mambuka reservoir. The Mambuka supply scheme consists of various gravity and pumping mains supplying the Mambuka area and Ntambanana settlement (outside the uMhlathuze Municipal area).

The capacity of the Upper Nseleni System is determined by the pumping capacity and the bulk rising main to Hlaza reservoir and is rated at 115 m³/hour.

The Nseleni bulk water supply scheme is presently operated and maintained by Water and Sanitation Services (Pty) Ltd. on behalf of the uMhlathuze Municipality, on behalf of the owner, DWAF (uMhlathuze Municipality, June 2001).

3.1.2.5 Esikhawini Bulk Supply System

The Esikhawini water treatment works rely on a dual system for the supply of raw water. The two (2) sources consist of Lake Cubhu and the Mhlathuze River. The system from the Mhlathuze River is operational and will only be utilised should Lake Cubhu fail during a drought.

Historically Esikhawini relied on Lake Cubhu as water source. The lake has a quoted yield of 30 MI/day determined during the 1970's. Serious problems were however experienced during the 1993/1994 drought with low lake levels, after which it was decided to augment supply from the Mhlathuze River.

The scheme for the Mhlathuze River was implemented as part of the Iscor Mining water supply scheme, which was completed in June 2001. In general Lake Cubhu will be utilised for as long as possible, except during severe drought, due to lower costs. Abstraction from this lake is furthermore under gravity conditions whereas supply from the Mhlathuze River is via a pumping scheme.

The bulk supply system covers a large area with Lake Cubhu as its principal source. The furthest point of supply is the Vulindlela reservoirs which are approximately 16 km from the treatment plant, which is situated on the southern shore of Lake Cubhu. The bulk supply system was constructed during 1972/1973 and has been augmented with the latest addition in 1996 of sedimentation tanks at the treatment plant. The Esikhawini reservoir was relocated during 1997/1998, due to its location on the Iscor Mining lease at Hillendale.

Abstraction from Lake Cubhu exists of the following:

- A reinforced concrete inlet structure located approximately 30m from the shoreline in approximately 2,5 m water depth.
- Connected to the inlet structure is a 600 mm concrete pipe to the treatment plant inlet screen. Flow is under gravity conditions.

The capacity of the system is determined by the lake level. The rated capacity is 720 m³/hour. It is sufficient for average flow conditions, but cannot cope with peak flow requirements. Low lake levels will reduce capabilities even further. There are currently three (3) off low lift water pumpsets, designed for two (2) duty and one (1) standby. A tender has been allocated to improve the capacity of the intake works.

The Esikhawini treatment plant is generally in a good condition and fully operational. The plant has a rated capacity of 18 MI/day under moderate conditions. The rising main from the treatment plant to the bulk supply reservoir consists of two sections, namely:

- Section 1 from the treatment plant to Hillendale (length 5 200 m); and
- Section 2 from Hillendale to the reservoir (length 5 100 m).

Section 1 has been in operation since 1974 and has been experiencing pipeline failures. Section 2 was commissioned during January 2000. The pipe was designed to cater for future demand and would therefore be sufficient for some time. Tenders were called in February/March 2002 for the replacement of Section 1.

The principal reservoir is situated midway between Esikhawini and Vulindlela, with capacity of 20 MI. The reservoir feeds both townships with secondary reservoirs at Vulindlela township. The combined capacity of the Vulindlela reservoirs are 3,5 MI which exclude an elevated tower with insignificant storage. Water is pumped to the elevated tower on site to provide sufficient pressure to the University of Zululand. The system is operated

independently from the Esikhawini reservoir. The actual reservoir storage is however below standard (averaging between 27 and 32 hours rather than 48 hours to 52 hours). The bulk supply infrastructure and links are extensive with 20.5 km of pump gravity mains. The norm of 48 hours should therefore be the minimum. Gravity mains are in operation and in good condition, with sufficient capacity to handle peak flows (uMhlatuze Municipality, June 2001). A second 20MI principal reservoir is currently under construction to alleviate the above-mentioned problems.

Bulk and internal supply to the rural areas are dealt with under Section 3.1.3 and 3.1.4.

3.1.3 INTERNAL WATER PROVISION AND CAPACITY

Internal water supply falls under the responsibility of the uMhlatuze Municipality. Water supply to the individual houses is based on internal, house connections. Within in Ngwelezane, Esikhawini, Vulindlela and Nseleni the former Department of Public works of the KwaZulu Government was responsible for the internal reticulation of the township. The responsibility was shifted to the former local councils and now resides with the uMhlatuze Municipality. All the households in the urban areas of the City of uMhlatuze have access to water supply at individual erf level through metered connections. There is therefore no backlog in the urban area, except for Mzingazi Village and small portions of Ngwelezane.

The municipality adopted a policy in November 2001 for the delivery and maintenance of water services in the rural areas of the City of uMhlatuze. The policy put forward, inter alia, the following recommendations:

- The amount of free water to be fixed at 6 kl per household per month;
- The principle of Service Level Targeting be accepted;
- The final level of service to be a standpipe for every household in the rural areas and a standpipe on each stand in the semi-urban areas;
- Meters be installed immediately for all high usage users and normal billing and credit control be done;
- Restrictors be installed to limit flow to 200 litres per day per household if no water meter is installed;
- Storage tanks on sites to be provided by users at their own cost;
- Households who want to connect to the water reticulation network can do so, provided that a pre-paid water meter be installed and the cost for the connection and meter to be for the user;
- The supply of water to schools be given high priority;
- Where standpipes are installed, it be installed within stands where it is possible to improve security and rule out vandalism to standpipes;
- Quotations be called for the installation of restrictors at un-metered connections in rural and semi-urban areas;
- The policy will be workshopped with communities in rural areas.

This policy is in line with the directive from national government to provide every household in South Africa with 6 kl of free water per month. This is based on the World Health Organisation Standard of 25 litres per person per day and assuming eight (8) people per household, implying 200 litres per household per day. The implementation of water schemes and any water projects in the rural areas will have to abide by this policy.

The following specific recommendations were made for each tribal authority:

TRIBAL AUTHORITY	IMMEDIATE ACTIONS	ULTIMATE GOAL
Dube and Khoza Tribal Authority	• Install meters for large volume users. e.a.	• 200 litre tank on each stand.

	schools, businesses. ☞☞ Install restrictors and pressure reducing valves to reduce flow.	☞☞ Control valves. ☞☞ Remote meter reading.
Mkhwanazi South Tribal Area	☞☞ Read meters at large volume users. ☞☞ Restrictors.	☞☞ Remote meter reading.
Mkhwanazi North Tribal Area	☞☞ Install communal standpipes and restrictors.	☞☞ Yard connection (200 litre tank and control device)
Madlebe Tribal Area	☞☞ Install meters for large volume users. ☞☞ Restrictors.	☞☞ Yard connection (200 litre tank and control device)

(Policy adopted by the uMhlathuze Municipality on 20/11/2001).

3.1.4 PROJECTS RECENTLY COMPLETED AND CURRENTLY UNDERWAY

3.1.4.1 Proposed Felixton Village – Bulk Supply of Water

Tongaat-Hulett Properties Ltd applied for the establishment of a private township. The following options for water provision were considered:

- ☞☞ Via a 200mm diameter pipeline from Esikhawini to Felixton with a 450kl reservoir.
- ☞☞ A 110mm diameter pipeline from Esikhawini to Felixton making use of the existing 400kl reservoirs as well as the provision of a pressurised pumping installation.

It was deemed that the 200mm diameter pipeline would be more feasible as it allows for peak flow conditions. Alternatively a 315mm pipeline could be installed that would also cater for the demand of Mondi and Felixton Mill. Industries located adjacent to the Felixton Village indicated that they would not require potable water from the municipality, however the continuous purchase of water by Mondi from Tongaat-Hulett needs to be regularised in terms of the municipality's by-laws and applicable legislation.

It was however decided that the 200mm diameter pipeline from Esikhawini to Felixton with a 450kl reservoir be provided by the developer, to the satisfaction of the municipality (uMhlathuze Municipality, Report dated 20/11/2001).

3.1.4.2 Madlebe Tribal Authority

The Madlebe Community Water Supply Scheme provides water to eleven (11) tribal sub-wards. Mhlathuze Water, acting as implementing agent for the Department of Water Affairs and Forestry (DWAFF), fulfilled the role of project manager and monitored the implementation process. The parties involved in the project are:

- ☞☞ Department of Water Affairs and Forestry;
- ☞☞ uMhlathuze Municipality;
- ☞☞ Mhlathuze Water;
- ☞☞ Madlebe Tribal Authority; and
- ☞☞ Madlebe Amanzi (local water committee).

The scheme comprises two (2) areas, both of which source their bulk purified water from the uMhlathuze Municipality via two bulk prepaid meters feeding 300kl and 200kl reservoirs respectively. The network through the Madlebe area includes fourteen (14) smaller reservoirs connected to 190km of reticulation which in turn distributes water to 268 metered standpipes in the north and 220 metered standpipes in the southern area, serving 2 260 households. The total cost of the project is in excess of R18 million.

The scheme is in the final stages of completion, bringing water on average to between 100m and 200m from each household. With the emergency Cholera Intervention Programme a further 250 standpipes were installed, bringing the total number of standpipes to 728, i.e. averaging three (3) households per standpipe. Madlebe Amanzi has indicated that they wish to retain ownership of the reticulation and distribution of water and that uMhlathuze Municipality would take over the pump station, rising main and reservoir.

Inthuthuko Consulting Services, appointed by the municipality, have already started with consultation on the Council's policy on rural water supply. A further R600 000.00 was also allocated by the uThungulu District Municipality to finalise the scheme, i.e. minor extensions and standpipes (uMhlathuze Municipality, Report dated 16/11/2001).

3.1.4.3 Khoza Tribal Authority

In the Mazimazane Ward of this Tribal Authority Area the uThungulu District Municipality appointed consultants to design and implement an approved water supply scheme for the Mazimazane Ward. This project was applied for on behalf of the Mazimazane Community and an amount of R600 000.00 was approved by the former uThungulu Regional Council in the 2000/2001 budget.

The Project Steering Committee approved the Business Plan and granted approval for the proposed scope of work and method of implementation. The Steering Committee will also ensure that the interests of the community are represented during the implementation of the project.

This project is located on the outskirts of Nseleni Township. As the Nseleni Bulk Water Supply Pipe traverses the area, extensive use is made of this scheme to augment the existing two (2) low yielding boreholes and the Mbabe River on the northern boundary. Storage facilities will be constructed to provide the necessary pressure for a gravity distribution system. The reticulation will be extended and communal standpipes erected as well as limited individual connections (costs to be borne by the user).

Details of the project are as follows:

- ☒ Install a metered connection point on the Upper Nseleni Pipeline.
- ☒ Construct a new storage facility with capacity of 116 kl.
- ☒ Install a gravitational supply pipe from the meter to the reservoir.
- ☒ Install approximately 6.5 km of distribution network pipes to bring water to within 250 m of each homestead.
- ☒ Install approximately 30 communal standpipes.

Construction is set to commence in January 2002.

An additional project of R600 000.00 for the above mentioned water network forms part of the above-mentioned project. These funds were granted to the municipality by the uThungulu District Municipality, to provide for additional network, distribution and storage facilities (uMhlathuze Municipality, Report dated 16/11/2001).

3.1.4.4 Mkhwanazi Tribal Area

The uThungulu District Municipality is currently implementing the Inthuthuko YamaShamase Water Project in the Mkhwanazi North Tribal Area. It is situated to the southwest of the University of Zululand approximately 15 km from Empangeni. The project was done in two (2) phases, namely bulk services as phase 1 and reticulation as phase 2. The first phase has

been completed and the second phase will commence in the 2001/2002 financial year. The project provides the following infrastructure:

PHASE 1	PHASE 2
A bulk water connection to the reticulation network at KwaDlangwesa supplied by the uMhlathuze Municipality.	Construction of valve boxes and additional meters to facilitate management.
Seventeen (17) reservoirs with a total storage of 650 m ³ .	Installation of connection points on the main lines including meters and meter boxes.
A total of 88,6km bulk supply pipelines	The installation of approximately 14 km of reticulation piping.
A highlift pump station with 2 x 7,5 kW pumps.	The installation of approximately 60 communal standpipes.
Total cost: R5 400 000.00 (approximately) VGC Consulting Engineers Inc. 2001 and uMhlathuze Municipality, 2002	Total cost: R600 000.00 (approximately)

A total of approximately 1 452 additional households or approximately 14 000 people will be reached by this project. Water will be provided to households within a 500 m radius from the proposed standpipes. Individual erf connections will not be provided (VGC Consulting Engineers, 2001).

The uMhlathuze Municipality also appointed consulting engineers to do detail design and call for tenders for the water network in the Mkhwanazi North Tribal Area. The contract work was set to start during the beginning of March 2002. The funds for this project is from the Consolidated Municipal Infrastructure Programme (CMIP) and amounts to R485 000.00 with a further R160 000 from the uThungulu District Municipality. This project is set to be completed by the end of June 2002 (uMhlathuze Municipality Report dated 20/11/2001).

The water network in the Mkhwanazi South Tribal Area was completed in early 2002. Another project is currently underway in the area to introduce control measures in the form of restrictors and storage tanks for individual sites. The CMIP provided R450 000.00 for this project (uMhlathuze Municipality Report dated 20/11/2001).

3.1.4.5 Mzingazi Agri Village and adjacent Mbonambi Tribal Area

Consulting engineers were appointed as project managers on behalf of the uThungulu District Municipality. They have called for tenders for a water reticulation system for the Mzingazi Agri Village and adjacent Mbonambi Tribal Area. The project is set to commence in January 2002. It will be funded by DWAF through the District Municipality to an amount of R5 700 000.00 (uMhlathuze Municipality Report dated 20/11/2001).

3.1.4.6 Water Services Development Plans

The uThungulu District Municipality and uMhlathuze Municipality are in the process of formulating Water Services Development Plans. This is a legislative requirement on municipalities to ensure that statutory directives from national government are implemented at local level. The Plan also addresses the required minimum levels of service (in accordance with legislation) and the financial feasibility of achieving these levels. It puts forward a five (5) year plan for the provision of water and sanitation services.

uThungulu District Municipality's Water Service Development Plan deals with the following issues:

- Legislative Framework;
- Level of Service Targets;

- ☞☞ Tariffs and Cost Recovery;
- ☞☞ Design Standards;
- ☞☞ Operation and Maintenance; and
- ☞☞ Bylaws.

The uThungulu Water Services Development Plan (Discussion Document, November 2001) found that the achievement of the required level of services will not be possible within the next five (5) years. A reduced level of service is therefore recommended, namely:

☞☞ **Water:** To provide at least 90% of the population with water at a volume of 5l/c/day within 1 000m of their place of residence as a first objective and, as a secondary objective, to provide at least 35% of the population with water to the RDP level of service, being 25l/c/day within 200 m of their residence.

☞☞ **Sanitation:** To provide basic health hygiene to at least 90% of the population and to provide at least 25% of the population with sanitation facilities at least in the form of a VIP latrine.

The uMhlathuze Municipality initiated the formulation of a Water Service Development Plan during 2001. It is currently in its first phase (information gathering) and will be completed by the middle of 2002.

3.1.4.7 Industrial Water

The Municipality now also provides clarified water to industries, instead of purified water. The clarified water will be approximately 25% cheaper than purified water and this tariff includes costs to recover the capital outlay of approximately R16, 7 million.

3.1.5 RESOURCE OPPORTUNITIES AND CONSTRAINTS

3.1.5.1 Pressures

☞☞ The rapid population growth and the need for development through economic activities leads to greater water demand and increased pollution of available resources. (DEAT, 1999). As the consumption user demands of industrial and urban development rise, so too will the proper functions of the freshwater resources within the study area be threatened.

☞☞ There is very little or no reticulated water supply to some of the rural settlements on the outskirts of the urban areas. For example people living within the Tribal Areas make use of untreated water from boreholes and springs. Currently plans are under-way to supply water to this area (Vuka Town and Regional Planners, 1999). It is not known where communities in all the Tribal areas get their water from (Hattingh & Fairley, 2000).

☞☞ The demand for water does not necessarily coincide with the spatial distribution of water e.g. the water use by the catchment's rural population of about 273 000 was estimated at approximately 1.4 million m³/annum in 1995. This is very low but is consistent with the low level of water services at that time. As water supply infrastructure is put in place, the unit consumption will no doubt increase and it is assumed that it will eventually increase to about 60 litres/person/day. Assuming target rates of 25l/person/day and 60l/person/day for the medium and long term respectively, the total water requirement of the rural community is still very low when compared with other consumers (Mallory, 2000).

- ☞☞ The scarcity of water is also exacerbated by gradual pollution of the surface and groundwater resources due to urbanisation and agriculture.
- ☞☞ There are indications that the surface water quality may be impacted to some extent by development in the currently developed areas. Development may lead to increased storm water run-off should adequate precautions not be taken.
- ☞☞ Cemeteries also pose a potential pollution problem. Waste disposal sites in Richards Bay are classified as B+ (potential for leachate generation) due to the climate. Leachate from waste disposal sites can result in the following impacts on ground water: an increase in electrical conductivity, potassium, chloride, sulphate, metals, and chemical oxygen demand (COD). (CSIR, 2000). The use of fertilizers, pesticides, and insecticides from agriculture may result in an increase in nitrates and organics in the ground water (Strategic Environmental Assessment, 2002).

3.1.5.2 Recommendations

- ☞☞ Although not comprehensive some monitoring is being undertaken for some of the water resources within the area, a comprehensive monitoring programme is needed.
- ☞☞ The Department of Water Affairs and Forestry have recently completed a Strategic Environment Assessment for water use within the Mhlathuze catchment. This report contains information on water resources, which is important for future planning in this area (Strategic Environmental Assessment, 2002).

3.1.5.3 Key Issues and Information Gaps

Key Issues for Sustainable Environmental Management

- ☞☞ The uses of the inland lakes in the area are becoming increasingly multi-purpose as the demands of industrial and urban development increase. The biotic diversity, limited area coverage, and their generally pristine state means that these lakes and wetlands are extremely valuable assets in terms of their recreational/tourist potential in addition to their critical ecological role within a river basin.
- ☞☞ Surface water resources within the area appear to be very limited, increased demands on the natural resources may not be possible.
- ☞☞ Legal issues will have a major impact on the way industrial pollution is controlled and managed in the area. The Water Act (1998) regulates the way in which municipalities and industries operate. Other agencies, such as the Water Boards, are empowered to enforce monitoring programmes in the application of the “polluter pays principle” (Strategic Environmental Assessment, 2002).

Information gaps

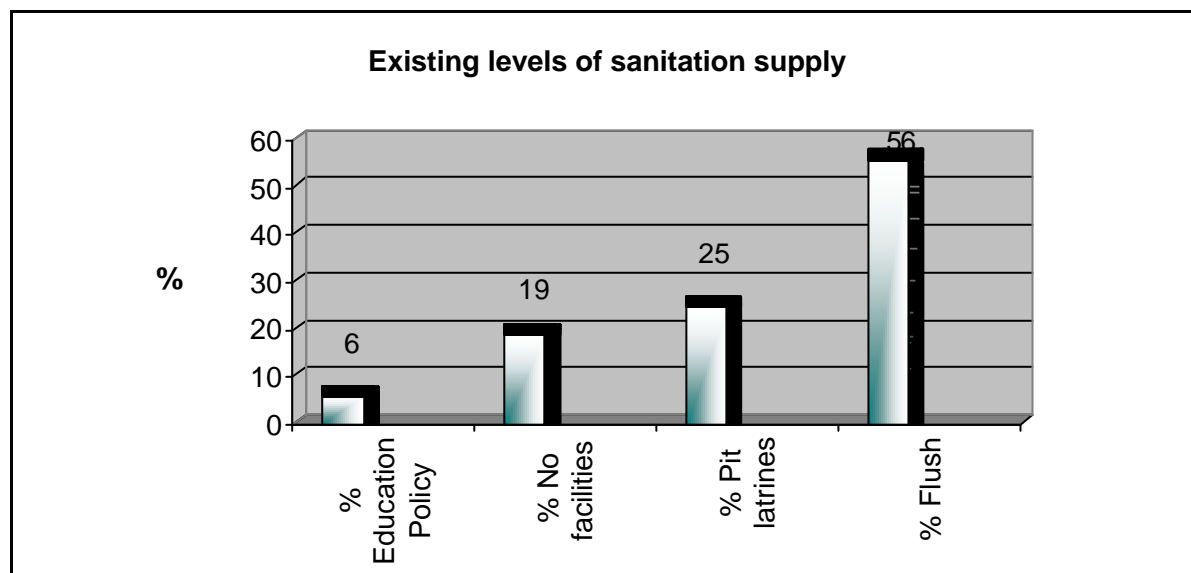
- ☞☞ There is a shortage of data relating to both the quality and quantity of surface and groundwater within the rural portion of the study area. There are indications that borehole yields as well as borehole quality places a limitation on groundwater resource availability, but this need to be verified based on a larger database collated throughout the entire study area.
- ☞☞ The implications of increased run-off from developed areas, sediment loads and changes in water chemistry on downstream ecological systems need to be monitored in all areas.

- ✂✂ Information is required on the impact of sugar cane cultivation on the water resources.
- ✂✂ A comprehensive water quality-monitoring programme is needed for the study area.
- ✂✂ The impact of landfill sites in the area on the groundwater resources needs continuous monitoring.
- ✂✂ Further studies including the ecological implications of variations in flow rates, sediment loads and water chemistry on the Mhlathuze River, in the Mhlathuze Estuary and Lake Nsezi will be required to fully understand the implications of development on systems on the Mhlathuze catchment.
- ✂✂ The implications of changes in water chemistry, sediment loads and variations in flow for the functioning of ecological systems within the rivers and lakes and the Mhlathuze Estuary needs to be determined in terms of their ecological reserve requirements.
- ✂✂ Catastrophic event such as droughts and floods will affect the sustainable supply of water (Strategic Environmental Assessment, 2002).

3.2 SANITATION

3.2.1 STANDARDS

The standard for sanitation provision put forward by the Reconstruction and Development Plan and the Water Supply and Sanitation Policy White Paper, is a ventilated improved pit latrine (VIP), constructed to acceptable standards and properly maintained. This standard recognises the need to provide people with basic services to meet basic health and functional requirements, including protection of the quality of service water and underground water. The scarcity of water as a natural resource is also acknowledged.



(uThungulu Water Services Development Plan, Discussion Document, November 2001)

The fact that approximately 50% of the population has access to waterborne sewer is a positive fact from an environmental health point of view. Approximately 25% of the population makes use of pit latrines, although it is not clear if these comply with the RDP standards. Approximately 25% of the population do not have access to proper sanitation facilities.

3.2.2 BULK TREATMENT WORKS AND CAPACITY

The distribution of sanitation infrastructure closely follows that of water within the sub-region. Within the sub-region the Empangeni and Ngwelezane sewerage treatment plants comprise two of the existing five works. The Empangeni works functioned at a capacity of approximately 8,6 mega litres per day in relation to a design capacity of 11 mega litres per day. During the 1993 financial year a contract was awarded for the extensions to the Empangeni sewerage works, the scope of the work including the construction of a raw primary sedimentary tank as well as an extension to the sludge drying beds. The capacity of the works was extended and completed in the 1993 / 1994 financial year which was aimed to cope with the natural growth of the town and the development of new townships up to the year 2000. Further extensions would increase this capacity to account for approximately 9.5 mega litres per day.

Richards Bay has two (2) macerator stations for sea disposal of sewerage. The one is situated between Arboretum and Meerensee and functions at a capacity of approximately 10 mega litres per day. This plant was recently upgraded and treats the domestic sewer of Richards Bay. The second is situated at Alton and handles the sewer effluent from the industrial areas, and functions at a capacity of 5 mega litres per day. These plants are considered to have sufficient capacity for the next two (2) years.

Richards Bay's sewerage effluent is pumped into the sea via pipelines from Mhlathuze Water, whereas Empangeni's is treated and discharged into a small stream. The purification plant in Ngwelezane has a capacity of 5,8 mega litres per day, although currently the plant is treating approximately 2,6 mega litres per day and has sufficient medium term capacity.

The Esikhawini purification plant has a capacity of 21 mega litres per day and is currently operating at 90% capacity. Purified water from the plant gravitates in a natural stream towards the coast. The Vulindlela purification plant has a capacity of 2,8 mega litres per day and is currently operating at 47% capacity. Treated water gravitates to the Mhlathuze River. The Nseleni purification works gravitates water to the Nseleni River. The plant has capacity of 3 mega litres per day and operates at 25% capacity. Treated water is pumped into the Mposa River.

3.2.3 INTERNAL RETICULATION AND CAPACITY

Empangeni, Richards Bay, Ngwelezane, Esikhawini, Vulindlela and Nseleni are serviced by a water borne sewer reticulation network, draining to the low lying areas, where sewer pump stations, through rising mains, pump the sewerage to the sewerage treatment works. The urban areas have a full water borne sewerage system. Richards Bay's treated water is pumped into the sea and Empangeni's treated water is pumped into a river.

Within the tribal areas there are no formal or planned sanitation systems with VIP latrine systems being utilised in some areas. The planning of suitable sanitation systems is therefore essential. Most of the farms within the former "R.S.A." areas have septic tanks, while some of the rural communities and farm labourers use pit latrines or simply the open bush.

3.2.4 PROJECTS RECENTLY COMPLETED AND CURRENTLY UNDERWAY

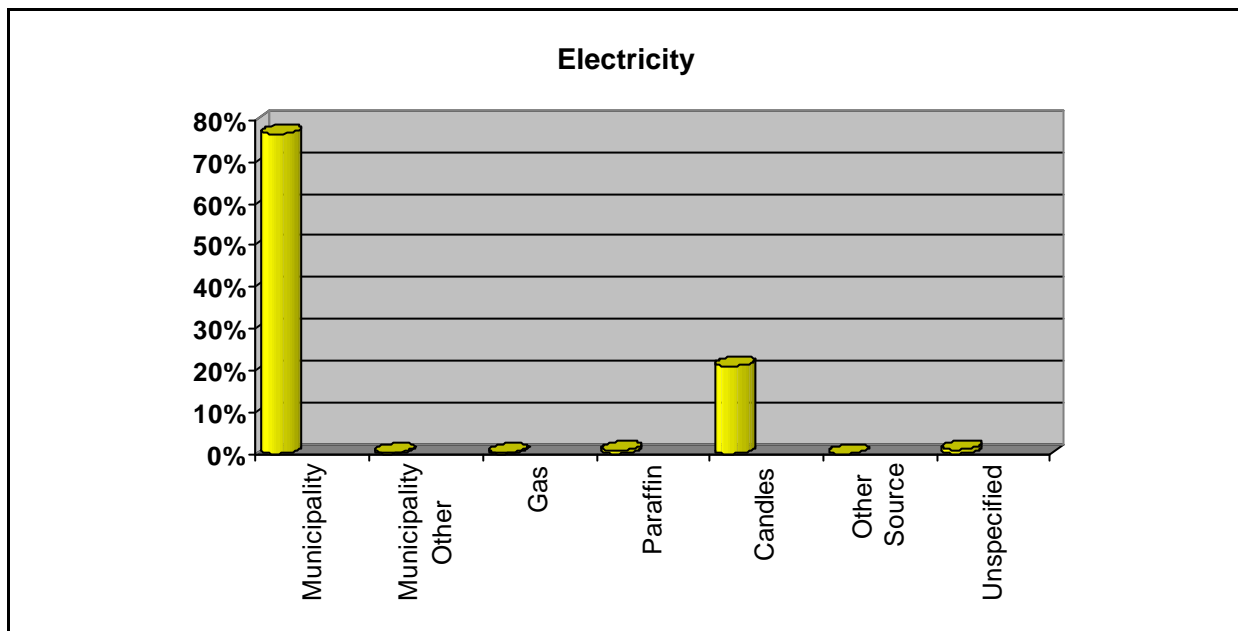
To address the cholera epidemic in the region, the Minister of Water Affairs and Forestry awarded a R24 million grant for the provision of water and sanitation infrastructure in the uThungulu, uMkhanyadude and King Shaka Districts as part of the cholera intervention emergency plan. The Madlebe area in the City of uMhlathuze is benefiting from this, with a R3 million sanitation project, to extend the existing system.

The provision of water through containers, provision of Jik and distribution of toilets was also implemented as emergency measures to address the cholera epidemic in the region. The uMhlatuze Municipality is currently concentrating on the provision of water to the rural areas as first priority, therefore it is not currently undertaking any sanitation projects.

An investigation into the extension of the Empangeni wastewater treatment works situated in Copper Drive in the industrial area is to be undertaken. The plant is reaching design capacity and with increasing flows from Iscor, the extension of the plant or construction of a new facility is to be evaluated.

3.3 ELECTRICITY

3.3.1 STANDARDS



Demarcation Board, 2001

The graph above indicates that most people in the City of Umhlatuze area have electricity in their homes, supplied by the local authority. This is however questionable, seen in light of the fact that Eskom supplies electricity to households outside the former Empangeni and Richards Bay areas, which constitutes approximately 50% of the population of the area.

According to the City of uMhlatuze Interim IDP, the electricity backlog in the rural area is approximately 60%, which is considerable. There is no backlog within the current licence area of the City of uMhlatuze; the areas with an electricity backlog are situated in the rural area serviced by Eskom.

3.3.2 BULK TREATMENT WORKS AND CAPACITY

Bulk electricity supply to the 11kV Empangeni and the 11kV Western Substation is provided by Eskom. Similarly, Eskom provides the bulk supply to the 11kV Ngwelezane sub-station. Richards Bay and Esikhawini receive their main 132kV electrical power supply from Eskom's Impala sub-station. The electricity supply for Nseleni is obtained from the Eskom 22kV system from Kwambonambi and the Vulindlela supply is from the Eskom supply to the Zululand University. The main electricity supply system is designed to eventually form a link or ring to Eskom's Imvubu sub-station. Eskom is the electricity supplier to the rural areas and areas falling outside the current license area of the City of uMhlatuze.

3.3.3 INTERNAL RETICULATION AND CAPACITY

The internal electrical reticulation of Empangeni and Ngwelezane falls under the responsibility of the City of uMhlathuze. From the relevant sub-station a low voltage network distributes electricity to all premises. Electricity is supplied on the basis of individual, pre-paid internal house connections.

The distribution of electricity to the various tribal areas is the responsibility of Eskom. Throughout the Madlebe tribal areas the pre-paid card system has been extended to the majority of the area. There are people throughout the area purchasing electricity on the basis of this system.

In terms of its current electricity license, the City of uMhlathuze only provides electricity to the former Richards Bay TLC area, Mandlazini and Mzingazi. There are currently large areas within the City of uMhlathuze which do not fall in the licensing area and negotiations in this regard are currently underway with Eskom. The former Richards Bay area, Mandlazini and Mzingazi are fully serviced with individual, pre-paid connections.

3.3.4 PROJECTS RECENTLY COMPLETED AND CURRENTLY UNDERWAY

The provision of electricity to the entire Mandlazini area and Mzingazi area was recently completed. The low cost housing project between Empangeni and Ngwelezane is being serviced by Eskom.

The Electrical Master Plan, 1998 prepared for the former Richards Bay Local Council estimated that the main extensions from 2000 to 2005 would be the probable creation of the Celtus, Indus, Neptune, Phoenix and Virgo substations together with expansions of the Cygnus and Hercules sub-stations. The rest of the system should have adequate capacity to handle expected growth up to the year 2005.

3.4 TRANSPORTATION NETWORKS AND LINKS

In Empangeni and Richards Bay there are well-equipped systems that consist of roadside catchpits, piping and open channel network (although not all roads have curbing), which drains stormwater run-off into natural causeways and streams. Ngwelezane, Esikhawini, Vulindlela and Nseleni have a similar stormwater system, whilst in the tribal area restricted stormwater systems exist, which result in ever increasing problems of soil erosion, drainage and flood damage.

3.4.1 ROAD AND STORMWATER NETWORK

Due to the fact that the City of uMhlathuze is the main commercial, industrial and service centre in the sub-region, most of the regional nodes converge in this centre. The N2 national highway links this centre with St Lucia to the north and Durban to the south, while the R102, which was the main road prior to the construction of the N2, also provides for north-south movement in the region. The **Transport Infrastructure Plan** (overleaf) depicts the main transport infrastructure in the City of uMhlathuze.

The John Ross Parkway (now declared a national road) and the MR231 are currently the only two east-west routes connecting Richards Bay and Empangeni and the N2 national highway. The Port of Richards Bay is also linked to its hinterland via the above-mentioned routes. There are severe problems experienced with the Johan Ross parkway, including congestion at peak periods and a high rate of fatal accidents, the road structure is also deteriorating rapidly and is susceptible to flood damage. The Richards Bay Spatial

Development Initiative also identified the current state of the John Ross Parkway as a major bottleneck limiting the economic development of the area.

Due to the lack of provincial funds, it was agreed that the SA National Roads Agency launches a process to upgrade the highway using tolling as a funding mechanism. Tenders were called for phase 1 of the upgrading of the road to four lanes with shoulders. The tender addresses the design, construction, finance, operations and maintenance of the road as a toll-highway concession contract. As planned, construction will commence in early 2003 with a construction period of approximately two to two and half years. This road is particularly significant, especially in view of the fact that it would be the main link between the Industrial Development Zone (IDZ) and the residential and industrial areas of the sub-region. It is intended to upgrade the road to six lanes during phase 2 of the construction programme. An Environmental Impact Assessment preceded the upgrading programme.

The MR231 (North Central Arterial) connects the John Ross Parkway and the N2 in the north. This road provides a link to the northern residential areas and the CBD. It is therefore one of the busiest intersections in the urban area.

The following are significant intersections along the John Ross Parkway, namely:

- ✍ MR106: Main road between Esikhawini and Richards Bay;
- ✍ Mondri Access Road, providing access to Mondri and linking with the South Central Arterial and Alumina Allee in Alton;
- ✍ Alton/Harbour Road (Geleiergang): main access to the Alton industrial area and the harbour;
- ✍ West Central Arterial: provides direct access to the Richards Bay CBD;
- ✍ MR231 North Central Arterial: links the northern residential areas to MR496 and serves as linkage from the east into Alton and the CBD areas; and
- ✍ Medway Road: serves the harbour and waterfront activity area.

The MR535 provides a direct link between the MR2 and Esikhawini.

The MR230, being the western extension of the John Ross Parkway is the main road through Empangeni and provides a direct link to the interior of KwaZulu Natal and Gauteng. The municipality maintains the area inside the former Empangeni Municipal boundaries, while the remainder of the road is the responsibility of the Provincial Department of Transport. The section of this road between Eshowe/Melmoth junction and Empangeni is in a particularly poor condition at some places and carries heavy traffic volumes and heavy vehicles. At the western entrance to Empangeni a detour is provided through the industrial area for the purpose of diverting heavy vehicles from the CBD.

Roads in Empangeni that were identified as having high levels of services were the Grantham Highway (MR2) and Main Road (MR230). Different intersections identified with high levels of use and which contribute to the flow into the CBD area and the industrial area along Tanner Road were the Turnbull-, Maxwell- and Biyela intersections and the Grantham Highway/Ngwelezane Road traffic turning circle, respectively. Empangeni and Ngwelezane are well linked in terms of main bypass road MR166 and Ngwelezane Road (M456). The roads within Ngwelezane Township are surfaced. They are however in need of consistent maintenance and upgrading.

Traffic activity within Empangeni and Richards Bay is generally high, particularly in the vicinity of the CBD and the industrial areas. Main Road (MR230) in Empangeni carries very high volumes of traffic and frequently experiences congestion. The plan overleaf depicts the **Movement Patterns** in the City of uMhlatuze and the District.

The overall condition of provincial roads in the region (outside the former towns of Empangeni and Richards Bay) is very poor, particularly local access roads used by communities in the rural areas. These roads and some of the bridges in the region, which provide access for rural communities to service centres, were damaged during periods of abnormally high runoff, creating accessibility problems.

The City of uMhlathuze expressed its concern about the lack of maintenance on provincial roads and is liaising with the Provincial Department of Transport in this regard. Although the City of uMhlathuze cannot act directly in the upgrading and maintenance of the roads under provincial jurisdiction within its boundaries, it is committed to fulfilling a facilitating role in urging the provincial government to tend to these problems.

Initiatives are also under way to downgrade some of the provincial roads to local roads, implying that it would become the responsibility of the uThungulu District Municipality and uMhlathuze Municipality to maintain, operate and upgrade these roads. The necessary funding for this would however not be transferred with the responsibilities, implying that a burden would be placed on the municipalities. It is essential that the City of uMhlathuze and the uThungulu District Municipality formulate a policy to deal with this matter.

A major problem in the area and similarly, in most municipal areas, is the fact that roads are under the jurisdiction of different authorities, with different standards and programmes applying to upgrading and maintenance. Some of the authorities do not maintain roads in their jurisdiction on a regular basis because of various reasons, including insufficient funding and manpower at their disposal. These aspects have to be streamlined to ensure that maintenance and improvements are done on the existing road network in the country to ensure roads of high quality.

3.4.2 RAILWAY NETWORK

In terms of railways the region is well served by electrified cargo / bulk line to both Durban and Vryheid. There are also branch lines, with diesel locomotives, in use from Empangeni to Nkwalini, and Empangeni to Swaziland.

The main railway from Durban to northern Zululand passes through the industrial area of Empangeni. The railway line was downgraded from a passenger service. Spoornet does not plan any extension or upgrading of the existing railway network for the near future in the uMhlathuze area, except for industrial development.

3.4.3 AIRPORTS AND HARBOUR

Of significance to the region is the well-developed airport facility at Richards Bay and the smaller airfield north of Empangeni.

The Port of Richards Bay was opened on 1 April 1976. Although relatively young, this harbour has the capacity to be developed into one of the largest ports in the world, rendering it globally competitive. The port currently handles just over half of South Africa's sea borne cargo trade.

The port was initially built to export 2.6 million tons of coal a year for the next ten years and has since rapidly developed and diversified in other cargo-handling forms. The port now handles approximately 75 million tons, including dry bulk, liquid bulk and break-bulk cargo per year. Political changes in the early nineties have resulted in a tremendous growth in international trade. The port has undertaken capacity-enhancing projects to ensure commercial success and international competitiveness of both the port and its clients. The existing infrastructure is being upgraded and will embrace cutting-edge technology. The port

has a framework that outlines future developments and facilitates long-term planning to ensure that all port-users' requirements are met.

The total land and water surface areas are 12 157 ha and 1 443 ha respectively and just half of that area is developed. This is not even taking into account future development potential if one includes the areas outside port limits, but which are earmarked for port developments.

Portnet invested R1.1 billion in Richards Bay between 1996 and 2000 and a further R730 million is planned for spending over the next three years. The bulk of the investment went towards refurbishing and upgrading the dry bulk terminal. One of the projects won a construction techniques award and received first commendation for a civil engineering project in the Fulton Awards 2001. This was the finger jetty that provides two berths, conveyer networks and two shiploaders for dry bulk exports. Capacity increase, minimised ship-waiting time and increased productivity are the expected positive spin-offs. Private developments include a dry dock facility and a fruit/passenger terminal.

Ideal location, deep-water infrastructure, specialised cargo-handling facilities, development potential and abundance of labour all combine to position the Port of Richards Bay as one of the world's leading ports in terms of high speed, high volume cargo-handling and fast vessel turnaround (Indiwe, South African Airways Express In-flight Magazine, October 2001).

3.4.4 PROJECTS RECENTLY COMPLETED AND CURRENTLY UNDERWAY

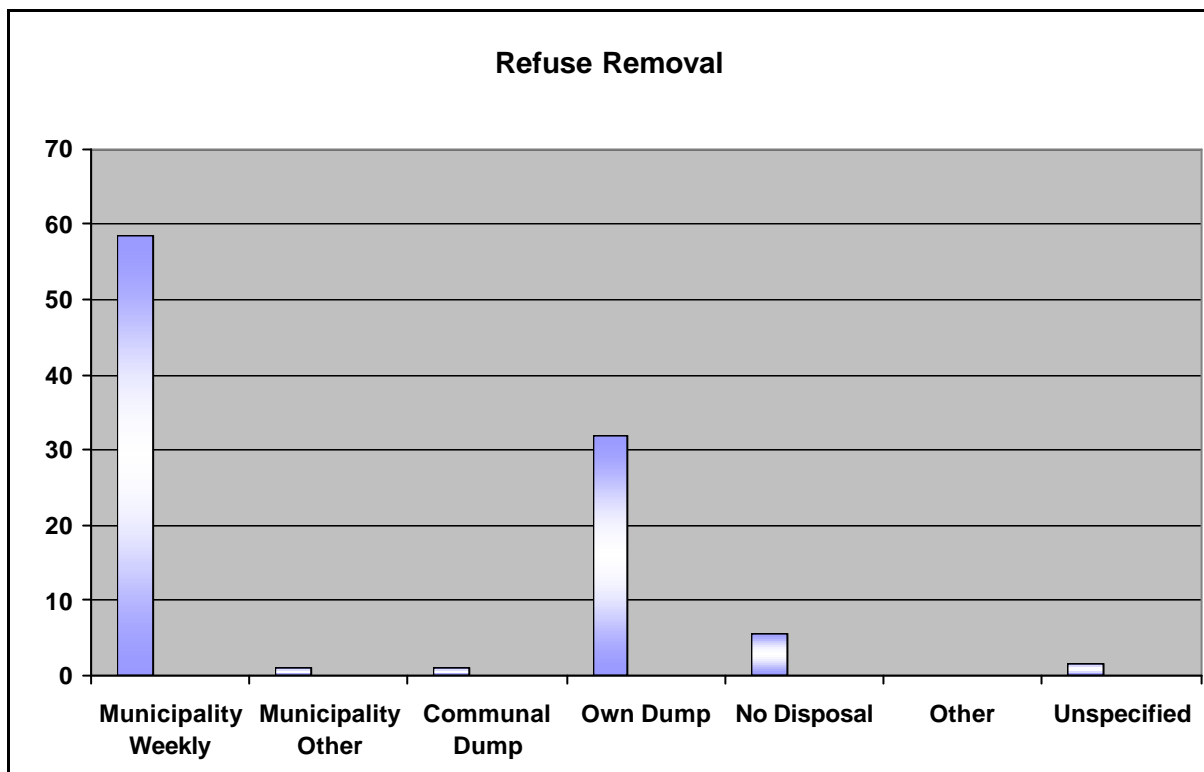
☞☞ Tolling of the John Ross Highway: this will be done in terms of a tender process dealing with the design, construction, finance, operation and maintenance of this road as a toll highway concession contract.

☞☞ A city delegation of personnel and councilors has met with representatives of the Department of Transport's regional and provincial offices regarding the maintenance of provincial roads within the city boundaries.

☞☞ A traffic calming policy has been formulated for the City of uMhlatuze area, to ensure that traffic calming is addressed in a holistic manner.

3.5 SOLID WASTE

3.5.1 STANDARDS



Demarcation Board, 2001

The graph above indicates that approximately 58% of the people in the City of uMhlathuze have weekly refuse removal by the municipality. It could be said that this reflects the urban population, which constitutes approximately 50% of the population of the area. It therefore appears that the people in rural areas do not have access to refuse removal, with dire environmental consequences. Please refer to the **Landfill Sites and Cemeteries Plan** (overleaf).

There is a landfill site close to Empangeni Rail. This site (located on State Land), licensed by the Department of Water Affairs, is currently reaching maximum capacity. The Richards Bay landfill site is situated close to Alton near the old sewage works and is exceeding capacity.

3.5.2 SOLID WASTE COLLECTION

The urban areas in the City of uMhlathuze have a regular refuse collection system operated by the local authority. The solid waste disposal sites in Empangeni and Richards Bay are however reaching capacity and a regional landfill site near Empangeni is being investigated.

3.5.3 PROJECTS RECENTLY COMPLETED/CURRENTLY UNDERWAY

The uThungulu District Council is responsible for regional waste disposal sites. A regional site for the City of uMhlathuze was identified adjacent to the Empangeni landfill site. The site will be operated as a public/private partnership with the District Municipality.

3.5.4 RESOURCE OPPORTUNITIES AND CONSTRAINTS

3.5.4.1 Pressures

- ✍️ Poorly managed waste impacts negatively on human beings and the ecosystems with which they interact. The potential impacts include:
 - ✍️ Contaminated soil;
 - ✍️ Surface and ground water pollution;
 - ✍️ Objectionable emissions such as odours;
 - ✍️ Hazardous gaseous emissions such as methane and carbon dioxide;
 - ✍️ Unsightly litter and windscatter;
 - ✍️ Illegal dumping (fly-tipping); and
 - ✍️ Stormwater drain blockages

- ✍️ There is a need for integrated management systems and facilities for medical waste disposal; the current lack of these facilities poses health risks.

- ✍️ Limited surface water and groundwater resources may already be impacted by poor waste practices

- ✍️ Concerted efforts are needed to increase people's awareness of good waste management practices (Strategic Environmental Assessment, 2002).

3.5.4.2 Responses

✍️ A regional hazardous waste disposal site

The existing waste disposal facilities in uMhlatuze Municipal area do not meet the industrial waste disposal needs of these areas. A regional facility is therefore urgently required to facilitate industrial development in the area. The regional general and hazardous waste requirement may be reduced if the metallurgical sector, in particular, can be encouraged to implement a programme of waste minimisation, re-use and material recovery in line with the National Waste Management Strategy (DEAT, 1999). At the current growth rate of 5.6% a G:L:B⁺ facility would be an absolute requirement to accommodate the 538 927 tons of general waste per year predicted to be generated in the uMhlatuze Municipal area Region by the year 2018. Consideration must be given to permitting this disposal site as an H:h facility in order to service the hazardous waste currently being transported out of the area. Such a site should have the capacity to accommodate a total waste stream of 583 530 tons by the year 2018.

Lombard & Associates conducted a study to identify "windows of opportunity" with suitable environmental conditions containing candidate waste disposal sites within the uMhlatuze Municipal area (Lombard & Associates, 1998). Only one significant "window area" north of the Heatonville Rail Siding was identified as being suitable relative to the need for waste disposal facilities which would accommodate industrial development in the region. However, this is currently located on privately owned farmland. The groundwater database and other data used in this study were 5 years out of date and field verification and basic reconnaissance is needed to check the validity of this study. Although a site here is more costly in terms of distance for transport of general wastes, the tonnage of hazardous industrial wastes disposed at such a facility would be sufficient to cross-subsidise the additional cost of haulage and disposal of domestic wastes at such a site.

☞☞ The advantages and disadvantages of having regional waste disposal facilities

The advantages of the uMhlathuze Municipality having regional hazardous waste disposal facilities, i.e. H:H, H:h and Biohazardous incinerators include:

- ☞☞ Disposal closer to the generation point;
- ☞☞ Less risk associated with the transport of the hazardous substance over long distances, particularly by road haulage;
- ☞☞ Opportunities for integrating hazardous waste treatment and disposal facilities;
- ☞☞ Less stockpiling of hazardous waste;
- ☞☞ More accessible facilities at lower disposal cost per ton;
- ☞☞ Less illegal dumping;
- ☞☞ Better coordination and control of the disposal of medical wastes;
- ☞☞ Possibilities of waste-by-rail options and road transport options; and
- ☞☞ Opportunities for partnerships with the private sector.

The disadvantages of having regional hazardous waste disposal facilities include:

- ☞☞ High establishment cost of facilities;
- ☞☞ Public opposition once alternative sites have been identified;
- ☞☞ Opposition to incineration of medical waste;
- ☞☞ Economic feasibility would have to be determined; and
- ☞☞ H:H and H:h landfills represent an end-of-pipe solution.

☞☞ Potential geographical location of sites

The identification process for potentially suitable sites for Hazardous Waste Landfill Development is based on the site selection criteria set out in DWAF, Second Edition, 1998, Waste Management Series, Minimum Requirements for Waste Disposal by Landfill. "Windows of opportunity" were identified through a process of "negative mapping" whereby ArcInfo spatial data was used to eliminate areas considered unsuitable in terms of the criteria listed below:

- ☞☞ Land use;
- ☞☞ Planning;
- ☞☞ Geology; and
- ☞☞ Geohydrology.

The available waste data for the sub-region diagram suggests that hazardous waste constitutes a small fraction of the total waste generated. The final selection of a candidate hazardous waste site should be carried out in conjunction with a number of socio-economic factors, which include:

- ☞☞ Sources and volumes of hazardous waste;
- ☞☞ Transport model and cost benefit analysis to determine if one or more H: sites should be developed in the region;
- ☞☞ Available transport infrastructure (rail offering the preferred transport alternative in terms of cost and safety);
- ☞☞ Land ownership, use and future planning initiatives etc.

On the basis of this preliminary study, available rail infrastructure and local knowledge, the following area emerged as a preferred window of opportunity in the sub-region:

- ☞☞ North-eastern Region - Heatonville Area.

Alternative solutions

Taking the information into account the following possible alternatives could be considered:

Upgrade existing facilities

For this option to be viable new generation landfill sites in the sub-region would have to be identified and investigated for the purpose of amending their permits in accordance with the DWAF 'Minimum Requirements' with reference to the National Waste Management Strategy and the Draft KwaZulu-Natal Waste Policy. This would in most circumstances lead to the upgrading of the liner systems at great cost to the site operator. However depending on the in-place volumes it might be possible to establish H:h or even H:H cells within a new G:L:B⁺ landfill sites.

Establish new site/s

The establishment of a new facility would be subject to rigorous controls to reduce risks and minimise the potential impacts associated with the disposal of the waste: an Environmental Impact Assessment, for example, would dictate the landfill liner systems required. Specialist studies would include geohydrological investigations and a Social Impact Assessment which would allow the authorities to make informed decisions with regard to the permitting of new facilities.

Maintain the status quo

In the instance that the status quo remains, the H:H and H:h waste in the region will continue to be transported to other provinces and the Durban Metro Area respectively for waste disposal purposes. This, however, is not considered a solution, as the region would remain dependent on other provinces and areas within KwaZulu-Natal.

Life cycle analysis

Sustainable waste management should consider all aspects of the life cycle:

- Generation,**
- Storage,**
- Transportation,**
- Processing/recycling, and**
- Disposal.**

Hierarchy of waste management

Industries should be encouraged to adopt the following hierarchy of waste management:

- Avoid waste;**
- Re-use materials;**
- Reduce waste;**
- Recycle wherever possible;**
- Dispose of residue in an environmentally acceptable way.**

Processing plants or clean industry

The municipality should be aware of the importance of specifying that future industry that establishes in the region should be environmentally "clean" industry and should not

exacerbate the environmental pollution that already exists. Processing the existing waste streams will address the existing environmental loads contributed by industry. This is a matter of local authority by-laws relating to the National Waste Management Strategy and the Draft KwaZulu-Natal Provincial Policy on Waste Management.

Need for H:h landfill

The municipality needs an H:h landfill site in order to cope with current amounts of hazardous waste. Hazardous waste from industries is currently transported to Durban and Gauteng. A more detailed study is needed. This study should concentrate on alternative waste treatment and disposal technologies.

Marine pipelines

The marine pipelines only have spare capacity for effluents from small and medium sized industries. Mhlathuze Water should not rely on this method especially as there is no prior treatment of effluents. The two pipelines for liquid waste at Richards Bay need to be carefully managed, with due consideration for the potential marine impact of new industries' effluents before acceptance of that effluent for disposal to sea. Considerations such as recycling and on-land treatment, or pre-treatment before discharge could be required, depending on the nature of the effluent. Acceptance of an effluent for disposal to sea is not taken lightly by the management team at Mhlathuze Water, who are the operators of the pipeline.

Policy Initiatives

The White Paper on Integrated Pollution and Waste Management for South Africa 2000 sets out a national framework including an emphasis on prevention and waste minimization and the use of ambient environmental quality standards. The functions of local government include a proactive role for waste management planning and implementation within their areas.

The Environmental Conservation Act (Act 73 of 1989) controls the establishment and operation of waste disposal sites and littering.

The Natal Prevention of Environmental Pollution Ordinance 21 of 1981 creates a general offence of littering or polluting.

The KwaZulu-Natal Draft Policy in Waste Management (1997) contains a wide range of strategic goals relating to all aspects of waste management but does not define the role of local government.

Key issues for sustainable environmental management

The waste disposal sites within the municipal area all have the potential to pollute ground and surface water through an increase in electrical conductivity as result of anions and cations leached from the waste.

The Zululand Coastal Aquifer is a strategic fresh water resource that requires protection. In a letter written by Geomeasure Services (Pty) Ltd expressing the views of the Groundwater Association of KwaZulu-Natal and the Borehole Water Association of South Africa, these organisations believe that this important resource has already experienced some environmental damage due to poor waste management practices and requires rigorous protection to preserve its utility for the future. Solid waste disposal sites and tailing dams should not be located over, or

adjacent to the aquifer, where there is a potential risk of polluting the resource. This should also be taken into account when siting any new landfill sites.

- ✍ The existing Empangeni landfill site can only accommodate general (G) waste. There is inadequate disposal capacity for the industrial waste (both low and high hazard) disposal needs in the broader uMhlathuze Municipal area.
- ✍ There is very limited capacity in the uMhlathuze Municipal area, and in fact in the entire province, for the disposal of health care wastes in an environmentally appropriate
- ✍ The current management of hazardous waste in the area with regards to stockpiling, transporting waste long distances to other areas and even provinces, is not sustainable.
- ✍ The issue of waste minimization is not being adequately addressed and needs coordination and concerted effort to be effective in the longer term.

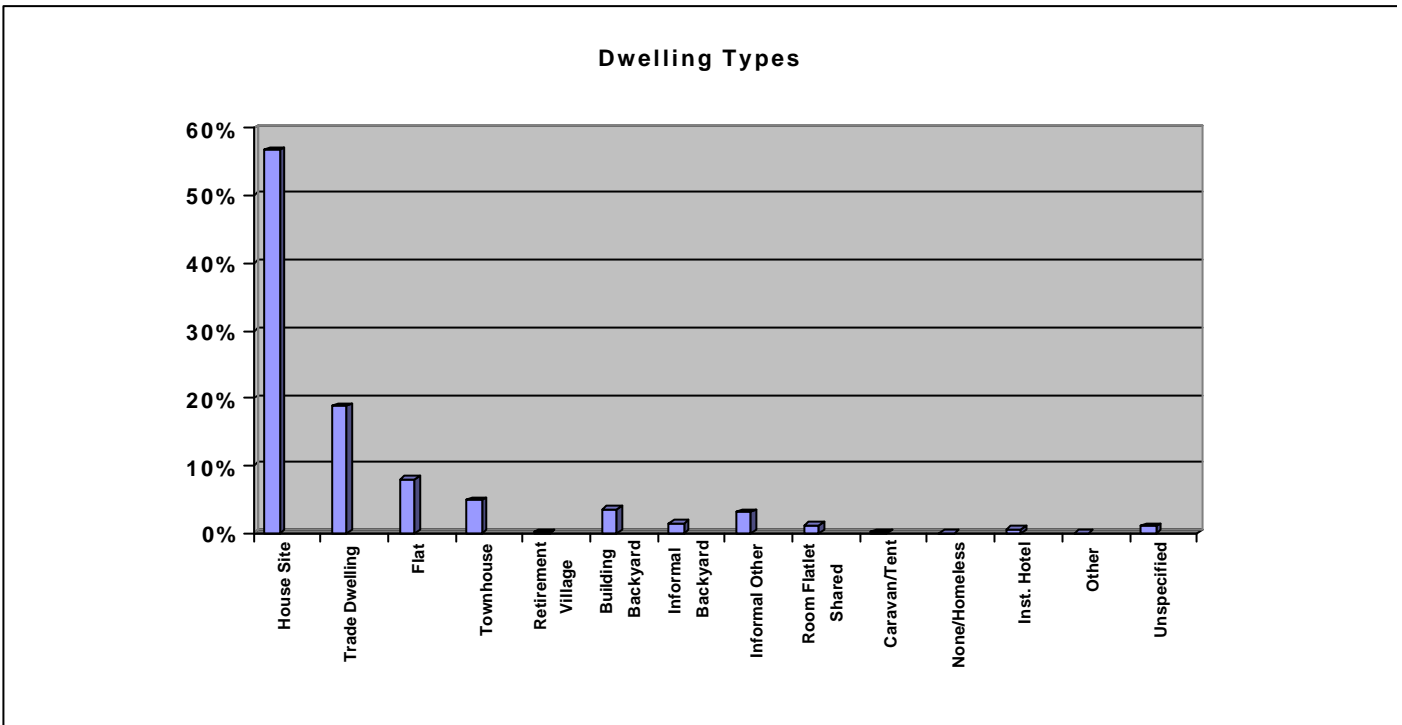
✍ Information gaps

- ✍ A waste database for the broader area i.e. the City of uMhlathuze area and the district council area is needed since the information currently available is limited and imposes constraints on future planning.
- ✍ Relative to the waste database that has been prepared by Lombard & Associates and the potential future industrial waste disposal requirements for the region, hazardous waste disposal capacity must be planned for the region. Such capacity must be planned despite the caveats concerning clean technology and waste minimisation in the Draft Waste Management Policy for the Province of KwaZulu-Natal and the National Waste Management Strategy, Version C (DEAT, 1999). The quantities of hazardous waste currently being generated by industry for disposal on third party sites are currently large enough to justify the establishment of a Class H:h waste disposal facility in the region.
- ✍ There are no accurate figures on stockpiled hazardous wastes in the broader area.
- ✍ Lack of verification of information by KZN Health on medical waste which must include that handled by private and public sector hospitals, clinics and also veterinary clinics.
- ✍ There is no readily available information on the destruction of veterinary waste that form part of the medical waste stream in the definitions set by "The Minimum Requirements for the Management of Waste, Second Edition, 1998".
- ✍ There is still much information required e.g. local ground water quality and usage and air dispersion patterns in the area where a potential hazardous waste facility may be located.
- ✍ The uMhlathuze Municipality together with the district council needs to develop an integrated waste management plan for the area. This plan must put in place the hierarchical management of waste from minimization strategies, re-use, and recycling and appropriate disposal technologies (Strategic Environmental Assessment, 2002).

3.6 HOUSING

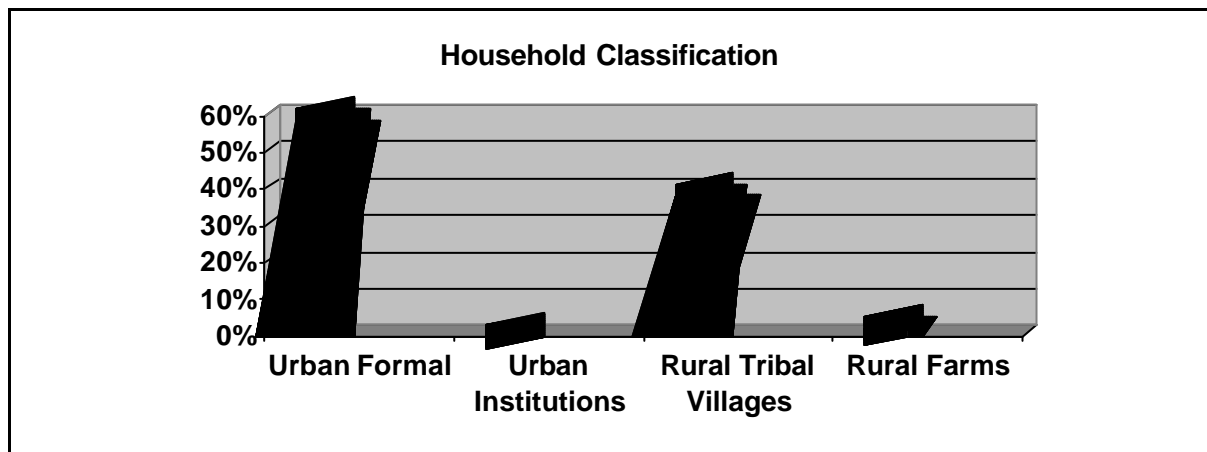
3.6.1 STANDARDS

In terms of the Constitution of South Africa, 1996 everyone has the right to access adequate housing. To address the housing backlog, several housing programmes have been instituted at provincial level. Different standards would be applicable to urban and rural areas in terms of housing type and density, although safety standards are applicable to all types of built structures.



Demarcation Board, 2001

Approximately 56% of the people in the City of uMhlatuze reside in single residential houses. In total, approximately 88% of the people in this area reside in their own formal housing structure, while approximately 5% reside in backyard structures and 3% stay in informal structures. Only 0.04% of the people in the City of uMhlatuze are considered to be homeless.



Demarcation Board, 2001

According to the Demarcation Board, approximately 60% of the people in the City of uMhlatuze reside in the urban area, while approximately 40% of the people reside in the rural area. Although agriculture is an important economic sector, only 2,5% of the population people stay on farms in rural areas. This could mean that farm workers reside in the urban areas and commute to farms on a daily basis, or that seasonal workers are used.

There is no housing backlog in the formal Empangeni area. There is a backlog of 938 units for indigent applicants or starter homes in Richards Bay, but these are provided for in current planning initiatives. This is based on a needs determination conducted in 1999, which indicated that the most categorical needs for housing are encountered in the fringe areas around existing townships. The level of need is three times as high as it is in the townships and core areas of Richards Bay. There is however a great deal of interest in alternative housing and a high level of housing aspiration. Envisaged housing expenditure and affordability levels are low, particularly in relation to the envisaged product and level of services. The housing need was estimated at 1 934 units, at the time of the survey (1999) and at 938 units in 2001.

There is no information available about housing backlogs or a demand for housing in the rural area. There is however a high concentration of people in the Madlebe Tribal Area and the Khoza Tribal area, with more than 600 people per km² and in some instances even more than 800 people per km² (Imfolozi Sub-regional Development Plan, 1999). While most of the rural areas have top structures, the population density and distance from basic services necessitate upgrading and formalisation of these areas, as part of a phased approach.

A recent marketing exercise conducted as part of the Mhlatuze low cost housing project between Empangeni and Ngwelezane yielded 2 000 applicants who expressed interest in purchasing houses. This is indicative of a high demand for housing, even though there is no backlog in the area.

There is currently no housing waiting list available for the City of uMhlatuze area. The former Richards Bay Local Council formulated a housing policy, which is still applied in the Richards Bay area. In terms of this policy, three (3) categories of housing beneficiaries were identified, namely:

- a) Non-qualifiers (in terms of criteria determined at national and provincial level);
- b) Non-qualifiers (people qualifying otherwise but earning more than R3 500/household/month);
- c) Subsidised group (people qualifying for subsidies in terms of criteria and household income).

In terms of the policy, preference is given to local people in the sale of affordable housing and housing schemes.

3.6.2 PROJECTS RECENTLY COMPLETED AND CURRENTLY UNDERWAY

3.6.2.1 Aquadene

A low cost housing project is planned on land (Erf15601) north of Aquadene. The City of uMhlatuze invited proposals from suitably qualified and experienced social housing developers in August 2001 and will co-ordinate, manage and facilitate the project. The project consists of approximately 500 serviced stands with a ranging erf size of 250 m².

3.6.2.2 Brackenham

There are currently two (2) initiatives underway in Brackenham, namely:

- ✍️ Approximately 125 fully serviced erven are currently vacant and available for development. These erven are advertised to the general public, although preference will be given to purchasers from the City of uMhlatuze area. Brackenham is considered to fall within category B of the above-mentioned housing policy, with a joint household income of between R2 560 and R6 000 per month.
- ✍️ The transfer of approximately 600 rental units (stands and houses) to full title. This is a project done in conjunction with the Provincial Department of Housing. To facilitate the process, all the files relating to this have been handed over to the municipality, to deal with the administrative aspects of the process. Approximately 300 erven have already been transferred to beneficiaries.

3.6.2.3 Opening of Township Registers

The Ingonyama Trust Board took ownership of land vested in the former Government of KwaZulu Natal prior to 1994, in terms of the Ingonyama Trust Act, 3KZ of 1994. In terms of this Act, land situated in a township, shall vest in the local authority having jurisdiction over such township. The Ingonyama Trust is in the process of formalising these transfers to local authorities. Grant funding was made available by the National Department of Land Affairs, to assist local authorities with the cost involved in effecting these transfers, involving the approval of General Plans and Opening of Township Registers.

The uMhlatuze Municipality has initiated this process by asking for proposals for consultants to undertake the approval of General Plans and Opening of Township Registers on their behalf in October 2001. It is expected for this process to be finalised by mid 2002. Once the Township Registers have been opened, it would be possible to transfer stands to the existing occupants and thereby upgrade leasehold to freehold. All the former black townships in the City of uMhlatuze area will benefit from this, namely Ngwelezane, Esikhawini, Vulindlela and Nseleni.

3.6.2.4 uMhlatuze Housing Project

The project, situated between Empangeni and Ngwelezane is currently in the implementation phase. The development will work towards the physical integration of Empangeni and Ngwelezane and will deliver 5 000 residential units together with supportive services and community facilities. CMIP funding was obtained to provide bulk services for this project. The construction of houses commenced in 2001 and construction of the infrastructure services is also well underway.

3.6.2.5 Upgrading of Hostels in Esikhawini

A request was prepared and submitted to the Provincial Housing Department to obtain funding for the upgrading of hostels in Esikhawini. There are seven hostels situated in different locations across this township. These hostels are currently occupied with a total of 360 units in the hostels, amounting to an official occupation figure of 1 440 persons residing in the hostels. There is however overcrowding occurring, implying that this figure is an under-estimate of the actual amount of people residing there. Rental of approximately R9 per person per month is charged, but no credit control measures are applied, due to the overcrowding and logistical problems associated with this situation.

A budget of R11,920 million had already been allocated towards this purpose. All of the hostels were earmarked for upgrading as a family hostel. A pre-condition to the approval of provincial grant funding is that alternative accommodation should be provided to inhabitants, while the upgrading is underway. Due to the fact that this had not been possible up to now, the upgrading could not commence. Allocation criteria have to date not been determined, although consultative structures are in place to ensure community involvement in the process.

3.6.2.6 Mzingazi Village

The establishment and development of this township was undertaken by the former Richards Bay Local Council, as an agri-village. The erf sizes are approximately 1 000m² in extent, to provide for gardening on the erven. Erven were allocated to 565 approved beneficiaries. The township is serviced at a rudimentary service level with water and pre-paid electricity, although no sanitation is available. The problem with this township is that Provincial Housing Board funds cannot be allocated to the project, due to the fact that the ranging erf size exceeds the prescribed criteria. Official transfer of erven therefore cannot take place, which has resulted in illegal selling of erven and doubling up. This also implies that no funding is available for the upgrading of services and provision of top structures.

3.6.2.7 Informal Settlements

Informal settlements have occurred around existing townships and in some of the rural areas. Initiatives have been noted by the municipality for the upgrading of informal settlements at Dube, Gobandlovu and Mandlankala, although no formal projects have been identified as yet.