

**IDP**

**INFRASTRUCTURE ANALYSIS**

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# **Contents**

**6/4/1 or 18/1/18**

## **GENERAL**

**Introduction**

**1 SEWERAGE**

**2 SEWERAGE DISPOSAL**

**3 PSE DISPOSAL**

**4 WATER**

**5 ROADS**

**6 STORMWATER**

**7 TRANSPORT**

**8 CONSTRUCTION AND MAINTENACE OF BUILDING**

# IDP INFRASTRUCTURE ANALYSIS

## GENERAL

### Introduction

1. The Matjhabeng area can be divided in 7 main areas i.e. 6 towns and rural areas (farms). The towns are:

- Welkom, Riebeeckstad, Bronville and Thabong
- Virginia and Meloding
- Odendaalsrus and Kutlwanong
- Hennenman, Whites and Phomolong
- Allanridge and Nyakallong
- Ventersburg and Mmamahabane

The rural areas can be seen in two categories i.e.

- Farms
- Plots

### 2. Demographics

	Total Population	No. Erven	Serviced	Not Serviced	Erven Required
Allanridge	1840				
Nyakallong	19390				
Odendaalsrus	9800	3052			
Kutlwanong	76410	12735			
Welkom	46172	11979			
Riebeeckstad	12186	3206			
Bronville	24580	6565			
Thabong	110028	28003			
Virginia	30000				
Kitty					
Meloding	70000				
Hennenman	3577	1118			
Whites					
Phomolong	27087	4591			
Ventersburg	1300	700	393		
Mmamahabane	12884	2384	2521	0	

3. The municipality must render the following engineering services in the towns:

- ⇒ Sewerage disposal
- ⇒ Sewerage treatment
- ⇒ PSE disposal
- ⇒ Water distribution (plan, install, operate and maintain)
- ⇒ Stormwater
- ⇒ Roads
- ⇒ Transportation ( taxi terminal and stop, airport, railway sidings)
- ⇒ Electricity
- ⇒ Street lighting
- ⇒ Construction and maintenance of public buildings and municipal housing

At Hennenman the municipality renders a water service to the Dagbreek and Confido plots, but no sewer service. The farms supply their own water and sewerage.

The services can be divided in two revenue categories i.e.

- ◆ Paying services : water, sewerage disposal and sewerage treatment and electricity.
- ◆ Non-paying services: roads, stormwater and street lights.

Income from the paying services are used to install (loan funding) and maintain the service. The Non-paying services are installed by funds generated out of the selling of the stand and are maintained with funds from property tax. Money generated from the sale of property should be kept in an erf trust fund, to install new non-paying services.

Non-payment of services has however resulted in cash flow problems and the erf trust fund has consequently been depleted To finance operating and maintenance costs. Due to its cash flow problems municipalities cannot obtain loans for capital works and now depends on grant funding to install new infrastructure.

Normally the life span of services is calculated at 20 years with maintenance in between. With proper maintenance the life span of a service can be extended. At this point of time the proper maintenance of services are a problem that must be urgently addressed. Many of the problems encountered are because of a lack of proper maintenance.

Extra pressure is put on the demand for service infrastructure because of the influx of farm workers, the scaling down of the mines, poor economic climate of the region, and more people who are unemployed and can not afford it to stay in their fully serviced home. The aim is to supply every household with a waterborne sewerage and a water connection. National IDP standard is however VIP systems and communal taps.

## 1. SEWERAGE

### 1.1 Causes / Problems

The existing sewer infrastructure for the township areas are a combination between

	<b>Disadvantage</b>	<b>Advantage</b>
Waterborne sewerage	Requires bulk sewer and purification works. Uses a lot of water to operate. The effluent must be treated at great costs. Monthly sewer charges.	Hygienic. Ultimate standard.
Septic tanks / Aqua Privy	Require water to operate. Can pollute the underground water. Can not be used in high populated areas.	No monthly running cost. No bulk sewer to install.
Dry Systems	-	Hygienic. Unlimited lifespan, no monthly sewage charges, no water required, no bulk sewer. No ground water pollution.
VIP	Groundwater pollution. Lifespan = 2 years.	No water required. No sewage charges. No bulk service. Insect free. Hygienic.
Normal pit latrines	Unhygienic, contaminates underground water. Life-span – 2 years.	No water required, no monthly sewage charges, can be installed by owner. No bulk sewer.
Bucket systems	Unhygienic. High operating cost. Foul odours, especially if cleaning intervals are long.	Relative low capital cost to begin system. No water required. No bulk sewer.
No system	Unhygienic. Health risk. Consumers in this category normally install their own pit latrines.	None.

Summarized the following applies:

Affordability	ADVANTAGES	WATER BORNE	SEPTIC TANK / AQUA PRIVY	DRY SYSTEM	VIP	PIT LATRINES	BUCKET	NO SYSTEM
	Hygienic.	4	4	4	4			
	Unlimited lifespan	4	4	4			4	
	No sewage charges.		4	4	4	4		4
	No water required.			4	4	4		4
	No Bulk sewer.		4	4	4	4	4	4
	No Sew works.		4	4	4	4		4
	No Ground water pollution	4		4			4	
	Low initial capital outlay.					4	4	
	Minimum RDP standard	4	4	4	4	<b>5</b>	<b>5</b>	<b>5</b>

**NOTES:**

Only for Rural areas

BELOW RDP STANDARD

The existing bucket systems, pit latrines and no system areas should be addressed. The amount of buckets and no sewerage system has increased in the last 5 years.

One must bear in mind that waterborne sewerage needs water consumption not less than 10 kl per erf per month to operate. If the water consumption is less there is not sufficient floods to flush the solids and external blockages will occur

Pit latrines, some VIP systems and septic tanks tend to pollute the groundwater and are therefor not suitable for densely populated areas. Therefore, if a sewerage system is considered, the effect on the environment must also be investigated. Some people are dependent on groundwater for domestic use and can be negatively affected because of contaminated ground water.

Sanitation	Allanridge	Odendaals-rus	Welkom	Virginia	Hennen-man	Venters-burg	Total
<b>Formal stands</b>							
- None	0	0	0	545	0	0	
- Pit Latrines	0	0	0	0	0	0	
- Bucket sanitation	0	4275	0	5784	4208	184	
Suction Pits	0	0	50	0	245	0	
-VIP toilets	0	0	39	0	0	0	
-Waterborne	3751	9448	36823	10090	2063	2875	
<b>Informal settlement</b>							
- None	0	1907	7815	0	0	0	
- Pit Latrines	973	0	0	291	0	0	
- Bucket sanitation	0	953	0			0	
-VIP toilets							
-Waterborne							

## 1.2 Trends

Very little housing development took place the last few years. Developments that did take place are at high service standards. There is an oversupply of stands with high service levels and under supply of stands at RDP standards with the result that many people can't afford the cost of services.

- People who can not afford a stand or to rent a portion of a stand must stay on informal settlements.
- No schools or businesses can be built because no services are available. As a result people staying in undeveloped areas tend to walk further to schools and businesses.
- Non payment is high.

In the Welkom CSM (2000) the following statistics of the level of service versus income was stated:

**Table 4.12 Existing Services Profile in Welkom : Sanitation**

Income (R/month)	Income profile %	No of formal Households with services	Have Basic Service (VIP)	Have high Level of Service (WATER BORNE)	No. of households mismatched to level of service
Less than 800	41	15,182	0		-15182
800 to 1 500	21	7,776			-7776
1 500 to 3 500	17	6,295		18,823	+12528
> 3 500	21	7,776		16,546	+9870
TOTAL	100	37,030			

"-" denotes too few with desired level of service package

"+" denotes too many with desired level of service package

From the above figures it is evident that through previous service delivery programs, some low income households have been provided with service levels which are above

affordability levels, which results in inability to pay for the true cost of services and thus loss of income to the municipality.

### **1.3 Impact**

Development happens slower than what is required because of:

- the high goals set for service levels,
- the shortage of funds to install infrastructure,
- backlog on availability of developed stands,
- stands that are proclaimed but in the possession of developers who do not perform. People tend to stay longer than was anticipated in informal areas or areas without proper infrastructure. It is expensive to temporarily develop these unproclaimed areas as these services are not upgradable or must be discarded if the area is not suitable for township development or a new layout has to be planned.
- The cost of bulk infrastructure is approximately half the cost of internal infrastructure. The higher the level of service is, the more the bulk services cost. When more stands are serviced with waterborne sewerage it must be born in mind that there will be more water runoff and the sewerage treatment works will have to be upgraded.

### **1.4 Weaknesses**

Higher than affordable service levels is perpetuating informal settlements. These people lack any sense of permanency which destabilises the social fabric.

### **1.5 Resources available**

The Council has ground available for development. Depending on the level of service required it can be costly to develop some of these areas, but with RDP standards the cost of bulk services could be minimised.

The mines have infrastructure that must be demolished with the scaling down process. Existing buildings, sewer systems and even sewerage treatment plants are not utilised to their full extent.

The Virginia and Theronia sewerage works have spare capacity that can handle new development of about 10 000 stands each. The conditions of Theronia and Witpan sewerage works are very poor and must be upgraded.

## **4. WATER**

### **Introduction**

Water is a basic human necessity. Access to water is a Constitutional right. Free water of 6 kl/month per stand has been granted to each household in Matjhabeng. The RDP standards states that communal taps at a approximate distance of 200 meter walking distance should be provided.

Water	Allanridge	Odendaalsrus	Welkom	Virginia	Hennenman	Ventersburg	Total
<b>Formal</b>							
Households formally settled			37030				
Metered		9100	30289	7615			
Un-metered		615					
Yard Tap				2600			
Public Tap		2500	6734	3128			
- None	0	2700	0		0	0	
Other				291			
Total							

#### 4.1 Causes / Problems

The level of service in Matjhabeng varies from fully metered high-pressure areas to areas without any meters, areas with low water pressure, communal standpipes and areas without any water.

The standard that we would like to set is for each stand to be serviced with a metered water connection. However, many people in the community can not afford this standard. Council must have a means of ensuring that consumers who use more than 6 kl/month pay for their water, because unpaid usage places a heavy burden on Council's cash flow. Many of the above mentioned problems can be overcome with the use of prepaid water meter systems, but is expensive to install. On the other hand unpaid for consumption is also expensive and it would pay to install prepaid meters just to cut this loss.

## 2 Trends

The higher the level of the people's living standards are, the more water they use. Level of service and the size of a stand also have an effect on water usage.

In the Welkom Combined Services Model (2000) the following was concluded:

***Services profile (excluding informal areas) vs. household incomes showing mismatch between current provision and affordability.***

***Table 4.11 Existing Services Profile: Water***

Income (R/month)	Income profile %	No of Households formally settled	Have Basic Service (Standpipes)	Have Intermed Service (Yard taps)	Have Level (High) Service (House connection)	No. of house-holds mismatch-ed to level of service
Less than 800	41	15,182	0			-15182
800 to 500	21	7,776		6,734		-1042
1 500 to 3 500	17	6,295			13,743	+7448
> 3 500	21	7,776			16,546	+9870
	100	37,030				

"-" denotes too few with desired level of service package

"+" denotes too many with desired level of service package

*From the above figures it is evident that through previous service delivery programs, some low income households have been provided with service levels which are above affordability levels which results in inability to pay for the true cost of services and thus loss of income to the municipality.*

Households staying in informal areas without proper access to water should be addressed.

#### **4.3 Impact**

Nobody can live without water. Water is necessary for

- Drinking
- Preparing food
- Hygiene

Lack of access to water can have a social effect. A person that can not clean himself could have a difficult time to find a good work. Children can suffer at school from mockery of friends because they are not clean.

#### **4.4 Weaknesses**

Water is scarce. Government set up expensive infrastructures to try and ensure that water is available for usage through out the year. Matjhabeng is far from a large supply of relative good water that can be used for domestic use. Most of Matjhabengs water comes from the Vaal river. Water is purified at Balkfontein by Sedibeng water and pumped 80 km to the Goldfields. The Vaal river gets some of its water from the Lesotho High Land Scheme. Users of water from the Vaal river pay extra for water to help with the redemption of Lesotho High Land Scheme.

If there is excess water in the Sand river, Sedibeng has a water purification plant that has the capacity to purify 120 ML per day. The limitations on the amount of water allow them to do 36 ML/day for 3 months. Matjhabeng council area has a water demand of approximately  $\pm 2000$  Mega liter per month or 70 ML/day. (Mines usage excluded).

#### **4.5 Resources available**

Sedibeng water has the capacity and infrastructure to supply the Goldfields with their water needs.

Council's vehicles and equipment is in a poor condition: 13 years and old on average. This makes it difficult for the Council to maintain the existing infrastructure.

Council has competent personnel with knowledge of installing and maintaining water systems.

## **5. ROADS**

### **INTRODUCTION**

Roads are a non-income service, but is not less important than other income generating services provided by a Municipality. If the road network is not maintained properly, it can lead to serious damage to vehicles, loss of income by businesses, decline in tourism and loss of life. The ever increasing volume of traffic on the roads, especially heavy traffic, makes it that more important that a proper maintenance programme is in place.

### **5.1 CAUSES/PROBLEMS**

The Road Hierarchy consists of the following functional classification:

- Primary distributors
- District distributors
- Local distributors
- Access distributors
- Access collectors
- Private roads

The above classification, plus the volume and type of traffic that make use of the roads, have an important role in determining maintenance needs and priorities. There are three types of roads in the network classified according to their structure and type of seal (if any).

- Roads with a proper structure and seal (tarred roads)
- Roads with a gravel layer but no seal (gravel roads)
- Roads with no structure or seal (dirt roads)

The main causes of weathering of roads are the following:

- Type of traffic
- Weather conditions
- Ingression of water
- Nature of soil conditions
- Type of seal
- Type of structure
- Poor stormwater system
- Poor maintenance

To ensure that the roadnetwork is maintained, a Pavement Management System should be compiled and maintained. The Pavement Management System consists mainly of the following elements:

- Condition survey of all the roads
- Analysis of the data
- Priority listing
- Recommended maintenance programme
- Proposed budget

The type of maintenance could consist of the following:

- Petty patching (small potholes)
- Major patching
- Resealing of roads
- Rebuilding (partly or in totality)

Apart from the normal wear and tear on roads, a further problem is that roads are crossed by various underground cables, for example:

- Water pipes
- Sewer pipes
- Electrical cables
- Telkom cables
- Stormwater pipes

If any of the above needs maintenance or needs to be replaced, the road must be reinstalled at fairly high costs.

## **5.2 TRENDS**

Complaints are received on a daily basis regarding the following:

- Very poor dirt roads
- Gravel roads not maintained
- Potholes in tarred roads
- Crossings over tarred roads not maintained
- Water standing in roads
- General poor maintenance

The above complaints increase dramatically after adverse weather conditions.

## **5.3 IMPACT**

The impact as a result of the poor condition of the roads are the following:

- Damage to vehicles
- Claims against Municipality
- Loss of income for businesses
- Negative effect on emergency services (ambulance, fire, security and police)
- Decline in tourism
- Negative impact on public transport

Because of poor or no maintenance over a long period, the result could be that the whole road infrastructure will have to be rebuilt.

## **5.4 WEAKNESSES**

Although a Pavement Management System is in place, no funds were available for the past three years to do any of the proposed maintenance work. The result

will be that many of the tarred roads will have to be rebuilt. Due to a lack of funds and poor equipment, gravel and dirt roads cannot be maintained, as it should be.

## **5.5 RESOURCES AVAILABLE**

The equipment available is insufficient and in poor condition. Some of the equipment cannot be utilised because Operators and Drivers are not available.

## **6. STORMWATER**

### **Introduction**

Stormwater is a non-income service. It is however not less important than sewerage or water. If stormwater is not managed correctly it can lead to loss or damage to property, loss of life or disruption of traffic or other services.

When stormwater accumulates it must be managed. 1 Cumec ( $1 \text{ m}^3/\text{s}$ ) of stormwater is 1 ton of water flowing past a point every second. An average car weighs one ton. One can thus say it is one car passing at a point every second. The Power Canal has a capacity of 15 cumec.

### **6.1 Causes / Problems**

Stormwater causes problems at the following places:

- Low laying areas
- Marshy areas
- Access to erven
- Road intersections

Accumulated Stormwater in road reserves are collected in minor systems. These minor systems accumulate to major systems. When designing stormwater systems the following rules apply:

- Minor systems are designed so that the 1 in 5 year's storm recurrence interval can be handled in the system without disruption to traffic.
- Major systems are designed so that 1 in 20 year's storm recurrence interval can be handled in the system without damage to property and the 1 in 50 year's storm recurrence interval can be handled without loss of life.

Stormwater major and minor systems must be inspect regularly for blockages. Blockages are caused by:

- Silting up of sand
- Rubbish dumped in the systems (especially open systems)
- Plants (like reeds) growth in open systems

Stormwater runoff can increase up to 4 times the virgin flow because of :

- New development in the catchment area.
- Condensing of development
- Change in usage i.e. building of shop centres with paved areas.
- Upgrading of area
- Decreasing of grass areas

## **6.2 Trends**

After rain storms complaints are received where damage occurred because of :

- Poor maintenance programs
- No or under developed stormwater systems

As floods do not occur regularly, people tend to forget or ignore stormwater issues, but when flooding occurs the damage is usually serious and very expensive.

## **6.3 Impact**

Houses and businesses are flooded and great damage to property can occur. In extreme cases loss of life may occur. Valuable items of people can be damaged which no monetary values can replace. If loss of life occurs, families can be left without income. If a person suffering from stormwater damage does not have any insurance it can ruin him. Big claims against the council can be filed if proved that Council was negligent by not installing or maintaining a proper system.

## **6.4 Weaknesses**

Because of lack of funds and personnel no proper stormwater management system is in place. There are places that have been flooded for years without the problem being fixed. New development took mostly place at the top end of a catchment area. The old systems normally does not make provision for this extra runoff from these areas.

## **6.5 Resources available**

Council equipment is in a poor condition: 13 years and older on average. The result is that Council can hardly maintain the existing infrastructure.

Council has personnel with knowledge of installing and maintaining stormwater systems.

## **7. TRANSPORTATION**

### **Introduction**

Transportation can be categorised in the following service areas:

- Roads system (National, Provincial and Municipal)
- Aviation
- Railway
- Public transport

Roads can be classified according to network capacity and function in the following categories:

- Primary distributors class A & B: National and Provincial roads
- District distributor
- Local distributor
- Access distributor
- Access collector

Provincial Government and National Roads are responsible for installing and maintenance of Primary distributors.

Aviation focuses on fast transport of people and goods but less bulky and less weight.

Public transport makes use of the following media:

- train,
- bus
- taxi or
- aeroplane.

Matjhabeng is centrally located and has relative good road infrastructure connections to Kroonstad (N1), Durban, Bloemfontein, Kimberley, Klerksdorp and Johannesburg. The N1 passes through Ventersburg. The present road infrastructure was negotiated with Province. Some of the main arterials that were planned are still not in place, but most of the crucial routes were built or is under construction.

The following reports deal with roads in the Matjhabeng area and are available at the Directorate Engineering Services:

- Welkom Transportation Plan: Taxi Study (May 1987).
- Goudvelde Vervoerstudie; VKE (Oktober 1987).
- Welkom Metropolitaanse Vervoergebied; VKE (Februarie 1988).
- Welkom oostelike verbypad P3/2; VKE (Maart 1988).
- Ondersoekverslag na die uitvoerbaarheid van die verbinding tussen Stateway en P3/2; Bouwer Viljoen Ing. (November 1988).
- Openbare Vervoerondersoek: Welkom; Department of Transport. (1989).
- Guidelines for the design of Combi Taxi Facilities: VKE (June 1989).
- Welkom Transportation Plan: Transportation System Management: Identification of improvements, Needs and Potential; VKE (July 1991).
- Goudveldmet: Eerste Stedelike Vervoerplan: Studie-ontwerp: Verslag 1; VKE (1992)

## **7.1 Road network**

### **7.1.1 Causes / Problems**

Matjhabeng's traffic problems can not be compared to big places such as Gauteng or Cape Town. We do however also have accessibility and capacity problems that should be addressed. Places like Thabong, Mmamahabane, Nykalong, Meloding and Pomolong can do with extra access routes. The occupants of Ventersburg experience certain times of year (school holidays) major problems to cross the N1 road between Mmamahabane and Ventersburg. Occupants of Thabong must detour a long way if they want to drive east from T14 area.

The condition of our roads has an influence on the speed one can drive, maintenance and life span of a vehicle. Because of potholes in roads many accidents occur between vehicles, pedestrians and vehicles that are damaged..

Because little maintenance is done on existing paved roads, the roads deteriorate to such an extent that it can not be repaired but will have to be rebuilt.

Building of roads is a very costly exercise that we can hardly afford. To rebuild a road because of lack of maintenance is a financial mistake.

### **7.1.2 Trends**

Accessibility and new main routes was built or is in contraction phases that alleviating some of Mutjhabeng's trafficking problems. Provincial Administration is involved in most of these construction programmes. Because of new development planed Provincial Administration should be requests to budget for new roads where accessibility problems are foresee.

The condition of some of the roads in Matjhabeng is busy to deteriorate at a very fast pace.

### **7.1.3 Impact**

Because of the condition of roads and poor accessibility to certain areas new developers may decline to develop or expand in the Goldfields.

### **7.1.4 Weakness**

The Council is not financially strong enough to build and extend the road infrastructure. Council has little influence in Provincial Administration prioritising of their road hierarchy to alleviate the problems in this area.

### **7.1.5 Resources available**

Transportation plans were done and we know where most of the problems exist and what must be done to alleviate the problem.

## **7.2 Public Transport**

### **Introduction**

The ideal situation will be for every one to get from point A to B as quick, safe and cheap as possible. Public transportation tends to try and provide this service.

Public transport focus moves from bus and train services to taxis in the last 10 to 15 years. Taxi service can operate much closer to the residence home where the need is. Taxi services are more users friendly than bus and train services.

### **7.2.1 Causes / Problems**

For the public transport to operate effectively some busstops and taxi ranks must be constructed. Some of the existing features are overcrowded. There are to few busstops, especially on main routes, where taxis and busses can stop safely.

### **7.2.2 Trends**

There was an increase in the amount of taxis that operate in the Mutjhabeng area.

### **7.2.3 Impact**

Residence used taxis to get to work, get to home, to go and visit family / friends and to commute to Homelands. If the service is not available it will restrict people to one place that will have a negative effect on their culture and humanity.

### **7.2.4 Weaknesses**

People who can not afford the taxis have no alternative way of commuting.

### **7.2.5 Resources**

None

## **7.3 Airport**

### **Introduction**

Welkom has a class ?? airport. At Virginia there is also a tarred airstrip. The other towns of Matjhabeng only have ground airstrips. At Hennenman there is a Glider Club.

During the late 80's the following reports were compiled:

- Ondersoek: Opgradering van die lughawe P Bester 1987
- Airport planning & design Experience VKE
- Lughawe ontwikkelingsplan R Spies 1990

During 2000 it was investigated to upgrade the airport into a national freight airport. Plans are still in place for it.

### **7.3.1 Causes / Problems**

There is an urgent need for airfreight to Europe from South Africa and Matjhabeng is well situated for it. Large sums of capital are needed for development of an airfreight airport.

### **7.3.2 Trends**

The need to get the product quicker (in a shorter time) on the overseas markets, drive the urgency of the freight airport.

### **7.3.3 Impact**

The financial impact on the area and job creation is to the benefit of Matjhabeng.

### **7.3.4 Weaknesses**

Matjhabeng is far from a major airport to quickly ship perishable products. Matjhabeng's economy is in a declining state. The longer it takes to get the project of the ground, the slimmer the chances get that we can capitalize on the opportunity

### **7.3.5 Resources available**

Agriculture can produce the products needed to justify the capital layout needed to build in higher standard airport.

## **8. BUILDINGS**

### **Introduction**

The Matjhabeng Council owns various buildings, e.g. residential houses, offices, workshops, substations, libraries, clinics, pump stations and commercial buildings which are rented out like the Commissioner building, etc. At Welkom the following reports was tabeled before Council

- Stadsingenieurs diverse verhuurde eiendomme (Maart 1992)
- Personeelwoningen: Driejaar opgraderingsverslag (Oktober 1993)

### **8.1 Causes / Problems**

Maintaining and administrating Council's buildings, place a heavy burden on Council's resources. The problems experienced with the buildings in Council's possession, is mainly lack of funds for maintenance and administration of the buildings. Some of the buildings deteriorated to an extend where the building is hardly useable anymore.

### **8.2 Trends**

Some Council buildings was sold. There is a policy to sell personnel houses to its occupants, depending on certain rules.

### **8.3 Impact**

By minimising the number of houses and buildings Council could save maintenance money and attend to their core functions namely service delivery. Some of the leases of buildings are less than the income that can be generated out of property taxes.

### **8.4 Weaknesses**

If there is a shortage of houses to rent in the open market and Council want to do new appointments, it is easier to negotiate with an applicant if you can supply housing at affordable rents.

### **8.5 Resources available**

Council does not have the personnel to maintain all its buildings. Contractors will have to be appointed. We do have the people to supervise the building of houses or structures.

# **INTEGRATED DEVELOPMENT PLANNING**

## **PURIFIED SEWERAGE WATER**

### **INTRODUCTION**

Purified sewerage water can be an income generating service. It is very important to get rid of excess purified sewerage water. Currently it is drained in lakes which contains limited space. To high pan water levels or exuberating of the lakes may have a negative impact on development near pans. In order to market purified sewerage water effectively, there must be a method to get rid of excess purified sewerage water in times of abundance i.e. winter time. According to the Water Act purified sewerage is supposed to be put back in a public stream.

### **1. CAUSES/PROBLEMS**

Excess purified sewerage water causes problems in the following areas:

- A high water level in Witpan threatens Witpan Sewerage Works
- A high water level takes up development space.
- A high and low pan water levels can have a negative impact on development because high and low marks can be far apart.
- Pans is a natural pond of stormwater runoff. Spillage of purified sewerage in pans lower the capacity needed for stormwater.
- Because of high pan water levels an impression is created with certain bulk users, that the council can not manage the excess water. The bulk user help the Council by using some of this water for their own purposes and are therefor not prepared to pay for their water.

Water consumption differs from season to season. In winter, there is a excess of purified sewerage water available, but in summer time, especially during dry spells, a shortage is experienced.

- Council does not have an infrastructure to perform optimal marketing.
- Contracts with companies/institutions has expired and were not kept up to date.
- The network experience problems with pressure as a result of upgrading that were not executed - Lack of funds to do capital lay-out.
- Marketing of purified sewerage water can not be done - Permit restrictions.

An increase of purified sewerage water can be experienced because of:

- New developments
- Increase in wet industries
- Seepage of stormwater into the sewerage systems.
- Poor maintenance to the sewer network.

### **2. TRENDS**

Private house owners as well as mine groups have already established partly re-using of sewerage runoff. During winter, levels in the lakes increases because of less evaporation and less irrigation needs. It results in:

- Overflow of the lakes
- Endangering of mine shafts
- The impression is created that there is always excess purified sewerage water available.

- High levels in Witpan endanger Witpan Sewerage works.
- Mine groups held the municipality partly responsible where excess purified water flooded some of their dirty water system that results in pollution of areas downstream.

### **3. IMPACT**

A high water level in pans creates the impression that purified sewerage water is a liability and not an asset to Council. This make it difficult to market purified sewerage water. In the past the income of purified sewerage water were used to finance capital developments on purified plants. For this purpose a fixed quota of purified sewerage water was offered to mine groups. In order to rectify some of the above problems the following must be addressed:

- If no method can be found to get rid of excess purified sewerage water, the impression that excess purified sewerage water is always available will be maintained, and the marketing thereof will be difficult.
- The network problems must be addressed in order to ensure optimal use of the existing infrastructure.
- Current permit requirements must be extended to secure wide spread marketing.
- Additional control measures must be established to reduce the health risk linked to purified sewerage water.
- Active marketing and information sessions must be held to school the public in using of purified sewerage and dangers relate to purified water.

### **4. WEAKPOINTS**

- Purified sewerage water has a negative image because health risks are connected generally to this water.
- Due to poor maintenance to equipment on the sewerage plants the quality of purified sewerage water can not be guaranteed.
- According to permits purified sewerage water is supposed to be drained back into a public stream because the law reckoned it is public property.
- The networks experience certain pressure problems.
- Due to lack of funds maintenance was not done properly on the networking for the past few years. This resulted in a network that is in a poor state.

### **5. RESOURCES AVAILABLE**

- 5.1 Development reports and water balance system reports has already been brought set up and tabled before Council. The only limitation for implementation of these reports is the lack of funds.
- 5.2 There is a high demand for purified sewerage water, especially for mine rehabilitation. Approximately 20MI additional purified sewerage is available if certain problems can be overcome.
- 5.3 Initial steps for the relaxation of restrictions on permits for purified sewerage water are done already. A pilot project and quality control criterion has already been determined.
- 5.4 Monitoring resources is already in place – minimum additional equipment is required.