1. STUDY INTRODUCTION

1.1 BACKGROUND TO PROJECT

In 1998, the Department of Water Affairs and Forestry (DWAF) completed an assessment of various options to improve the management of water available for social and economic development in the Groot Letaba catchment (**Figure 1.1**).

Since it was recognised that the water resources of the Groot Letaba River were already heavily committed, a wide range of strategic alternatives were considered to improve the water availability situation in the face of growing needs in the domestic water use sector, deterioration in the conservation status of the river ecology and increasing shortages in the irrigation sector. Consideration was given to the following options at a feasibility level of detail and reliability:

- Replacing commercial afforestation with natural vegetation.
- Ceasing the export of water to the Sand River catchment.
- Improving the utilization efficiency of water used for irrigation.
- Decreasing the water allocated for irrigation use.
- Water loss management in the reticulation systems for domestic and industrial water users.
- Creation of additional storage in the river system to further regulate the river flow.
- Improved water management in all user sectors.

The feasibility study indicated that additional storage facilities would provide for a more sustainable solution to the water resource problems. To this end, various alternative storage sites were examined, namely a site at Hobson's Choice, in the Letsitele River, sites in the Groot Letaba River of which only that at Nwamitwa was found to be reasonable (but not good), and the raising of the Tzaneen Dam.



The outcome of these earlier investigations led to the recommendations that construction of a new major dam at Nwamitwa be considered together with improved water management interventions. The raising of the Tzaneen Dam, with the objective of minimising the intensity and consequences of shortages in the irrigation sector, was found to deserve sympathetic consideration. DWAF is now reviewing and updating the needs of this area and post-feasibility bridging studies are being conducted to confirm whether the recommendations made previously are still relevant and how they should be taken forward.

The post-feasibility bridging studies options to be investigated include the construction of a large dam on the Groot Letaba River at the Nwamitwa site, downstream of the confluence of the Nwanedzi River, realignment of the roads to accommodate the dam, construction of water treatment works, bulk water pipelines and pump stations from the dam site to communities in the area and the raising of the Tzaneen Dam wall.

Environmental authorisation in terms of Section 24 (5) of the National Environmental Management Act (NEMA), Act No 107 of 1998 and other legislation is required before the infrastructure components of the project can be implemented. An Environmental Impact Assessment (EIA) process commenced in June 2007 and is expected to be completed in the last quarter of 2008. This document forms part of the EIA series and is the Draft Scoping Report.

1.2 OBJECTIVE OF THE STUDY

An EIA is a planning and decision making tool used to identify potential negative and positive impacts of a proposed project and to recommend ways to enhance the positive impacts and minimise the negative ones. The EIA will address the impacts associated with the project, and provide an assessment of the project in terms of the biophysical, social and economic environments to assist both the environmental authorities (in this case the national Department of Environmental Affairs and Tourism (DEAT)) and the proponent (i.e. the DWAF) in making decisions regarding implementation of the proposed project. The work will be undertaken in compliance with the National Environmental Management Act (No 107 of 1998) (NEMA), specifically Regulations in GN No 385, 386 and 387 of 21 April 2006.

The EIA process will consist of three phases:

- The Scoping Phase;
- The Impact Assessment Phase; and
- The Decision-Making Phase.

1.3 PURPOSE OF THIS REPORT

The main purpose of the Scoping Phase of the project is to identify and define the issues that need to be addressed in the Impact Assessment Phase. Input from the technical team, the authorities, specialists and Interested and Affected Parties (I&APs) is considered and integrated.

The purpose of the Scoping Report is to document the outcome of the Scoping Phase of the project. This draft report will be made available to I&APs for comment, prior to finalisation and submission to the authorities, to afford them the opportunity to ensure that their comments and input has been captured accurately and correctly understood.

1.4 ENVIRONMENTAL IMPACT ASSESSMENT TEAM

ILISO Consulting has been appointed as Independent Environmental Assessment Practitioner (EAP) to undertake the EIA. Dr Martin van Veelen is the Project Leader. This Draft Scoping Report was compiled by Terry Baker with input from a team of specialists. (**Table 1.1**)

Dr Martin van Veelen is a professional engineer with a PhD in aquatic health. He is the Managing Director of the ILISO Environmental Management Division and a certified Environmental Assessment Practitioner with 28 years experience. He specialises in project management, environmental impact assessments and water resource planning. He specifically has extensive experience in water quality, especially water quality management, water quality monitoring and water quality assessment. Martin has experience in managing projects that involve multidisciplinary teams, and projects that involve public consultation and participation.

Terry Baker is a certified Environmental Assessment Practitioner (EAP), has a MA in Environmental Management and specialises in Environmental Impact Assessments and Project Management. She has been involved in a variety EIAs including for transmission lines, water supply projects, dams, roads and airports, in

South Africa, Botswana, Uganda, Lesotho, and Mozambique. She has been involved in public participation programmes, water quality assessments, socioeconomic and institutional development projects and the use of Geographic Information Systems on a number of projects. Terry is actively involved in the International Association for Impact Assessment, and serves on the National Executive Committee of the South African Affiliate.

PERSON	COMPANY	ROLE ON THE TEAM
MARTIN VAN VEELEN	ILISO CONSULTING	PROJECT LEADER
TERRY BAKER	ILISO CONSULTING	ENVIRONMENTAL ASSESSMENT PRACTITIONER
DEON ESTERHUIZEN	ILISO CONSULTING	ENVIRONMENTAL MANAGEMENT PLANS
KAREN JODAS	SAVANNAH ENVIRONMENTAL	BORROW AREA
SEAN O BEIRNE	SES	PEER REVIEW
BERT DE VRIES	ILISO CONSULTING	TRAFFIC
ANITA BRON	MASTERO RESEARCH	SOCIAL
ANDREW DICKSON	MARGOT SANER AND ASSOCIATES	HEALTH
NANJA CHURR	KAYAMANDI	REGIONAL ECONOMICS AND LANDUSE
VERONICA RALL	GOLDER AFRICA	AQUATIC ECOLOGY
JOHNNY VAN SCHALKWYK	NATIONAL CULTURAL HISTORY MUSEUM	HERITAGE RESOURCES
DEREK COSIJN	JONGENS KEET ASSOCIATES	NOISE
RENE THOMAS	AIRSHED	AIR QUALITY
KAREN JAMES	INSITE	VISUAL IMPACTS

Table 1.1: EIA Project Team

1.5 THE STRUCTURE OF THIS REPORT

The following information, in accordance with Regulation 29 of Government Notice 385, is included in this report:

Groot Letaba River Water Development Project (GLeWaP)

Environmental Impact Assessment

- background information, scope of the study and details and expertise of the EAP who compiled the scoping report (Chapter 1);
- the motivation for the proposed project (**Chapter 2**);
- a description of the proposed project (Chapter 3)
- an investigation of alternatives (Chapter 4);
- a description of the receiving environment (Chapter 5);
- legislation and guidelines that have been considered in the preparation of the scoping report (**Chapter 6**);
- public participation in the scoping phase.; (Chapter 7);
- key issues identified (Chapter 8);
- a plan of study for the Environmental Impact Assessment (Chapter 9);
- conclusions (Chapter 10); and
- references used in the study (Chapter 11).

2. MOTIVATION FOR THE PROJECT

The Groot Letaba Valley falls within the Luvuvhu-Letaba Water Management Area (WMA), one of the 19 WMAs into which South Africa is divided. Human settlement, agricultural production and tourism between the Drakensberg escarpment and the Kruger National Park have placed demands on the water resources of the Groot Letaba River which can no longer be met within reasonable risks of shortages from the existing infrastructure.

Faced with water shortages of increasing severity and frequency, the main consumptive users of water (irrigation, forestry, domestic and industrial) have from time to time had to compete for limited supplies by taking extraordinary measures to survive. This has resulted in serious degradation of the riverine ecosystems. Historically the environment was not considered a water user and was not allocated any water from available resources. However, in the Letaba River catchment 14.8 million m³/annum was allocated, on an ad hoc basis, for release from Tzaneen Dam to the Kruger National Park but, as a result of evaporation and river abstractions, little if any of these releases reached the Park with real beneficial effect.

With the advent of the National Water Act (Act 36 of 1998 NWA), a water allocation or Reserve for basic human needs and for sustaining ecological functioning, has placed a new perspective on water resource management in the Groot Letaba River. The emphasis in the past has been on the augmentation of supplies to mitigate shortages in the Groot Letaba River. This approach must be complemented by a strategy for managing the water resources in a sustainable manner. Proposals for augmenting reliable water supplies from the Groot Letaba River include the construction of a dam on the Groot Letaba River at Nwamitwa just downstream of the Nwanedzi River as well as the possibility of the raising of Tzaneen Dam. Bulk infrastructure for the treatment, conveyance and storage of potable water for primary use forms an integral part of the development proposals. Attention is focused on water needs for the increasing human population, for downstream riverine ecosystems (including those in the Kruger National Park) as well as for stabilising commercial irrigation, including the settlement of resource-poor farmers (**Figure 2.1**).

Groot Letaba River Water Development Project (GLeWaP)

Environmental Impact Assessment



Estimated in 1998 Feasibility Study

Figure 2.1: Water Utilization and Requirements

The catchment area of the proposed Nwamitwa Dam is 1 400 km² and the Mean Annual Runoff (MAR) is approximately 122,6 million m³ under natural undeveloped conditions. For a dam with a storage capacity of 143,8 million m³ the estimated increase in system yield is 47 million m³/a after providing for the instream flow requirements as was estimated at the time.

The agricultural sector (fruit orchards dependant on irrigation) and the associated agro-industries provide the majority of employment opportunities in the area. Competition for the limited jobs is fierce and unemployment in the area is high and many people rely on income from family members working in the cities. Many communities do not have reasonable access to safe reliable water supplies and the ecosystems which rely on flow in the river system are subject to increasing stress and degradation. Further socio-economic development, in which tourism is expected to play an important role, is hampered by the limited availability of adequate water supplies.

The Groot Letaba River Water Development Project (GLWAP) is a major initiative by the Department of Water Affairs and Forestry in support of the Limpopo Provincial Government's development strategy for the province. The project will have a positive impact on the regional economics and on alleviating poverty. This will mainly be achieved through:

- Increasing the safe, reliable water supplies for domestic and industrial use;
- Minimizing the frequency, intensity and duration of restriction on the use of water allocated for irrigation of high value crops;
- An increase in total household income through stabilising the job market; and
- Providing leverage for the equitable distribution of resources.

The proposed infrastructure will make it possible to improve the management of water resources so as to stop degradation of the conservation status of the riverine ecosystem.

The GLEWAP includes a number of infrastructure components, as well as a range of other initiatives as described in **Chapter 3**.

3. DESCRIPTION OF THE PROJECT

The Groot Letaba River Water Resources Development Project is aimed at improving the management of the water resources in the catchment as a whole. It consists of non-infrastructure options to make more water available as well as the construction of infrastructure components. Although only the construction of the infrastructure components require authorisation from the DEAT and are subject to this EIA, they cannot be fully understood or evaluated in isolation from the non-infrastructure components.

The infrastructure components of the project include:

- Construction of Nwamitwa dam on the Groot Letaba River, downstream of the confluence of the Nwanedzi River. The dam wall could be up to 36 m high and have a gross storage capacity of up to 144 million m³.
- The R529, D1292 and the P43/3 will have to be re-aligned to accommodate the dam.
- Raising of the Tzaneen dam could result in increasing the storage from 157.5 million m³ up to approximately 203 million m³.
- Construction of water treatment works, and construction of bulk water pipelines and pump stations from the dam for water supply for domestic to communities in the area. Pump stations and reservoirs could each occupy an area of about half a football field.
- Construction activities will take approximately 5 years with several construction teams working concurrently in different areas at the proposed dam site and along the pipeline routes.
- Residential accommodation for construction staff will be established in the vicinity of the proposed dam or in established towns. Housing, internal roads, water and electricity supply, water treatment, solid waste disposal, emergency facilities and recreational amenities will be provided.
- The construction cost of the infrastructure components of the project is estimated in excess of R1500 million.
- Construction sites will include offices, internal roads, water and electricity supply, waste water treatment, solid waste disposal, emergency facilities, areas for the handling of hazardous substances, workshops, washbays, areas for the safe storage or explosives and communication infrastructure.

Supply of water from new dam at the site known as Nwamitwa targeted by 2012 with full yield around 2013. Construction will start in 2009.

3.1 NON-INFRASTRUCTURE OPTIONS TO MAKE MORE WATER AVAILABLE

The DWAF is pursuing the following non-infrastructure options, which do not form part of the project for environmental authorisation, to make more water available:

- Water conservation and demand management, as well as water recycling and re-use. The aim is to ensure that increased efficiency and effectiveness of water use will help address some of the short- and long-term water requirements of the area.
- Local groundwater resources

During the feasibility studies in the 1990s and from recent investigations, it was found that although groundwater cannot be considered as the only source of water to satisfy increasing needs, it can be used to good effect for small-scale domestic water supplies and food plot irrigation. In this area with limited water resources, the conjunctive use of ground and surface water should be promoted. Groundwater resources should be developed incrementally to increase yields, but with ongoing monitoring to ensure good water quality. The Department will make recommendations to local authorities in this regard.

• Removal of invasive alien vegetation

DWAF's Working for Water Programme is actively removing invasive alien vegetation in the Groot Letaba Valley as a means of improving the yield in the river system.

3.2 INFRASTRUCTURE COMPONENTS OF THE PROJECT

As agreed with DEAT, this project is being implemented in an iterative manner. The details of the design of the infrastructure components (e.g. height of dam wall and pipeline routes) were not available for the Scoping Phase. These details will be finalised in time for the specialist studies and impact assessment phase. The Scoping Phase of the project was therefore based on a "highest impact scenario" by

considering, for example, the largest possible dam that would be considered, and an area within which the pipelines will be located.

3.2.1 Dam at Nwamitwa Site

The main component of the proposed GLeWaP project comprises a new major storage dam at a site in the Groot Letaba, referred to as the Nwamitwa site, downstream of the confluence of the Nwanedzi River (**Figure 3.1**). The size of the dam has not been finalised yet. The maximum possible dam size (i.e. 36 m high) was used for Scoping purposes. The dam comprises of a concrete structure in the river section accommodating a spillway and outlet works, with earth embankments on both flanks. With a storage capacity of 144 million m³ it would increase the system yield by about 47 million m³ per year. (By comparison, the capacity of Tzaneen Dam is 157,5 million m³).

The final size of the dam will be determined in a series of technical and financial investigations, informed by the findings of the EIA. The relative socio-economic impacts of different dam sizes, including number of households to be relocated and effects on the citrus industry are receiving particular attention. The possible dam sizes that are currently being investigated are indicated in (**Figure 3.2**). The dam will be designed to enable the requirements of the Reserve in the Groot Letaba River, particularly in the river reach downstream of the dam, to be provided.

Local road alignments

The R529, D1292 and the P43/3 will have to be re-aligned to accommodate the dam. Proposed re-alignments are indicated on (**Figure 3.3**). Local alignments will be determined in consultation with landowners and the provincial road authorities and will take cognisance of the impacts investigated during the EIA







Raising of the Tzaneen Dam wall

It was also proposed to increase the capacity of Tzaneen Dam to approximately 203 million m³ by raising the dam wall. This could increase the firm yield of the dam by about 6% from 60 million m³/a to 64 million m³/a, but more importantly, the dam could then be operated so as to minimize the frequency and intensity of restrictions on water allocations for the irrigation of permanent fruit orchards.

The Tzaneen Dam, located on the Groot Letaba River close to the town of Tzaneen), mainly serves the irrigation demand along the Groot Letaba River valley, domestic and industrial water supply to Tzaneen, Nkowakowa, Letsitele, Consolidated Murchison Gold Mine, several other small industrial users, and a large number of rural villages.

3.2.2 Pipelines, Treatment works, Pump Stations and Reservoirs

Bulk water supply infrastructure including pipelines, a water treatment plant, various pump stations and reservoirs will be investigated. The area expected to be served is indicated in (**Figure 3.5**). Pipelines will be routed next to existing roads or pipelines as far as possible in order to minimise impacts. The exact routes of the pipelines will be used for the specialist studies and impact assessment phase of the project. The area expected to be served is generally fairly inform in terms of the natural and social environment, and this approach was therefore adequate for scoping purposes.





The various reservoirs will be located so that local authorities will be able to obtain water for reticulation to individual users. Existing bulk water supply infrastructure (**Figure 3.5**) will be incorporated into future development wherever it is feasible. The upgrading of one or more of the three existing water treatment works in the study area will be investigated as an alternative to constructing a new one.

Pump stations, reservoirs and treatment works will be fenced off with security fencing. Final sizing is still to be completed but pump stations and reservoirs could each occupy an area of approximately 0.5 ha (about half a football field).

Electricity requirements for the project will be assessed separately by Eskom, and will be subject to a separate EIA process, if required.

3.2.3 Construction

Construction activities will take approximately five (5) years, with several construction teams working concurrently in different areas at the proposed dam site and along the pipeline routes. Residential accommodation for construction staff will be established in the vicinity of the proposed dam or in established towns. Housing, internal roads, water and electricity supply, waste water treatment, solid waste disposal, emergency facilities and recreational amenities will be provided.

Construction sites will include offices, internal roads, water and electricity supply, waste water treatment, solid waste disposal, emergency facilities, areas for the handling of hazardous substances, workshops, washbays, areas for the safe storage of explosives, and communication infrastructure.

The sites will also include facilities for the bulk storage and dispensing of fuel for construction vehicles and working areas for stockpiling construction materials and concrete batching and bitumen plants.

3.2.4 Borrow pits

Location of the borrow areas for the sourcing of material for the dam and road construction works will be determined during the study and local landowners are

Groot Letaba River Water Development Project (GLeWaP)

Environmental Impact Assessment

invited to contribute information about the occurrence of material suitable for this purpose.

3.2.5 Scheduling

DWAF's target is to commence with the supply of water from the new dam by 2012, with full yield by around 2013, should environmental authorisation be obtained. For this to be achieved construction of some of the infrastructure must start in late 2009. The possibility of starting to abstract water from the dam during the filling period is also being considered.

3.3 INSTITUTIONAL ARRANGEMENTS

It is foreseen that the Department of Water Affairs and Forestry will be the owner of the water resource components of the project. This will be revisited as and when new institutions such as the proposed National Water Resource Infrastructure Agency and the Catchment Management Agency (CMA) have been established. After completion, a regional water supply entity would be considered for the management of the new bulk distribution infrastructure. Any potable water supply systems that will be served by the bulk distribution system will thus be the responsibility of the relevant municipalities.

A high-level Project Steering Committee has been established by the DWAF, and includes the Limpopo Provincial Government, the Mopani District Municipality, local municipalities, traditional authorities, sectors such as conservation, agriculture and industry to steer the post feasibility bridging studies.

3.4 COOPERATIVE GOVERNANCE

Investigating and implementing such a major infrastructure project to improve water management in the area is likely to give rise to many development opportunities, lead to change in socio-economic circumstances, cause changes in land use and have other beneficial effects.

Numerous other government authorities thus need to be consulted and participate to accommodate these proposed developments in their planning and future activities.

This includes the local authorities who will be required to include these proposals in their Integrated Development Plans (IDPs) in order to ensure access to potable water for the communities they serve.

Together with the Department of Water Affairs and Forestry, they will assist in ensuring that, in the longer term, all the projects and developments resulting from this initiative are sustainable, and that as many people as possible benefit from infrastructure development now being investigated.

3.5 CAPACITY FOR COMMUNITY WATER SUPPLY

Although this project will not be directly responsible for community water supply, it will make more water available for this purpose to local water service providers, such as municipalities. Provision will be made for off-takes from the bulk water distribution system or alternatively water will be delivered into reservoirs at agreed locations.

3.6 FUNDING OF THE GLEWAP

The construction cost of the infrastructure components of the project is estimated to be in excess of R1 500 million. Funding sources are likely to include a private sector component and a public sector component funded by Treasury.

4. ALTERNATIVES

4.1 Do Nothing

The NWA requires that the Reserve (basic human needs and ecological) receive the first right to available water. International obligations and strategic requirements must then be honoured. Water available after that can be allocated for beneficial use. The implication is that if no measures are taken to increase the ability to manage the water resources in the catchment, there will be shortages for irrigation and other developments and the socio-economic development in the region will be limited.

Plate 4-1 and **Plate 4-2** show some of the measures that communities living in the study area are already taking to acquire water for domestic purposes.



Plate 4-1: Women and children collecting water from the Groot Letaba River



Plate 4-2: Water vendor collecting water from the Groot Letaba River

People in some villages in the study area are dissatisfied with the quality of the groundwater that is available. The groundwater has a high salinity which is unpleasant to drink and use in cooking. The foaming of washing powder may also be affected. These people are therefore resorting to collecting their own water from local rivers. Water collected is not treated, introducing potential health risks. Collecting

water can also use up significant amounts of women and children's time, preventing them from attending to other activities like education, income generation and household chores.

Uncontrolled water collection from rivers also impacts on the natural environment. The riparian vegetation, geomorphology of the river and fauna in the river can be impacted on by water collecting activities. If communities feel an increased need for water, they may even start to build informal unauthorized structures to assist them to collect water. Such structures could have increased impacts on the natural functioning of the river.

The "no project" option, although the easy way out for the DWAF, is therefore not considered the best alternative as it does not allow for the desired ability to manage and operate the water resource system, and is likely to result in increased negative social, economic and ecological states in the Province.

4.2 REPLACING COMMERCIAL AFFORESTATION WITH NATURAL VEGETATION

The 1998 Feasibility Study investigated replacing commercial forestry areas with natural vegetation in order to reduce this streamflow reduction activity with the intention of resulting in increased flows in the Groot Letaba River.

These investigations found that the positive impact on flows in the river as a result of this afforestation would be fairly limited due to the type of natural vegetation in the areas of concern also being relatively significant water users. The undesirable impact on the regional economy and local employment that deforestation would likely to result in also negate this option. The forestry areas are also in the upper regions of the catchment which is already highly controlled by existing dams. Replacing commercial afforestation with natural vegetation is therefore not considered a viable solution for to the need to improve the ability to manage the water resources in this area.

4.3 CEASING EXPORT OF WATER TO THE SAND RIVER CATCHMENT

An annual allocation of 18, 5 million m³ per annum is exported to Polokwane. This volume is extracted from the Dap Naude Dam and Ebenezer Dam in accordance with long standing allocations and permits. Polokwane does not have reasonable alternatives for importing water and therefore this option would impact significantly on water supply to the Polokwane area. The quantity of concern is also not sufficient to fulfil the requirements identified for this project.

4.4 IMPROVE UTILIZATION EFFICIENCY OF IRRIGATION WATER

Irrigators in the Groot Letaba River system, and particularly those reliant on Tzaneen Dam, are regularly subject to restrictions on the water available.

Allocations are currently curtailed and irrigators receive 50% of the annual quota as a result of the current drought conditions and low levels of water in storage. This has had a significant impact on fruit production and on the socio-economy of the region. The irrigation sector already relies on modern technology and has invested heavily in management and sophisticated equipment to improve water use efficiency. Inefficient flood irrigation methods are rarely encountered in the study area. There is therefore little scope for improvement in this sector.

4.5 DECREASE IRRIGATION ALLOCATIONS

The agricultural sector (fruit orchards dependant on irrigation) and the associated agro-industries provide the majority of employment opportunities in the area (**Table 4.1**).

Industry	Greater Giyani	Greater Letaba	Greater Tzaneen	Ba- Phalaborwa	Maruleng	Mopani District
Agriculture	1797	10798	19321	3286	6077	41279
Mining	233	55	804	5977	131	7200
Manufacturing	640	1371	7741	2653	465	12870

Table 4.1:	Labour Force per se	ector, 2001
------------	---------------------	-------------

4-3

Groot Letaba River Water Development Project (GLeWaP)

Environmental Impact Assessment

Industry	Greater Giyani	Greater Letaba	Greater Tzaneen	Ba- Phalaborwa	Maruleng	Mopani District
Electricity and water	357	299	471	264	78	1469
Construction	1350	1315	2771	1673	572	7681
Wholesale and retail trade	2950	4632	8547	3433	1194	20756
Transport and communication	620	742	1669	765	1117	4913
Financial and business services	1208	819	3018	1695	435	7175
Community, social and personal services	8042	4583	10686	5702	2579	31592
Private Households	1905	1522	5174	2592	1153	12346
Undetermined	1799	1336	5069	2666	1087	11957
Not applicable	108324	93255	157167	52385	38431	449562
TOTAL	129225	120727	222438	83091	53319	608800

Competition for the limited jobs is fierce and unemployment in the area is high (**Table 4.2**) and many people rely on income from family members working in the cities.

Table 4.2:	Percentage distribution	of employment status	s. 1996 and 2001
	i ercentage distribution	or employment status	, 1330 and 2001

Local Area	Employed		Unemployed		Not Working/Other	
Year	1996	2001	1996	2001	1996	2001
Greater Giyani	9.2%	16.2%	9.5%	24.7%	81.4%	59.1%
Greater Letaba	9.0%	22.7%	8.9%	16.6%	82.1%	60.7%
Greater Tzaneen	16.3%	29.4%	9.5%	21.7%	74.3%	49.0%
Ba-Phalaborwa	24.5%	36.9%	10.1%	25.0%	65.4%	38.1%
Maruleng	12.8%	27.9%	9.4%	18.7%	77.8%	53.4%
MOPANI DISTRICT	14%	26%	9%	21%	77%	52%
Source: Census 1996, 2001						

GLEWAP FINAL SCOPING REPORT

Decreasing allocations to the irrigation sector is therefore not recommended.

4.6 WATER LOSS MANAGEMENT: DOMESTIC AND INDUSTRIAL

Effective management systems to counter water loss can most certainly contribute to the increased availability of water. Maintenance tasks such repairs of pipelines must be carried out as part of a comprehensive management system. Estimates, however, indicate that even with optimistic projections, these actions alone will not provide sufficient water to meet the requirements.

4.7 CREATE ADDITIONAL STORAGE

The objective of creating additional storage (in the form of a dam) is for more effective water management in the catchment. The pre-feasibility investigations found that further resource development in the river system was still an option. The following alternative sites for additional storage were investigated (**Figure 4.1**):

- The raising of the Tzaneen Dam Wall;
- Constructing a storage dams at other sites, like Hobson's Choice in the Letsitele River; and
- the Nwamitwa Dam.

4.7.1 Raising of the Tzaneen Dam Wall

It was proposed to increase the capacity of Tzaneen Dam to approximately 203 million m^3 by raising the wall. This could increase the firm yield of the dam by about 6% from 60 million m^3/a to 64 million m^3/a , but more importantly, the dam could then be operated to minimize the frequency and intensity of restrictions on water allocations for the irrigation of permanent fruit orchards. This is a cost-effective alternative that is being investigated further in the post feasibility bridging studies.

4.7.2 Constructing a storage dam at Hobson's' Choice in the Letsitele River

The construction of a storage dam at Hobson's' Choice in the Letsitele River was investigated but was also not found to be economically viable. This option will therefore not be investigated any further.

4.7.3 Constructing a storage dam at Nwamitwa

The construction of a storage dam at Nwamitwa was investigated but was found to be reasonable (but not good). This would need to be considered together with improved water management interventions.

4.8 IMPROVE WATER MANAGEMENT IN ALL USER SECTORS

Although water made available as a result of conservation and demand management strategies and recycling cannot on their own meet the projected requirements, they should and will be implemented in conjunction with the infrastructure development project.