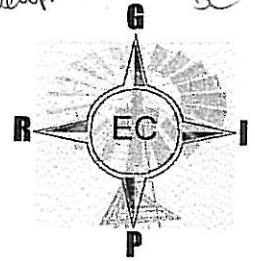


**GROUNDWATER RESOURCE INFORMATION PROJECT
EASTERN CAPE PROVINCE**

*Water Services
Development Plan EC*

GROUNDWATER INFORMATION SOURCE REFERENCE SHEET



**SOURCE
REF NR:**

SR 188

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A: SOURCE DESCRIPTION

District Municipality:	Amatole	Chris Hanani	O.R Tambo
	Ukhahlamba	Cacadu	Alfred Nzo
Local Municipality:	KOU KAMMA		
Institution where Information is held:	KWEZI V3 ENGINEERS		
Branch of Institution:	PORT ELIZABETH		
Contact details:	Contact person:	G KRUGER	
	Contact Tel:	041-3918811	
	Contact Email:	portelizabeth@v3.co.za	

B: TYPE OF INFORMATION

Information format:	Hard copy	<input checked="" type="checkbox"/>	Data Summary	<input type="checkbox"/>	Electronic Report	<input type="checkbox"/>
Report / Info Title:	Specify Other:					
	KOU KAMMA MUNICIPALITY: WATER SERVICES DEVELOPMENT PLAN					
Report Nr:	189610QO	Date:	JULY 2003			
Author Details:	GERT KRUGER					
Author's Qualification:	Hydrogeologist	<input type="checkbox"/>	Govt Dept	<input type="checkbox"/>	Project Manager	<input type="checkbox"/>
	Engineer	<input checked="" type="checkbox"/>	Technician	<input type="checkbox"/>	Other	<input type="checkbox"/>
Captured by:	Specify Other:					
PS. Nel	Date:	12/03/2004	Signed:			

C: GEOHYDROLOGICAL CATEGORIZATION

Project Type	Source development	<input type="checkbox"/>	Feasibility Study	<input type="checkbox"/>	Sanitation Study:	<input type="checkbox"/>
	Specify Other: WSDP					
Reference Co-ordinate:	Latitude	Longitude				
	N/A	N/A				
Lithological & Construction Logs Hydrocensus Data Pump Testing Data Chemical Water Analysis Data Geohydrological Data Spring Data Remote Sensing Data Map Data	Yes	No	Complete	Incomplete		
		<input checked="" type="checkbox"/>				
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	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		
		<input checked="" type="checkbox"/>				
	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			

Comments:

Reviewed by: **JU du Plooy** Date: **14/03/2004** Signed:



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 Your ref. : 13/2/1/1LETTER/SNYMAN/100SM
 Date : 22 AUGUST 2003

ATTENTION: MR P SNYMAN

The Municipal Manager
 Cacadu District Municipality
 P O Box 315
 PORT ELIZABETH
 6000

Sir

KOU KAMMA MUNICIPALITY : WATER SERVICES DEVELOPMENT PLAN

Attached hereto is the WSDP (Draft) for the above-mentioned municipality for your perusal and comment.

Please contact the undersigned if you need any additional information.

Yours faithfully

H G KRUGER Pr Eng
 p.p. : **KWEZI V3 ENGINEERS**

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DEPARTMENT: WATER AFFAIRS AND FORESTRY
REPUBLIC OF SOUTH AFRICA

WATER SERVICES DEVELOPMENT PLAN

KOU KAMMA MUNICIPALITY

DRAFT

JULY 2003

**THE MUNICIPAL MANAGER
KOU KAMMA MUNICIPALITY
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Prepared by :

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KOU KAMMA MUNICIPALITY

WATER SERVICES DEVELOPMENT PLAN

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189610QO/03 – SCHEMATIC LAYOUT : KAREEDOUW BULK WATER AND SANITATION INFRASTRUCTURE

189610QO/04 – JOUBERTINA BULK WATER LAYOUT

189610QO/05 – SCHEMATIC LAYOUT : JOUBERTINA BULK WATER AND SANITATION INFRASTRUCTURE

189610QO/06 – RAVINIA LAYOUT PLAN

189610QO/07 – STORMSRIVIER LAYOUT PLAN

189610QO/08 – WITELSBOS LAYOUT PLAN

189610QO/09 – WOODLANDS LAYOUT PLAN

189610QO/10 – CLARKSON LAYOUT PLAN

189610QO/11 – KRAKEELRIVIER LAYOUT PLAN

189610QO/12 – LOUTERWATER LAYOUT PLAN

189610QO/13 – MISGUND LAYOUT PLAN

ANNEXURE G – Useful Contacts

ANNEXURE H – References

i) Preface

This Water Services Development Plan (later referred to as the WSDP) was written and compiled as a legislative measure in order to comply with the terms of the Water Services Act (Act 108 of 1997) in consensus with the National Water Act (Act 36 of 1998).

The WSDP is a supplementary document to the Integrated Development Plan (IDP) of the Municipality and consists of a more detailed elaboration on the status quo and future plans for water services and sanitation.

ii) Introduction

In order to comply with the Water Services Act (Act 108 of 1997) and the National Water Act (Act 36 of 1998), Cacadu District Municipality, on behalf of the Council of Kou Kamma Municipality (later referred to as the Water Services Authority or WSA) appointed Kwezi V3 Engineers to assist them in formulating a WSDP for submission to DWAF. This document will also serve as a planning tool and barometer against which the quality and efficiency of water services and sanitation delivery as well as the eradication of the backlog in service provision can be measured.

iii) Background

The Kou Kamma Municipal District, one of the jewels of the Eastern Cape Province, is situated along the Indian Ocean coastline in the south western sector of the province, abutting the Western Cape Provincial Boundary to it's west, the Baviaans Municipality to it's north and the Kouga Municipality to it's east.

The boundaries, as proclaimed in terms of Section 21(B) of the Local Government : Municipal Demarcation Act, 1998 (Act 27 of 1998), was used for the purpose of compiling this Water Services Development Plan. Refer to Figure1 for the locality and drawing no. 189610Q0/01 for the general layout of the study area.

The Kou Kamma Municipal area falls within the Temperate Coastal Region, which is characterised by warm summers, moderate to cool winters and rains throughout the year. It is also under laid with rich fertile soils, which is extensively farmed or used for forestry. The prime land use patterns in the study area are agriculture and forestry, conservation, natural veld and mountainous areas and urban and rural residential nodes.

The Kou Kamma Municipal area covers approximately 12540 km² which is geographically divided into two distinctive areas by the Tsitsikamma mountain range. The coastal belt area to the south of the mountain range is known as the Tsitsikamma and the inland area to the north as the Langkloof.

The Study area is subsequently subdivided into four Wards for more strategically enhanced management purposes. The towns in the different Wards are as follows:

Ward 1

- Coldstream
- Koomansbos
- Stormsrivier
- Goesa
- Thornham
- Griqua Rust
- Sanddrif
- Blikkiesdorp
- Kwaaibrand

Ward 2

- Woodlands
- Eersterivier
- Clarkson
- Wittekleibos
- Kareedouw
- Guava Juice

Ward 3

- Twee Riviere
- Joubertina
- Krakeelrivier

Ward 4

- Louterwater
- Misgund / Proefplaas

Kareedouw and Joubertina, as former TLC's and current Municipal administrative nodes, are the only towns depicting significant urban characteristics, and would therefore be the only towns with an in-depth coverage regarding water services and sanitation in this WSDP. All the other towns mentioned above depicts an ultra-rural milieu and originated primarily as residential facilities for farm workers of surrounding farms. These towns will therefore only be covered in general, with their respective water and sanitation infrastructure characteristics in the Rural Township WSDP (WSDP 3) in this document. The reason for this is, since these townships all have their own water sources, the exercise of doing a water balance would not deflect a true representation of the existing scenario.

1. ADMINISTRATION

The following information is purely administrative and indicates the significant role players responsible for the compilation of this WSDP.

1.1 Name and Address of WSA

1. Name	KOU KAMMA MUNICIPALITY
2. Address	P.O. BOX 11 KAREEDOUW 6400
3. DM Reference No	EC109

1.2 Contact person/person

Name	Position	Tel Number	Email
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Mr M Ndokweni	Municipal Manager	042-288 0303	Kareedouw@intekom.co.za
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Mr G Kruger	Consultant	041-391 8811	hgkruger@kv3.co.za

1.3 WSDP Drafting Team

Since the WSDP needs to be integrated with the IDP it was deemed necessary to indicate both the representatives of the WSDP and IDP drafting teams, which is respectively as follows:

Name	Organisation	Telephone number
Mr M Ndokweni	Kou Kamma Municipality	042-288 0303
Mr T Mosia	Kou Kamma Municipality	042-288 0303
Mr J Ruiters	Kou Kamma Municipality	042-288 0303
Mr N Oudshoorn	Kou Kamma Municipality	042-288 0303
Mr T Möhr	Kou Kamma Municipality	042-288 0303
Mr D Cunningham	Kou Kamma Municipality	042-288 0303
Mr T Macelesi	Kou Kamma Municipality	042-288 0303
Natalie Kiewietz	Kou Kamma Municipality	042-288 0303
Clr O'Connell	Ward Councillor / Exec. Mayor	042-288 0303
Clr J Kettledas	Ward Councillor	042-288 0303
Clr J Yake	Ward Councillor	042-288 0303
Clr D Strydom	Ward Councillor	042-288 0303
Clr K Jacobs	Ward Councillor	042-288 0303
Clr M Hartz	Ward Councillor	042-288 0303
Clr F Strydom	Ward Councillor	042-288 0303
Clr N Mntambo	Ward Councillor	042-288 0303
Mr R Ceaser	Kwezi V3 Engineers	041-391 8811
Mr G Kruger	Kwezi V3 Engineers	041-391 8811

1.4 IDP Drafting team

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Clr M Ndokweni	Municipal Manager	042-288 0303
Mr T Mosia	Man. Technical Services	042-288 0303
Mr J Ruiters	Technical Services	042-288 0303
Mr N Oudshoorn	Treasurer	042-288 0303
Mr T Möhr	Technical Services	042-288 0303
Mr D Cunningham	Technical Services	042-288 0303
Mr T Macelesi	Kou Kamma Municipality	042-288 0303
Clr J Kettleidas	Ward Councillor	042-288 0303
Clr J Yake	Ward Councillor	042-288 0303
Clr D Strydom	Ward Councillor	042-288 0303
Clr K Jacobs	Ward Councillor	042-288 0303
Clr M Hartz	Ward Councillor	042-288 0303
Clr F Strydom	Ward Councillor	042-288 0303
Clr N Mntambo	Ward Councillor	042-288 0303
Robert Reed	Ward 1 Representative	083 478 0848
Hester Pullen	Ward 1 Representative	082 393 7641
Francois Strydom	Ward 2 Representative	082 825 6020
Nomakhaya Duma	Ward 2 Representative	042 288 0599
Nigel Williams	Ward 3 Representative	
Desmond Strydom	Ward 3 Representative	083 309 6387
Kevin Wewers	Ward 3 Representative	042 273 2410
Michael Hartz	Ward 4 Representative	083 309 6395
Lizette Marce	Ward 4 Representative	082 215 5325
Nigel Williams	Ward 4 Representative	042 272 1639
Elvin Petersen	Cold Stream Development Committee	
Francois Strydom	Democratic Alliance	
Lofty du Bruyn	Humansdorp Commando	
Robert CR Reed	Storms River Ratepayers Association	
Jacky R Joseph	SADTU	
Bennet Lewis	Bluelilliesbusch School Governing Council	
Vusumzi Fitoli	ANC Sand Rift Branch	
Simon Solomon	ANC Stormsriver Branch	
Lydia Pedro	ANC Coldstream Branch	
Sharonick C Wogane	Tsitsikamma ANC Youth League-Coldstream	
Joyce Blom	Sandrift ANC Women's League	
Hester P Pullen	Stormsriver Community Policing Forum	
Althea Goeda	Stormsriver Development Committee	
Isak J Africa	Sandrift Development Committee	

DannyBoy Ncethezo	Woodlands Development Committee	
Brendon T Jantjies	Kareedouw Gemeenskapspolisierings Forum	
Chris Theunissen	Kareedouw Development Forum	
Michiel A Strydom	Kou Kamma Inwoners Vereniging	
Mlibosi David Mbeki	Clarkson Development Committee	
Bongiswa Yake	ANC Kareedouw	
Bequty Didida	ANC Woodlands	
Edna N Mntambo	ANC Clarkson	
Annie Pause	ANC Women's League Clarkson	
Miriam Nombande	ANC Women's League Kareedouw	
E Draai	ANC Youth League Kareedouw	
Roderick P Draghoender	SADTO Kareedouw	
Basil Paulsen	Kareedouw Economic Dev Company	
Daniel T du Preez	Zuuranys Landbouvereniging	
Nomakhaya Duna	SANCO	
Jeffrey Ruiters	Kareedouw Sportbeheerraad	
Maria Pedro	Netball Club	
Juanita Jonkers	Kareedouw Wykskomitee	
Antoinette Kritzinger	Humansdorp Kommando	
Francois Strydom	Alliansie	
Ella Scott	Langkloof Landbou Genootskap	
Anton A vd Mescht	Langkloof Sakekamer	
Desmond Strydom	Demokratiese Alliansie	
Sabina Plaatjies	African National Congress	
Virginia L MacKay	ANC – Welfare Committee	
Stefanus Le Roux Kemp	Langkloof Commando	
Frans J J Stapelberg	Kerkraad NG Kerk Joubertina	
Kevin Wewers	Development Forum Joubertina	
Brahndon Jacobs	Development Forum Joubertina	

1.5 Participation Process

Section 14 of the Water Services Act requires that the Water Services Authority (WSA) must take reasonable steps to bring its draft WSDP to the notice of a number of different stakeholders so that they have the opportunity to comment on it. Section 15 of the Act requires that the WSA must supply a copy of the WSDP to the Minister of Water Affairs and Forestry, Minister of Provincial and Local Government, the relevant Provincial Government and all neighbouring WSAs.

Meetings and continuous consultation amongst all the relevant stakeholders were conducted on a regular basis as part of the Public Participation Process. Questionnaires regarding water services and sanitation were prepared by the Consultants and handed out to Councillors in different wards and completed by residents in different areas. The results of the questionnaires are summarised in Annexure A in this document. The total number of questionnaires will be documented as Appendix A and will be available on request.

Stakeholders	Level of Involvement (Yes / No)		
	Informed of WSDP process	Participated in planning workshops	Draft made available
1. Domestic consumers	√	√	X
2. Potential domestic consumers (not served at present)	√	√	X
3. Industrial consumers	√	√	X
4. Commercial consumers	√	√	X
5. Water Boards and /or water service providers	√	√	X
6. Water services institutions	X	X	X
7. Catchment Management Agency	X	X	X
8. The local IDP drafting team or Local Municipality	√	X	X
9. Regional IDP drafting team or District Municipality	√	X	X
10. Neighbouring WSA's	√	X	X
11. Provincial departments (e.g. DLG&H)	√	X	X
12. Regional Office of DWAF	√	√	X
13. Council	√	√	X
14. Office of the Premier for the relevant Province			X
15. Minister for Provincial and Local Government			X
16. The Minister of Water Affairs and Forestry			X
17. Other (state as appropriate)			

1.6 Responsible Officials

In order to ensure that each component of the WSDP is adequately addressed and implemented, certain officials from the WSA were assigned to take responsibility for the different WSDP components, and are as follows :

Areas of expertise	Responsible official	Tel.	E-mail
1. Project manager	Mr M Ndokweni	042 288 0303	kareedouw@intekom.co.za
2. Workshop/participation Facilitator/ co-ordinator	Clrs E Mntambo / N O'Connell / J Yake	042 288 0303	kareedouw@intekom.co.za
3. Physical profile / GIS / maps	Mr T Mosia / D Cunningham	042 288 0303	kareedouw@intekom.co.za
4. Social profile / community liaison	Mr J Ruiters / Clr O'Connell	042 288 0303	kareedouw@intekom.co.za
5. Economic profile / business liaison	Mr N Oudshoorn / Mr TMöhr	042 288 0303	kareedouw@intekom.co.za
6. Domestic consumer profile	Mr N Oudshoorn / Mr T Möhr	042 288 0303	kareedouw@intekom.co.za
7. Industry consumers & water quality	Mr N Oudshoorn / Mr T Mosia	042 288 0303	kareedouw@intekom.co.za
8. Health education & liaison	Mr J Ruiters / Clr J Yake	042 288 0303	kareedouw@intekom.co.za
9. Water resources, conservation & demand	Mr T Mosia / Mr J Ruiters	042 288 0303	kareedouw@intekom.co.za

Areas of expertise	Responsible official	Tel.	E-mail
management			co.za
10. Water services infrastructure operation	Mr T Mosia / Mr T Möhr / Mr D Cunningham	042 288 0303	kareedouw@intekom.co.za
11. Water services system management	Mr T Mosia / Clr J Yake	042 288 0303	kareedouw@intekom.co.za
12. Environmental impact & legal Compliance	Mr J Ruiters / Mr T Möhr	042 288 0303	kareedouw@intekom.co.za
13. Institutional and management	Mr T Mosia / Council	042 288 0303	kareedouw@intekom.co.za
14. Finance	Mr N Oudshoom	042 288 0303	kareedouw@intekom.co.za
15. Strategic planning & analysis co-ordination	Mr T Mosia	042 288 0303	kareedouw@intekom.co.za
16. Inter-sectoral alignment and integration with IDP	Mr M Ndokweni / Mr T Mosia / Council	042 288 0303	kareedouw@intekom.co.za

1.7 Approval by Council

The Council must formally approve the WSDP. Councillors must be aware of the targets and funding commitments made in the WSDP since they will be responsible for ensuring that these commitments are fulfilled. The WSDP will also serve as a project management tool to monitor the achievement of these commitments.

Council Resolution			
Resolution No	Reference		Date

The Kou Kamma Municipal Council is committed to the delivery of adequate quality services to its community. In further compliance to the Water Services Act (Act 108 of 1997), Council is currently in process to appoint Consultants to assist them in the drafting of a Water Services Audit (gazetted in terms of Section 9(10) of the Water Services Act). An abstract of Section 9 of the Act is appended as Annexure D in this document. Funding for this project was already approved by the DBSA.

2. IDP AND WSDP GOALS

The new developmental role of local authorities holds the key to the development process of South Africa. In this process local government is a key role-player that should be empowered to unlock local delivery and development.

Empowering local government will require a major reconstruction and transformation effort. It will also require changes in the way local government thinks, behaves and organises itself. Developmental local government –

- actively promotes social and economic development in their areas;
- shapes their local spaces in a more equitable and efficient manner;
- plays a strong policy-making and strategic role;
- restructures itself to allow for both effective service delivery and greater community participation; and
- has the interest of the poor at the core of its mission.

The purpose of the IDP is to expedite and improve service delivery and to provide a framework for economic and social development in the Municipal area, and can be summarised as follows:

- Eradicating the development legacy of the past
- Making the notion of development Local Government work
- Fostering co-operative governance

The WSDP were prepared as part of the IDP process and forms a sectional plan that falls within the inter-sectional Umbrella plan of the development goals of the IDP.

This in essence becomes the overall framework within which detailed water services needs and development projects can be benchmarked and tested against.

2.1 IDP Vision

The Municipality's vision for the IDP is as follows:

“Kou Kamma is a vibrant and responsibly managed region, which is integrated, democratic and supported by a strong tourism base and a sustainable economy”.

Having this Vision as a focus point, the Kou Kamma Municipality had formulated a mission statement, which addresses the following:

- the purpose of the Municipality
- reflects the needs of it's citizens
- broadly indicates the products and services that will be delivered

The Mission statement adopted by the Municipality is as follows:

“To promote a well planned municipality, by which delivering access to sustainable services creates an environment in which all citizens can prosper through socio-societal upliftment and accountable corporate governance, (2003).”

2.2 IDP Priority issues and objectives related to Water Services

Government envisage eradicating the backlog in the provision of water services and sanitation in the previously disadvantaged communities by the year 2009. The WSDP was therefore compiled in order to achieve this goal. The WSDP is not only a legal requirement, it is also a useful tool towards achieving sustainable water services and sanitation. In addressing sustainable water services, there are three major issues that the WSA (Kou Kamma Municipality) should aim to achieve, ie. :

- Delivery sustainable water services
- Integrated water resource management
- Efficient and effective water services institutional arrangements (WSA capacity and WSP arrangements)

The following table indicates the priority issues highlighted in the IDP regarding water services :

IDP priority issues which impact on water services	IDP objectives related to water services
A large percentage of the population does not have access to water on site.	To provide drinking water of an acceptable quality to all areas in Kou Kamma.
A large percentage of households do not have access to sanitation services and many households still makes use of pit latrines and bucket systems.	To provide sanitation services in the urban areas to RDP levels (VIP) as a minimum service.

2.3 Sustainable water services sub-goals

The following table indicates the main- and sub goals envisaged by the WSA to ensure sustainable water services :

Main Goals	Sub-goals
Provision of basic water services (includes free basic water)	To provide standpipes as per RDP definition
Provision of basic sanitation services	To provide at least new VIP's
Higher levels of water services	To provide new water connections
Higher levels of sanitation services	To provide water borne sewer connections

2.4 Integrated water resource management sub-goals

The following table indicates the main goals and the appropriate measures to be taken by the WSA in order to ensure integrated water resource management.

Main Goals	Sub-goals
Water resource protection	Ongoing maintenance and upgrading of reticulation systems and bulk supply to minimise water losses.
Water resource conservation	Ensure that sufficient resources are available to meet the demand.
Demand management	Utilise existing resources efficiently and optimally. Utilise spare capacity.
Other (state)	None

2.5 Efficient and effective water services institutional arrangements sub-goals

In order for the WSA to achieve the above-mentioned goal, they envisaged the following measures :

	Sub-goals
Water services authority (WSA) overall capacity	To provide professional and ethical Human Resource staff Management and training for all personnel, address additional needs and to promote public participation and transparency
Water services provider (WSP) institutional arrangements	N/A

WSDP 1

KAREEDOUW

SECTION 3 - 8

WEDNESDAY

WEDNESDAY

WEDNESDAY

3. PHYSICAL AND SOCIO-ECONOMIC PROFILE

3.1 MAP – Current situation

3.1.1 Background

Refer to drawings 189610QO/02 and 189610QO/03.

Kareedouw is situated against the northern slopes of the Kareedouw Mountains in the Eastern Cape. It is approximately 145km to the west of Port Elizabeth along the N2 and R62 routes. The Krom River runs north of the town, the Assegaaibos Kloof stream east, and the Ouwerf Kloof stream to its west. Kareedouw, as former TLC, consists mainly of the following suburbs, viz.: Kareedouw Central, Uitkyk, Kagiso Heights, New Rest and Mountain View.

3.1.2 Water Supply Infrastructure

- **Primary Source : Assegaaibos Kloof Stream**

The Assegaaibos Kloof stream is perennial and it is the main source of water for Kareedouw. Water is drawn from the Assegaaibos Kloof at three positions. The first weir is below Derdebos, from where it gravitates in a 200 mm diameter pipe to the WTW south of the town. The water from the second and third draw-off points, below Eerstebos and a weir approximately 200 m downstream from Eerstebos respectively, is pumped to the 200 mm diameter pipe, from where it also gravitates to the WTW.

Delivery from the Assegaaibos Kloof during drought periods is approximately 1,5 l/s. Maximum delivery is approximately 20 l/s.

The pH of the Assegaaibos Kloof water is very low, the water is very soft and the iron content is reasonably high. As a result, the water is very corrosive and aggressive.

- **Secondary Source 1 : Boreholes**

The borehole field is situated to the south of the town. The water from one hole is pumped to the WTW.

The iron content of the borehole water is high and the pH low. The assured yield of the borehole is 2 l/s.

- **Secondary Source 2 : Dams on Drie Krone Farm**

In terms of an agreement between the Kareedouw TLC and the premier of the Eastern Cape, the farm known as Drie Krone, approximately 2 km west of Kareedouw, was bought and included as part of the commonage. The land will be used for community farming.

Three existing off-river storage earth dams are available on the farm. The water gravitates from a fountain in the mountains on the farm to the dams via an earth channel (± 4 km). The delivery during drought periods is approximately 3 l/s.

The capacities of the three dams are as follows:

Higher Lying Dam (Dam No 1):

Water volume	34 000 m ³
Dam wall volume	15 200 m ³
Dam wall height	7,5 m
Full Water Level (FWL)	347,5 msl

Lower Lying Dam (Dam No 2):

Water volume	27 300 m ³
Dam wall volume	23 400 m ³
Dam wall height	6 m
Full Water Level (FWL)	328 msl

Lower Lying Dam (Dam No 3) :

Water volume	11 200 m ³
Dam wall volume	8 100 m ³
Dam wall height	4 m
Full Water Level (FWL)	327 msl

Total Capacity of Existing dams **72 500 m³**

Water is pumped from Dam 1 to the inlet at the WTW in town at a rate of 7 l/s. The pumping main consists of a 3,5 km long 160 mm diameter uPVC pipeline.

This line can also serve as a gravity line to transfer excess water from Assegaaibos Kloof to be stored in the Drie Krone dams.

- **Reservoirs and Water Purification System**

Water is distributed to Kareedouw, Uitkyk, New Rest, Kagiso Heights and Mountain View from the 455 kl, 550 kl and 250 kl reservoirs and the 100 kl water pressure tank. The tank provides water at an increased pressure to high lying residential areas and the school hostel.

A water treatment works (WTW) with a capacity of 18 l/s (1 166 kl/day at 18 hrs/day) was commissioned during August 2001. The plant consists of an inlet division structure, a lime stabilisation tank, 4 sand filters and 3 sludge dams. Water is chlorinated at the entrance to the two main reservoirs. Due to the limited funding at the time, no settling tank and flocculation treatment were provided.

The total storage capacity for Kareedouw is as follows:

Treated water	
Concrete reservoir 1	550 kl
Concrete reservoir 2	455 kl
Water pressure tank	100 kl
Water pressure tank in Mountain View	<u>250 kl</u>
Total	1 355 kl

Raw water

Drie Krone Dam 1	34 000 kl
------------------------	-----------

No other storage facilities are available and the town is dependent on the capacity of the Assegaaibos Kloof stream, the Drie Krone fountain and the boreholes during low-flow periods (normally during March to June each year). Severe water restrictions have to be imposed during these low flow periods to ensure that limited potable water is available. During the rainy periods, large volumes of water however flow in both the Assegaaibos Kloof and Ouwerf Kloof streams past Kareedouw towards the Krom River and to the Churchill Dam (approximately 17 km from Kareedouw).

3.1.3 Sanitation

Refer to drawings 189610QO/02 and 189610QO/03 for Kareedouw's bulk sanitation infrastructure.

The level of service regarding sanitation for Kareedouw is also exceptionally high with 100% of all residential erven connected to a waterborne sewerage system, leading to the Waste Water Treatment Works.

Sewage is purified by means of the pond system. The ponds were emptied, desludged with plastic liners in 1999 under the supervision of Africon Consulting Engineers. The final effluent is sampled and tested at regular intervals and are being irrigated on an adjacent farm. The WWTW consists of the following components:

- Inlet Works
- Pond 1 (Anaerobic Pond) – 6 200 m³
- Pond 2 (Primary Pond) – 3 800 m³
- Pond 1 (Secondary Pond) – 9 950 m³
- Pond 1 (Tertiary Pond 1) – 3 950 m³
- Pond 1 (Tertiary Pond 2) – 1 470 m³
- Pond 1 (Irrigation Pond) – 2 700 m³

3.2 MAP- Future Situation

3.2.1 Water Services

Section 12, Table 1 summarises the new projects that need to be implemented additional to the existing infrastructure, in order to upgrade the water supply infrastructure of Kareedouw to an acceptable level.

3.2.2 Sanitation

Section 12, Table 2 summarises the new projects that need to be implemented additional to the existing infrastructure, in order to upgrade the sanitation infrastructure of Kareedouw to an acceptable level.

3.3 Physical Profile

The following table is a descriptive summary of the different attributes, which forms the physical profile of Kareedouw.

Description	No. of each type	Size	Unit of size	% of total municipal area	Indicate for any (Y/N)		
					Water resource impact	Water user	Waste water return
1. Residential settlements	6	168	Ha	80	√	√	x
2. Commercial areas	17	8.4	Ha	4	√	√	X
3. Police Stations	1	1.05	Ha	0.5	√	√	X
4. Magisterial Offices	0	0	-	-	-	-	-
5. Schools	3	12.6	Ha	6	√	√	X
6. Clinics	1	1.05	Ha	0.5	√	√	X
7. Hospitals	1	2.1	Ha	1	√	√	X
8. Prisons	0	0	-	-	-	-	-
9. Industries	3	6.3	Ha	3	√	√	X
10. Mining	1	2.1	Ha	1	√	√	X
11. Agriculture dryland	0	0	-	-	-	-	-
12. Agriculture irrigation	0	0	-	-	-	-	-
13. Agr. Intensive livestock	0	0	-	-	-	-	-
14. Agr. Extensive livestock	0	0	-	-	-	-	-
15. Resorts and tourism	0	0	-	-	-	-	-
16. Conservation areas	1	8.4	Ha	4	√	√	x

3.4 Topographical profile

The topographical profile for Kareedouw can be summarised as follows:

Topography type	Percentage of total municipal area
1. Mountainous	25%
2. Rolling	75%
3. Flat	-
4. Coastal	-

3.5 Current Consumer Profile

The entire municipal area of Kareedouw is classified as being urban. The following table summarises the different consumer profiles for Kareedouw:

	Urban	Dense	Village	Scattered	Farmland	Total
1. Total population	3297	-	-	-	-	3297
2. No. of household consumer units	1447	-	-	-	-	1447
3. No. of dry industrial consumer units	3	-	-	-	-	3
4. No. of wet industrial consumer units	0	-	-	-	-	0
5. No. of commercial consumer units	51	-	-	-	-	51
6. No. other Tourists	0	-	-	-	-	0

3.6 Present Population and Projected Population Growth Rates

According to officials at the Municipality the estimated population for the year 2002 is approximately 3 297 permanent residents. The population growth rate of $\pm 1,2\%$ used in the IDP was accepted for the purpose of the WSDP.

Projected population growth figures for the next 5 years will thus be as follows :

Settlement Type	No. of households	Current population	Effective population growth rate (1,2%/a)				
			Year 1	Year 2	Year 3	Year 4	Year 5
Urban	1447	3297	3337	3377	3417	3458	3500
Dense	-	-	-	-	-	-	-
Village	-	-	-	-	-	-	-
Farmland	-	-	-	-	-	-	-
Scattered	-	-	-	-	-	-	-
Total	1447	3297	3337	3377	3417	3458	3500

The effective population growth rate of 1,2% per annum is substantially lower than the historical growth rates due to the influence of the HIV/AIDS pandemic as well as economic and social development.

Calculations for effective population growth rate

The effective population growth rate will most likely change over the next 5 years considering the effect of economic development, social development (e.g. education) and the HIV/Aids pandemic.

The following table may assist planners in determining the effective growth rate considering the settlement type, social character and economic prospects in the following groupings. The "total" and "effective" growth rates will be calculated as a "weighted average" using either the number of settlements, number of households or the respective population.

Calculation sheet for effective population growth rate:

	Urban			Rural				Total
	Formal	In-formal	Total Urban	Dense	Village	Scatter	Farm-land	
1. Total population	3297	-	3297	-	-	-	-	3297
2. Annual population growth rate (natural)	1.4	-	1.4	-	-	-	-	1.4
3. Annual growth adjustment for HIV/AIDS	-0.2	-	-0.2	-	-	-	-	-0.2
4. Annual economic growth rate	1.0	-	1.0	-	-	-	-	1.0
5. Effective annual population growth rate	1.2	-	1.2	-	-	-	-	1.2

3.7 Demographic Trends and Migration Patterns

It is important to accommodate the dynamics of the demography in order to cater for effective service delivery during both peak and off-peak occasions. The following table summarises the demographic trends and migration patterns for Kareedouw.

Settlement Type	Permanent resident population	Peak daily labour migration (-) out / (+)in	Peak long-term labour migration (-)out / (+)in	Permanent population changes (-)out / (+)in	Holiday Population
Urban	3297	+60	+60	+60	60
Dense	-	+60	+60	+60	-
Village	-	+60	+60	+60	-
Farmland	-	+60	+60	+60	-
Scattered	-	+60	+60	+60	-
TOTAL	3297	+60	+60	+60	60

3.8 Age and Gender Profile

The age and gender profile of various communities may be indicative of the town's development needs and socio-economic status. The age and gender profile for Kareedouw, as obtained from their IDP, is summarised in the table below :

Settlement Type	Permanent resident population	Aged residents (>65yrs)	Youth residents (<18yrs)	Male residents	Female residents
Urban	3297	193	1150	1594	1703
Dense	-	-	-	-	-
Village	-	-	-	-	-
Farmland	-	-	-	-	-
Scattered	-	-	-	-	-
TOTAL	3297	193	1150	1594	1703

3.9 Health profile

The quality of water for domestic usage in Kareedouw is of a very high quality and conforms to the conditions of the SABS 241. Water gets sampled, tested and monitored by SAIMR of Port Elizabeth on a monthly basis. The occurrence of water related diseases are thus zero and no records of previous incidents exist. The following table summarises the health profile for Kareedouw :

Area	Time frame	Total consumers	Number of consumers affected by							
			Water related disease			Skin effects	Teeth effects	Taste effects	Pipe corrosion	Water colour
			Diarrhoea	Cholera	Bilharzia					
1. Urban		3 297	0	0	0	0	0	0	0	0
2. Rural	-	-	-	-	-	-	-	-	-	-
3. Total		3 297	0	0	0	0	0	0	0	0

3.10 Employment profile

The status and type of employment indicates the nature of household income and income security. It also indicates the ability of the community to pay for services rendered. It can also be useful tool which the Municipality can use to plan or provide for adequate resources to attend to cost recovery measures. The following table summarises the employment profile for Kareedouw.

Settlement type	Eligible work force (18 -65yrs)	Permanent residents -without jobs	Seasonal farm workers	Temp'ry domestic workers	Perm. farm workers	Perm. Industry workers	Profes-sional workers
1. Urban	1 954	142	68	19	101	939	376
2. Dense	-	-	-	-	-	-	-
3. Village	-	-	-	-	-	-	-
4. Farmland	-	-	-	-	-	-	-
5. Scattered	-	-	-	-	-	-	-
6. TOTAL	1 954	142	68	19	101	939	376

3.11 Household Income

A key constraint in planning for infrastructure delivery is household affordability. Knowing the existing situation regarding household incomes is a key part to understanding consumers' affordability levels. These levels should be taken into account when setting service level targets.

The key element of the WSDP is the assessment of affordability of the service to consumers. In order to adequately understand affordability, typical monthly bills need to be assessed against what people are earning. This needs to be looked at in terms of how the Equitable Share will be allocated and what the indigents policy of the municipality is. It should be noted that the overall total municipal bill which includes all municipal services and rates (i.e. not just water and sanitation) for low income earners should not be greater than about 10 percent of income. The table below should be included in order to understand whether consumer's bills are affordable or not. Only households earning less than R1500 need be reported on, as this is where affordability constraints are most likely to occur.

Settlement type	Number of households with monthly income of:					Affordability			
	< R800	R800 to R1500	R1500 to R2500	R2500 to R3500	> R3500	Water		Sanitation	
						Typical monthly Bill	Avg % of monthly income	Typical Monthly Bill	Avg % of Monthly Income
1. Urban	586	310	216	100	235	21-93	1,5%	41-22	2,5%
2. Dense	-	-	-	-	-	-	-	-	-
3. Village	-	-	-	-	-	-	-	-	-
4. Farmland	-	-	-	-	-	-	-	-	-
5. Scattered	-	-	-	-	-	-	-	-	-
6. TOTAL	586	310	216	100	235	21-93	1,5%	41-22	2,5%

3.12 Poor household definition

Households earning less than R1500 jointly.

3.13 Economic Sectors, GGP contribution and employment

The economic profile of a WSA/Municipality's region is directly related to the development prospects, affordability of services and projected water use. It was therefore deemed important to assess the overall economic situation and development prospects before determining specific water services development actions.

Well-defined distribution figures of the different economic sectors attributing to the GGP were not available, for Kareedouw as an individual town. Attributes to the GGP for the entire Kou Kamma Municipality were therefore considered, since daily labour migrations is common practice in the area.

The following table described the sector contributions to the gross geographic product (GPP) and the relating employment figures.

Economic sector	Total no. of employees	No. of local employees	No. of migrating labour	% contribution to local GPP
Farming	225	216	9	T.B.D.
Mining	3	3	0	T.B.D.
Manufacturing	50	48	2	T.B.D.
Utilities	7	7	0	T.B.D.
Construction	24	23	1	T.B.D.
Trade	26	25	1	T.B.D.
Transport	19	18	1	T.B.D.
Business Services	7	6	0	T.B.D.
Social Services	51	49	2	T.B.D.
Private Household	45	43	2	T.B.D.
Exterritorial	0	0	0	T.B.D.
Diplomatic	0	0	0	T.B.D.
National Executive Council	41	40	2	T.B.D.
N/A	979	941	39	T.B.D.
Institution	38	37	2	T.B.D.
TOTAL	1515	1455	60	T.B.D.

3.14 Economic trends

Various economic development initiatives, land reform, poverty relief and other socio-economic restructuring programs are being implemented in the Kou Kamma Municipal area. Although results are deemed to be positive to economic growth, the effect on past and future regional economic trends could not be quantified accurately at this point in time since some negotiations are still at an early stage.

The IDP however, highlighted the following points of concern, which puts a direct strain on economic growth in the region :

- unemployment, poverty and lack of job opportunities
- population growth and urbanisation
- lack of adequate funds
- slow delivery process due to slow administration process
- lack of skills and capacity of communities and beneficiaries
- land availability and ownership
- lack of clear planning guidelines and policies relating to housing
- slow release of Government subsidies for subsidised housing

Although the effect of economic change is primarily based on the population growth rate (migrations), which in return should affect the level of income and affordability for higher levels of service, the Municipality and other stakeholders should take serious cognisance of the abovementioned constraints.

4. SERVICE LEVEL PROFILE

Having an understanding of the current situation allows the most important aspect of the plan to be addressed: service level targets. This section sets out what services will be provided to consumers; both in terms of *level of service* and *quality of service*. Before going into the tables themselves, some explanatory text is given dealing with types of services and the importance of formulating a service level policy.

The vision and mission of the IDP should drive this part of the planning process. For example, the vision of the IDP could be, amongst other things, to ensure that all citizens have access to at least a basic level of service within five years.

The targets set in this section must be compatible with the IDP.

The proposed programme, as defined by the service level and service quality goals, can only be done with reference to the full integrated planning process, considering socio-economic, water resource, environmental, infrastructure, management and financial constraints. This implies that a number of scenarios will have to be tested before the most appropriate one can be decided upon.

Types of services

The concept of service levels relates to the options which consumers can be given with regard to the convenience of the service and hence the amount of water, which they will consume, and the associated wastewater they will generate.

There are ranges of different service types, which can be provided. These are clarified below according to the types reported in the tables.

None or inadequate

This refers to the number of consumer units (or households) that do not have access to basic water supply or sanitation.

Basic water supply comprises:

- a) the provision of appropriate education in respect of effective water use; and
- b) a minimum quantity of potable water of 25 litres per person per day –
 - at a minimum flow rate of not less than 10 litres per minute;
 - within 200 metres of a household; and
 - with an effectiveness of not more than 7 days interruption supply to any consumer per year.

Basic sanitation comprises:

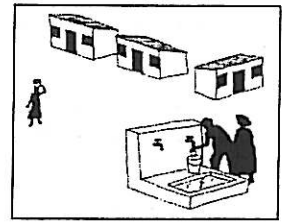
- a) the provision of appropriate health and hygiene education; and
- b) a toilet which is safe, reliable, environmentally sound, easy to keep clean, provides privacy and protection against the weather, well ventilated, keeps smells to a minimum and prevents the entry and exit of flies and other disease- carrying pests.

(Source: Compulsory national standards in terms of Sections 9(1) and measures to conserve water in terms of 73(1)(j) of the Water Services Act.)

Water service levels

Communal water supply

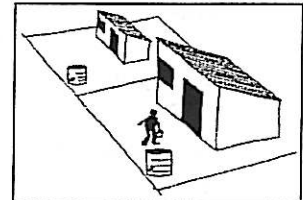
See 'basic water supply' explained above.



Controlled volume supply

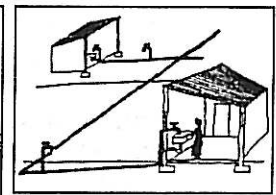
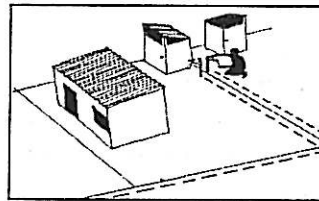
E.g. Yard Tanks

Each house is provided with a tank, which holds about 200 litres. The tank gets filled up once a day. This type of service is often referred to as an intermediate level of supply.



Uncontrolled volume supply

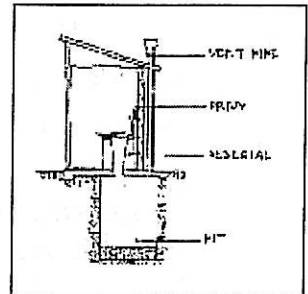
There are generally two types: either the tap stands outside the house on its own or on the wall of an outside toilet (yard tap) or water is piped into the house to take water to taps in the kitchen, bathroom, toilet etc.



Sanitation

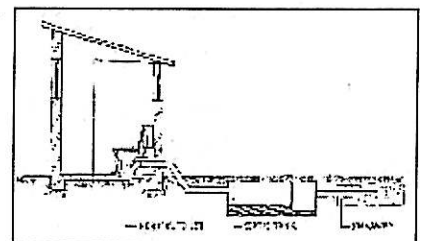
Consumer installations: Dry

See basic sanitation supply explained above. The latrine has a lined pit with a concrete slab over it. An air vent allows smells out into the air above the privy.



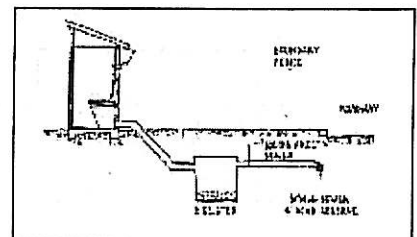
Consumer installations: Wet (septic tanks)

Water is flushed into a digester where certain bacteria live. Digester effluent flows into the soak away, then the ground. The digester has to be pumped out occasionally.

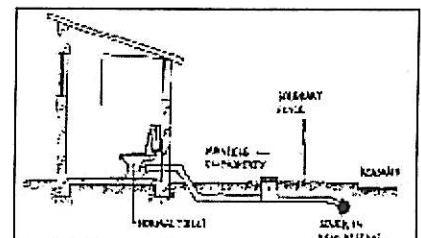


Discharge to wastewater treatment works

Here there are generally two types: intermediate (e.g. aqua privy with solids free sewer which is similar to a septic tank, but instead of a soak away the digester effluent flows into a pipe which connects to a small sewer in the road reserve).



Full waterborne refers to the situation where a flushing toilet is used; the wastewater flows to a sewer on the site, then to sewers on the street. From there it flows to a treatment works to be cleaned, and then into a river.



Service level policy

Of crucial importance in planning for the future is for the WSA to have a service level policy. This involves identifying the different levels of service that will be offered by the WSA and highlighting what the capital and operating cost implications of each level will be. This policy might include what level of service can be provided free of charge versus what levels consumers will be expected to pay for. It is essential that a policy of this nature be in place before targets can be finalised.

The key issue in preparing a service level policy is that higher than basic services should be provided only where households can afford these levels of service, due to the necessity of recovering the increased capital and operating and maintenance costs. While politically difficult, this is likely to be the only way in which sustainable services can be provided in the long term. There are numerous examples of unaffordable service levels being provided with catastrophic results for both households and municipalities.

Finalising a service level policy and setting targets must be done in consultation with the public.

“Community members are very capable of making sound choices in terms of technology and costs of services, if given the right information and involved fully in planning. Community participation is the best way to obtain support and involvement by the beneficiaries leading to acceptance of projects and promoting ownership. The results are often reaped in reduced management and operation costs by the implementing authority and benefits to the community (NASCO, 2000).

Key issues to take into account when formulating a service level policy

The following should be taken into account when formulating a service level policy:

- The types of service levels decided upon have a major impact on capital and operating costs and hence on the long-term viability of service provision. If service levels are set too high the consumers who receive them will not be able to afford to pay for them and are likely to default on their payments, which will in turn, impact on the viability of the service provider.
- Service levels relate to the quantity of water used and thus there is an impact on the environment from which this water has to be abstracted and returned to.
- Risks of pollution associated with the various levels of services must be considered. Higher levels of service have higher risk of pollution.
- The size and density of the settlement should be taken into account when deciding levels of service. In general large settlements produce more waste and hence higher risks of pollution while pollution from smaller settlements is easier to manage.

Existing service levels

Having an understanding of the types of services available, the WSA should assign existing services to these different levels and report the figures in the current columns of the tables. Considerable work will need to be done in integrating information from the different areas that comprise the new water services authorities.

Service level targets

Service level targets (set within the constraints of the service level policy) can be set as follows:

- a) **New consumer units** - This refers to new units that will need to be provided as a result of natural population increase or migration to the area.
- b) **Current backlogs** - This refers to those households that are currently not adequately served, for example those having a supply less than RDP standards.
- c) **Upgrading** - This refers to those households who currently have adequate services but who are to be upgraded to a higher level.

The figures need to be consolidated and translated into targets per year for the number of consumer units, which will have access to each level of service category and recorded in the tables in Table 4.1.

If for any reason basic services cannot be extended to all consumer units within 5 years, reasons need to be stated in the text as to why this is so.

Service level coverage – “quantity”

The current situation needs to be completed for the settlement types i.e. urban and rural (dense, village, scattered and farmland) and consolidated according to the tables below. Separate tables are given for each category of user. Once the scenario has been chosen, the targets need to be reported in the columns from year 1 to year 5. By year 5, there should be no consumer units that have a level of supply that is “none or inadequate”. If this cannot be achieved, reasons for this must be stated in the text.

4.1 Residential consumer units for water

All residential and non-residential erven in the Kareedouw area are considered to be in an urban context. All subheadings relating to rural erven as prescribed in the Guidelines for WSDP will thus be ignored since it is of little or no significance.

All the consumers in Kareedouw have access to at least a basic level of service regarding water and sanitation.

The following tables summarises the residential consumer units for water services and sanitation currently and the projection for the next 5 years :

No. consumer units with:	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. None or inadequate	-	-	-	-	-	-	-
2. Communal water supply	-	-	-	-	-	-	-
3. Controlled volume supply	-	-	-	-	-	-	-
4. Uncontrolled volume supply: yard tap or house connection	1000	1447	1447	1447	1447	1447	1447
5. Total served (2+3+4)	1000	1447	1447	1447	1447	1447	1447
6. Total (1 + 5)	1000	1447	1447	1447	1447	1447	1447

4.2 Residential consumer units for water: rural: dense

There are no records to report at this stage for this sub-section

4.3 Residential consumer units for water: rural: village

There are no records to report at this stage for this sub-section

4.4 Residential consumer units for water: rural: scattered

There are no records to report at this stage for this sub-section

4.5 Residential consumer units for water: rural: farmland

There are no records to report at this stage for this sub-section

4.6 Residential consumer units for sanitation: urban

No. consumer units with access to sanitation facilities:	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. None or inadequate: Below RDP: Pit	-	-	-	-	-	-	-
2. None or inadequate: Below RDP: Bucket	-	-	-	-	-	-	-
3. Consumer installations: On site dry or equivalent	-	-	-	-	-	-	-
4. Consumer installations: Wet (septic tanks, digester or tanker desludge etc.)	-	-	-	-	-	-	-
5. Discharge to water treatment works (intermediate or full waterborne)	1000	1447	1447	1447	1447	1447	1447
6. Total served (2+3+4+5)	1000	1447	1447	1447	1447	1447	1447
7. Total (1+6)	1000	1447	1447	1447	1447	1447	1447

4.7 Residential consumer units for sanitation: rural: dense

There are no records to report at this stage for this sub-section

4.8 Residential consumer units for sanitation: rural: village

There are no records to report at this stage for this sub-section

4.9 Residential consumer units for sanitation: rural: scattered

There are no records to report at this stage for this sub-section

4.10 Residential consumer units for sanitation: rural: farmland

There are no records to report at this stage for this sub-section

4.11 Public Institutions and Dry Industries

The following table summarises the previous, current and projected future non-residential consumers which also impacts on water services and sanitation of Kareedouw:

Public amenities Consumer types	Time frame	No. of consumer units	No. of consumer units with access to:			
			None or inadequate	Communal supply	Controlled volume supply	Uncontrolled volume supply
Police stations	Prior 1	1	-	-	-	√
	Current	1	-	-	-	√
	5 years	1	-	-	-	√
Magistrate offices	Prior 1	0	-	-	-	√
	Current	0	-	-	-	√
	5 years	1	-	-	-	√
Businesses	Prior 1	26	-	-	-	√
	Current	27	-	-	-	√
	5 years	35	-	-	-	√
"Dry" industries	Prior 1	25	-	-	-	√
	Current	25	-	-	-	√
	5 years	30	-	-	-	√
Office buildings	Prior 1	2	-	-	-	√
	Current	2	-	-	-	√
	5 years	4	-	-	-	√
Garages	Prior 1	2	-	-	-	√
	Current	2	-	-	-	√
	5 years	3	-	-	-	√
Prisons	Prior 1	0	-	-	-	√
	Current	0	-	-	-	√
	5 years	0	-	-	-	√
Schools	Prior 1	3	-	-	-	√
	Current	3	-	-	-	√
	5 years	3	-	-	-	√
Hospitals	Prior 1	1	-	-	-	√
	Current	1	-	-	-	√
	5 years	1	-	-	-	√
Clinics	Prior 1	1	-	-	-	√
	Current	1	-	-	-	√
	5 years	1	-	-	-	√
Crèches	Prior 1	4	-	-	-	√
	Current	4	-	-	-	√
	5 years	5	-	-	-	√
Other (School Hostel)	Prior 1	1	-	-	-	√
	Current	1	-	-	-	√
	5 years	1	-	-	-	√
Total	Prior 1	66	-	-	-	√
	Current	67	-	-	-	√
	5 years	85	-	-	-	√

4.12 Public institutions and 'dry' industries: rural

There are no records to report at this stage for this sub-section

4.13 Wet Industries

No wet industries currently exist in Kareedouw and the Municipality is foreseeing none over next 5 year window frame.

4.14 "Raw" water Consumers

No raw water consumers currently exist in Kareedouw and the Municipality is foreseeing none over next 5 year window frame.

4.15 Industrial Consumer Units for sanitation

Industrial consumers typically discharges directly to treatment works and do not have intermediate options as is the case for residential consumers. No significant Industrial consumer currently exists in Kareedouw and the Municipality is foreseeing none over next 5 year window frame.

No industries therefore need to permit effluent releases.

4.16 Industries and their permitted effluent releases

There are no records to report at this stage for this sub-section.

5. WATER RESOURCE PROFILE

This section is closely related to the water balance, but where the balance deals with total amounts, this section deals with the conditions associated with use, both in terms of quantity and quality. The total water required as identified in the water balance based on the service level targets needs to be compared to permitted abstraction and return rights as stipulated in the permits. There is therefore some overlap in reporting requirements.

This part of the WSDP is driven by the National Water Act (Act 36 of 1998) and therefore will require dialogue with the Catchment Management Agency (CMA) [or DWAF Regional Office until the CMA is established] and reference to the Catchment Management Strategy/ies (CMS) when these are in place. It is very important that water demand and wastewater flows within the Catchment be viewed against what the resources can sustainably supply and what the likely environmental impacts will be.

Permits govern abstraction and return rights within a Catchment. The additional flows that might arise from the service level targets may well result in requirements over and above what is stated in the permit. The WSA needs to understand what these are and the implications for permits.

It is important to note that all water used within the WSA area needs to be included, including those resources not managed by the authority (such as boreholes and those operated by other water services providers).

The reporting format in this section does not require a separation into urban and rural areas.

Water Source

With the annual water demand and wastewater flows known, the capacity of sources to meet this demand needs to be assessed.

In the case where boreholes are operated independently and water used for human consumption, the WSA should report on these as well.

Water abstracted from sources

Reporting requirements in this section refer to water supplied through the municipal system. This includes borehole water supplied for human consumption. Water abstracted from sources needs to be reported in terms of all providers extracting water. There are three main sources of water:

- abstraction from surface sources within the WSA area of jurisdiction (dams, springs, large rainwater collectors such as natural rock surfaces or streams);
- abstraction from groundwater sources within the WSA area of jurisdiction (boreholes or dug wells);
- purchase from external sources (e.g. a water board).

5.1 Surface Water Sources

See paragraph 3.1.2

5.2 Groundwater Sources

See paragraph 3.1.2

5.2.1 Groundwater monitoring

	Yes	No
1. Are groundwater levels regularly monitored?	√	
2. Is the groundwater monitoring data regularly processed and reported on by a qualified hydro-geologist?	√	
3. Is ground water quality monitored and reported on?	√	

5.3 External sources (where the WSA purchases water from others)

No water is being purchased from others.

5.4 Water returned to resources

No water is being directly returned to resources.

5.5 Quality of water taken from source : urban

The following table comments and summarises the quality of water taken from the source :

	At source	At reservoir	At tap
Is water quality measured? (yes/no)	no	yes	no
1. Do you monitor it yourself? (yes/no)	no	yes	no
2. If no, who does?	no	KKM & NMMM	no
3. Monitoring intervals (daily, weekly, monthly, quarterly, bi-annually, annually)	no	Daily & Annually	no
4. Are these results available in electronic format? (yes/no)	no	Yes(annually)	no
5. % time (days) within SABS 241 standards per year	no	95%	no

5.6 Quality of water taken from source : rural

There are no records to report at this stage for this sub-section

5.7 Reporting on quality of water taken from source : Urban and Rural

	Yes/ No	Method of notification
If quality of water taken from source does not comply, are urban residents notified?	No	NA
If quality of water taken from source does not comply, are rural residents notified?	No	NA

5.8 Quality of water returned to the resource: urban

Quality of water returned to the resource is increasingly becoming an issue in South Africa. Water quality is regulated according to permits, licenses and standards and it is very important that these be put in place if not already effective.

The water returned to the resource may be from either point sources e.g. wastewater treatment works, the quality of which will be measurable, or diffuse sources e.g. grey water from informal settlements the quality of which will be less easy to measure.

Once again, urban areas are likely to have more established monitoring arrangements and for this reason the distinction is made between urban and rural areas. Different types of pollution need to be dealt with in this section, both from "point" (e.g. an industry) and "diffuse" (e.g. an informal settlement or agricultural holding) sources.

Point source pollution

Point sources refer to discharges from identifiable users at a point (generally a pipe discharging to a stream). Often this is associated with industries but also includes wastewater treatment works that may discharge water containing waste back to a resource. For industries not discharging directly to a resource but to the sewer, the WSA needs to monitor the types of chemicals being disposed of and that these are disposed of to the wastewater treatment works within the parameters laid down in bylaws. In this way, the effluent can be treated effectively with no adverse effects on the wastewater treatment works' operation. If these sources are polluting directly to a resource because of, for example, poor stormwater management, steps need to be taken to ensure that these flows are directed through treatment works. It is therefore important for the WSA to monitor the types of effluent being disposed of into the sewers as well as the discharges from the wastewater treatment works itself.

Diffuse source pollution

Diffuse sources of pollution refers to a number of cases where polluted water is returned to the resource (both surface and groundwater) without being treated. This mainly occurs when:

- There are no, or poorly managed stormwater systems which results in run-off and pollution of water sources.
- There are poorly operated and maintained sanitation facilities eg. blocked sewers, pump failures etc. leading to sewage leaks and pollution of water resources.
- There is runoff from informal settlements (e.g. where standpipes are poorly designed with no drainage system).
- There are inadequate sewage works.
- Sludge from pit latrines is not disposed of adequately. To avoid this, the use of double pits could be explored.
- There is runoff from solid waste sites (e.g. where no leachate collection system exists).
- There is run-off from agricultural areas e.g. feedlots, cultivated lands.

The most urgent task to be undertaken is for the WSA to find out where there are problems and prioritise those areas that represent the greatest threat to water quality.

The WSA needs to address the above (i.e. both point and diffuse sources of pollution), but for Edition 2001, the following must be reported.

5.9 Quality of water returned to the resource: urban

	In the return effluent	In the stormwater	In the river
1. Is water quality measured? (yes/no)	√	X	X
2. Do you monitor it yourself? (yes/no)	√	X	X
3. If no, who does?	NMMM	X	X
4. Monitoring intervals (weekly, monthly, quarterly, bi-annually, annually)	quarterly	X	X
5. Are these results available in electronic format?	No	X	X
6. For wastewater treatment works discharges to water resource: % time within requirements of special or general standards (Regulation 991).	99%		

5.10 Quality of water returned to the resource: rural

There are no records to report at this stage for this sub-section.

5.11 Pollution contingency measures

No pollution contingency measures are in place in Kareedouw since no pollution occurs or has previously been recorded.

6 WATER CONSERVATION / DEMAND MANAGEMENT (WC/WDM)

Water Conservation can be defined as the minimisation of loss or waste, the care and protection of water resources and the efficient and effective use of water.

Water Demand Management can be defined as the adaptation and implementation of a strategy by a water institution or consumer to influence the water demand and usage of water in order to meet any of the following objectives: economic efficiency, social development, social equity, environmental protection, sustainability of water supply and services, and political acceptability.

Promoting the efficient use of water should be a driver of the WSDP process, particularly since South Africa is a water scarce country. Water required as a result of the service level targets may exceed water available. There are two options in this case, either build new infrastructure (which is very costly), or institute a WC/WDM strategy, or a combination of the two. The need to implement WC/WDM is not limited to water resource requirements. The implementation of WC/WDM can have a significant impact in ensuring effective, affordable and sustainable water services with social, economic and environmental benefits.

The potential benefits of this approach for the country as a whole are significant as indicated in the box below.

"It is estimated that the potential economic benefit of WC/WDM over the next fifteen years in the water services sector in South Africa is approximately R50 billion. This could be achieved through cost savings in postponing capital infrastructure and in operating costs."

"... it is calculated that the total opportunity in reducing water demand in the water services sector in South Africa is approximately 39 percent of the total existing demand"

(Source: Water Conservation and Water Demand Management Strategy for the Water Services Sector, 2000)

The total figures for water balance can only be calculated once WC/WDM has been conducted for the area.

WC/WDM Strategy

The National Water Audit (Section 2 (h) (iii)) requires WSAs to prepare WC/WDM strategies in order to achieve more efficient use of water. The Directorate Water Conservation has prepared comprehensive guidelines in this regard, including a model strategy for water services authorities. A model strategy has also been developed for regional water services institutions such as water boards and metropolitan councils that have bulk water supply functions. The WC/WDM strategy for WSAs also needs to form part of the regional WC/WDM strategy. It is important to recognise that although WSAs are ultimately at the interface of WC/WDM initiatives the needs and objectives of the strategy need to be looked at from various perspectives including consumers, municipalities, bulk suppliers, catchment management agencies and the national perspective.

"The purpose of the WC/WDM model strategies is to enhance the management of water services in order to achieve sustainable, efficient and 100 percent affordable services to all consumers. The aim of the model strategies is to influence all functions and business plans related to water services. The emphasis of the model strategies is to influence water services to incorporate social, environmental, economic and technical considerations."

Source: Water Conservation and Water Demand Management Strategy for the Water Services Sector, 2000)

These guidelines include a very useful overview of how such strategies can be applied within the different areas that comprise new municipalities.

The model strategy comprises a number of elements. WSAs are then encouraged to use the elements to develop their own detailed strategies, which should identify appropriate actions and business plans to meet the stated objectives and goals. The focus of the model strategy is for a medium to large size WSA. Smaller WSAs are encouraged to implement as many aspects of the strategy that are feasible.

Many of the elements of such a strategy are part of the WSDP requirements. However, particularly the larger, more capacitated WSAs are encouraged to produce specific strategies based on the above mentioned model strategy. Should this be the case, the WSA should attach their strategy to their WSDP submission.

There are a host of activities that a WSA could embark upon to ensure more efficient use of water. These can be classified according to the following four categories:

- Water resource management
- Distribution management
- Consumer/end user demand management
- Effluent/return flow management

The implementation of a WC/WDM strategy does not only refer to measures that reduce water wastage and inefficient use but also include measures to effectively manage and sustain efficiency targets. Some of the priority requirements are to install systems that measure and identify certain key parameters such as minimum night flows and systems to enable detailed and regular water audits and water balances.

Depending on the circumstances, the initial focus of reducing demand could be the reduction in unaccounted for water (UAW) and a reduction on the wastage and inefficient use of non revenue water consumption (i.e. the reduction of involuntary water usage by non-paying consumers). However, this does not mean that WSAs should not target paying consumers and WSAs should also consider implementing other activities to reduce water consumption. Some of the activities that a WSA should implement include quantifying the exact potential through pilot projects and through further research. Pilot projects should include retro-fitting of plumbing fittings, rain water harvesting, retro-fit water saving devices and the use of indigenous plants. A communication and awareness campaign needs to be an integral and sustainable intervention of any WC/WDM strategy.

Water resource management interventions

Water resource management interventions should be dealt with in supporting text and should deal with interventions such as the removal of invading plants, recharge of aquifers, rehabilitation of wetlands and clean up campaigns of rivers.

Targets for reducing unaccounted for water and water inefficiencies

Total figures for unaccounted for water (UAW) are reported as part of the water balance, however activities to reduce unaccounted for water and water inefficiencies are unpacked in this section.

Unaccounted for water is defined as the difference between the measured volumes of water put into the supply system and the total volume of water measured to authorised consumers.

Internal plumbing leaks are leaks past the consumer meter. Such leaks can be assessed through sample surveys of consumer households and by analysing the minimum night flow of bulk meters.

6.4 Reducing high pressures for residential consumers : Rural

There are no records to report at this stage.

Consumer/end-use demand management

There are a number of ways of ensuring the reduction of water demand by consumers. These can generally be divided into two categories. The first is to influence the behaviour of consumers and the second is through the implementation of assistance projects.

Assistance projects are interventions of best management practices, which are funded or partially funded by WSAs. Examples include projects to repair plumbing leaks, to retrofit dual-flush toilets, installation of dual water distribution systems (i.e. the use of readily available saline groundwater for the flushing of toilets and treated potable water for drinking and other purposes) and to replace exotic gardens with alternative waterwise gardens. More efficient use can also be made through recycling of water. This can be to different standards depending on what it will be used for. For example, consumers can be encouraged to use grey water, i.e. bath, shower, etc. for watering of their gardens.

One of the key elements of a sustainable WC/WDM strategy is to develop and promote activities that are also beneficial to consumers. WSAs are encouraged to adopt a "win-win" approach and not introduce punitive measures unless they have to. One of the most effective ways to encourage consumers to use water more efficiently is through tariff mechanisms.

Influencing consumer behaviour

Public information and school education programmes are key to highlighting the need and benefits of initiating WDM/WC strategies. These programmes could include brochures, paid advertising, newsletters or magazine inserts, demonstrations, exhibits, internet web pages, informative billing, and demonstration gardens.

For DWAF's monitoring role, WSAs should report the information in the tables that follow.

6.5 Consumer/end-use demand management: public information and education programmes

The Municipality does not have an individual public information and education program for water conservation in place en depend mainly on Government programs and initiatives to get the message across.

6.6 Leak and meter repair programmes

Assistance programmes

WSAs should prioritise assistance programmes in the former "urban black townships". Such assistance programmes should include a number of measures that will ensure efficient water usage and build trust between the consumer and the WSA. Houses in these townships previously belonged to the municipalities and were not adequately maintained often resulting in significant plumbing leaks.

The Municipality plan to develop a Water Management Policy that will be specifically aimed at reducing the volume of unaccounted for Water and encouraging consumers to apply more effective and efficient use of water. Leaflets of the Policy will be sent out with each Municipal bill.

7. WATER SERVICES INFRASTRUCTURE PROFILE

7.1 Existing Infrastructure

See paragraph 3.1

7.2 Brief functional description of existing main infrastructure

See paragraph 3.1

7.3 Existing groundwater infrastructure

General information	BH1	BH2	BH3
Component name	1		
Component ID	KW1-KW4		
Scheme name	Borehole field		
Institutional status			
Current owner	Mun		
Current operator	Mun		
Future owner / WSA (If applicable)	Mun		
Future operator / WSP (If applicable)	Mun		
Asset assessment			
Date constructed	1983		
Expected total lifespan	T.B .D		
Estimated replacement value	600,000		
Annual operating cost			
Annual maintenance cost			
Type & capacity			
Depth	+/-200m		
Delivery capacity (m ³ /day)	86,4		
Power source (solar, electricity, engine, hand, other – please state)	electricity		
Type of superstructure (concrete, brick, structural steel, other – please state)	brick		
How much capacity is still available for development? (%)	none		
Operation			
How often is groundwater quality tested? (Daily, weekly, monthly, annual, never)	monthly		
How often is groundwater depth measured (Daily, weekly, monthly, annual, never)	monthly		
Is borehole yield monitored? (Yes/No)	Yes		
Is abstraction recorded? (Yes/No)	Yes		
Is the abstraction registered with DWAF? (Yes/No)	Yes		
Previous vandalism or theft (Security problem) (Yes/No)	No		
Functionality			
Describe the physical condition (in operation/poor/good)	In operation		
How well is the infrastructure maintained? (none, infrequent, demand, planned)	Demand		
Are spare parts readily available? (Yes/No)	Yes		
Number of breakages / failures per year	varies		
What needs to be refurbished? (cost)	-		
What needs to be replaced? (cost)	-		

7.4 Existing surface water infrastructure

No surface water infrastructure exists.

7.5 Existing water treatment works infrastructure

The following table summarises the existing water treatment works infrastructure as described in paragraph 7.1 :

General information	WTW1
Component name	Kareedouw
Component ID	WTW 1
Scheme name	
Institutional status	
Current owner	Mun
Current operator	Mun
Future owner / WSA (If applicable)	Mun
Future operator / WSP (If applicable)	Mun
Asset assessment	
Date constructed	2001
Expected total lifespan	30yr
Estimated replacement value	2,5mil
Annual operating cost	R23 968
Annual maintenance cost	R15 978
Type & capacity	
Type of plant (description)	Lime stabilisation, filters
Water source (purchased, ground, surface)	Ground & Surface
Physical water quality: Turbidity	
Chemical causing quality problem (>10 mg/l)	None
Chemical causing quality problem (>10 mg/l)	None
Chemical causing quality problem (>10 mg/l)	None
Chemical causing quality problem (>10 mg/l)	None
Design Capacity (Mℓ/day)	1,166
How much capacity is still available for development? (%)	56%
Operation	
Total volume of water treated per year (Mℓ)	425,6
Operating hours per day	18hrs
How often is water quality monitored? (daily, weekly, monthly, annual, never)	Monthly
What laboratory is used?	
% Of the time that water is chlorinated	100%
% Of water lost through process (eg. Waste water)	5%
Functionality	
Describe the physical condition (in operation, poor, good)	Good
How well is the infrastructure maintained? (none, infrequent, demand, planned)	Planned
Are spare parts readily available? (Yes/No)	Yes
Number of breakages / failures per year	2
What needs to be refurbished? (cost)	-
What needs to be replaced? (cost)	-

7.6 Existing pump stations infrastructure

Kareedouw's water supply scheme operates mainly on the gravity principle. No information regarding the pumps at the water tower in Ashton Bay was available at this point in time.

7.7 Existing bulk pipeline infrastructure

The following table summarises the existing bulk pipeline infrastructure as described in paragraph 7.1 :

General information	Zone 1	Zone 2	Zone 3
Component name	Drie Krone pipeline	Assegaaibos kloof stream	Borehole cluster
Component ID	Zone 1	Zone 2	Zone 3
Scheme name	Drie Krone	Assegaaibos	Mountain view Borehole
Institutional status			
Current owner	Mun	Mun	Mun
Current operator	Mun	Mun	Mun
Future owner / WSA (If applicable)	Mun	Mun	Mun
Future operator / WSP (If applicable)	Mun	Mun	Mun
Asset assessment			
Date constructed	Unknown	Unknown	Unknown
Expected total lifespan	30 yrs	30 yrs	30 yrs
Estimated replacement value	900 000	650 000	250 000
Annual operating cost	5 000	5 000	2 000
Annual maintenance cost	5 000	5 000	2 000
Type & capacity			
Pipe material (Most common)	uPVC	Unknown	uPVC
Avg. Diameter (mm)	160	200	90
Avg. Pipe Class	9	6	9
Avg. Discharge rate (ℓ/s)	7	8	2
Total Length above ground (m)	-	-	-
Total Length below ground (m)	3 340	2 452	906
Total Length of river crossings (m)	10	-	-
Total Length of road crossings (m)	16	-	6
How much capacity is still available for development? (%)	50%	0	0
Operation			
Is there any leakage control? (Pressure regulation) (Yes/No)	No	No	No
How many illegal connections to date?	-	-	-
Have illegal connections be formalised? (Yes/No)	no	no	No
Have servitudes been registered? (Yes/No)	Yes	Yes	Yes

registered? (Yes/No)			
Functionality			
Describe the physical condition (unusable, poor, good)	Good	Good	Good
How well is the infrastructure maintained? (none, infrequent, demand, planned)	Demand	Demand	Demand
Are spare parts readily available? (Yes/No)	Yes	Yes	Yes
Number of breakages / failures per year	2	-	-
What needs to be refurbished? (cost)	-	-	-
What needs to be replaced? (cost)	Replace furrow with new pipeline 550 000	-	-

7.8 Existing reservoir infrastructure

General information	RES 1	RES 2	RES 3	RES 4
Component name	Concrete Res 1	Brick Res 2	Pressure tank 1	Pressure tank 2
Component ID	Res 1	Res 2	Tank 1	Tank 2
Scheme name	Kareedouw 1	Kareedouw 2	Kareedouw upper	Kareedouw lower
Institutional status				
Current owner	Mun	Mun	Mun	Mun
Current operator	Mun	Mun	Mun	Mun
Future owner / WSA (If applicable)	Mun	Mun	Mun	Mun
Future operator / WSP (If applicable)	Mun	Mun	Mun	Mun
Asset assessment				
Date constructed	Unknown	Unknown	2001	Unknown
Expected total lifespan	30 yrs	30 yrs	30 yrs	30 yrs
Estimated replacement value	R400 000	R350 000	R250 000	R200 000
Annual operating cost	-	-	-	-
Annual maintenance cost	1 000	500	1 000	3 000
Type & capacity				
Is the reservoir elevated or on ground level?	Ground	Ground	Ground	Elevated
Type of material (concrete, brick, steel, other – please state)	Concrete	Concrete	Steel	Steel
Reservoir capacity (Mℓ)	0,55	0,455	0,25	0,10
Is it a bulk or reticulation reservoir?	Bulk	Bulk	Retic	Retic
How much capacity is still available for development? (%)	TBD	TBD	TBD	TBD
Operation				
What is the storage factor (x daily use)	2x	2x	2x	3x

Functionality						
Describe the physical condition (unusable, poor, good)	Good	Good	Good	Good		
How well is the infrastructure maintained? (none, infrequent, demand, planned)	Demand	Demand	Demand	Demand		
Are spare parts readily available? (Yes/No)	Yes	Yes	Yes	Yes		
Number of breakages / failures per year	-	-	-	-		
What needs to be refurbished? (cost)	-	-	-	-		
What needs to be replaced? (cost)	-	-	-	-		

7.9 Existing reticulation infrastructure (by supply zone)

General information	Zone 1	Zone 2	Zone 3	Zone 4
Component name				
Component ID	Zone 1	Zone 2	Zone 3	Zone 4
Scheme name	Kareedouw Upper	Kareedouw Lower	Kagiso Heights Uitkyk	Mountain View New Rest
Institutional status				
Current owner	Mun	Mun	Mun	Mun
Current operator	Mun	Mun	Mun	Mun
Future owner / WSA (If applicable)	Mun	Mun	Mun	Mun
Future operator / WSP (If applicable)	Mun	Mun	Mun	Mun
Asset assessment				
Date constructed	Unknown	Unknown	2000	Unknown
Expected total lifespan	30 yrs	30 yrs	30 yrs	30 yrs
Estimated replacement value	144 000	246 000	714 000	1066 500
Annual operating cost	2 700	4 600	20 000	13 200
Annual maintenance cost	1 800	3 100	13 100	8 800
Type & capacity				
Household density (dwelling/km ²)	96	164	711	476
Population served	480	820	4266	2856
Housing layout (Formal or informal)	Formal	Formal	Formal	Formal
Level of service: Access (none or inadequate, RDP, higher level)	Higher	Higher	Higher	Higher
Level of service: Consumption (none or inadequate, RDP, higher level)	Higher	Higher	Higher	Higher
How much capacity is still available for development? (%)	TBD	TBD	TBD	TBD
Operation				
Billing system (Yes/No)	Yes	Yes	Yes	Yes
Tariff (Block definition)	Flat rate	Flat rate	Flat rate	Flat rate

Number of illegal connections to date	None	None	None	None
Number of illegal connections formalised	None	None	None	None
Number of vandalisms at service points or network controls	None	None	None	None
Functionality & condition				
Describe the physical condition (unusable, poor, good)	Good	Good	Good	Good
How well is the infrastructure maintained? (none, infrequent, demand, planned)	Demand	Demand	Demand	Demand
Are spare parts readily available? (Yes/No)	Yes	Yes	Yes	Yes
Number of breakages / failures per year	5	4	4	4
What needs to be refurbished? (cost)	-	-	-	-
What needs to be replaced? (cost)	-	-	-	-

7.10 Schemes to be transferred: water

No water related schemes are being planned to be transferred for Kareedouw.

7.11 Schemes to be transferred: Sanitation

No sanitation related schemes are being planned to be transferred for Kareedouw.

7.12 Schemes to be rehabilitated

Section 12, Tables 1 & 2 summarises the schemes and components which needs to be rehabilitated in Kareedouw's water supply scheme.

7.13 New infrastructure to be built

The decisions taken with regard to service levels drive the need for infrastructure. Based on the total projected water demand figures and the potential benefits of implementing water conservation/water demand strategies, the capacity of the existing infrastructure can be assessed. If it is not adequate to deal with the flows over the planning period, provision needs to be made for expanding the infrastructure.

In order to complete the section on finances, an analysis of future infrastructure to be built needs to be undertaken whereby future costs are calculated.

There is a strong opportunity to impact on new consumers in terms of WC/WDM because it easier to impact on the new rather than fixing the old. Opportunities in reducing water demand of new consumers include selecting appropriate levels of service for different communities, specification of efficient plumbing fittings, efficient reticulation design practices and the use of pre-payment meters.

It should also be noted that new sanitation infrastructure (sewage works) need to be licensed and the licence applications must be made to DWAF prior to the construction of the new works or the extension of existing works.

Section 12 Tables 1 & 2 summarises the schemes and components which need to be built and rehabilitated to enhance Kareedouw's water supply scheme.

7.14 Future internal and connector infrastructure

Section 12 Table 1 summarises the new internal and connector infrastructure that need to be built in order to upgrade the water reticulation system for Kareedouw.

7.15 Future bulk water supply infrastructure

Planning for future requirements were done on the basis of a master planning study in conjunction with a WC/DM strategy which investigates options on the basis of their economic, technical, environmental and social suitability and cost.

Section 12 Table 1 summarises the new bulk water supply infrastructure that need to be built in order to upgrade the bulk water supply to Kareedouw.

7.16 Future bulk sanitation infrastructure

The process for dealing with sanitation infrastructure is similar to that proposed for water supply. However, in this case organic loads were dealt with as well as flow. Treatment works capacity was measured in terms of both these criteria. Also, particular reference were made regarding the arrangements made for pit/tank emptying and treatment of sludge removed from pits or septic tanks.

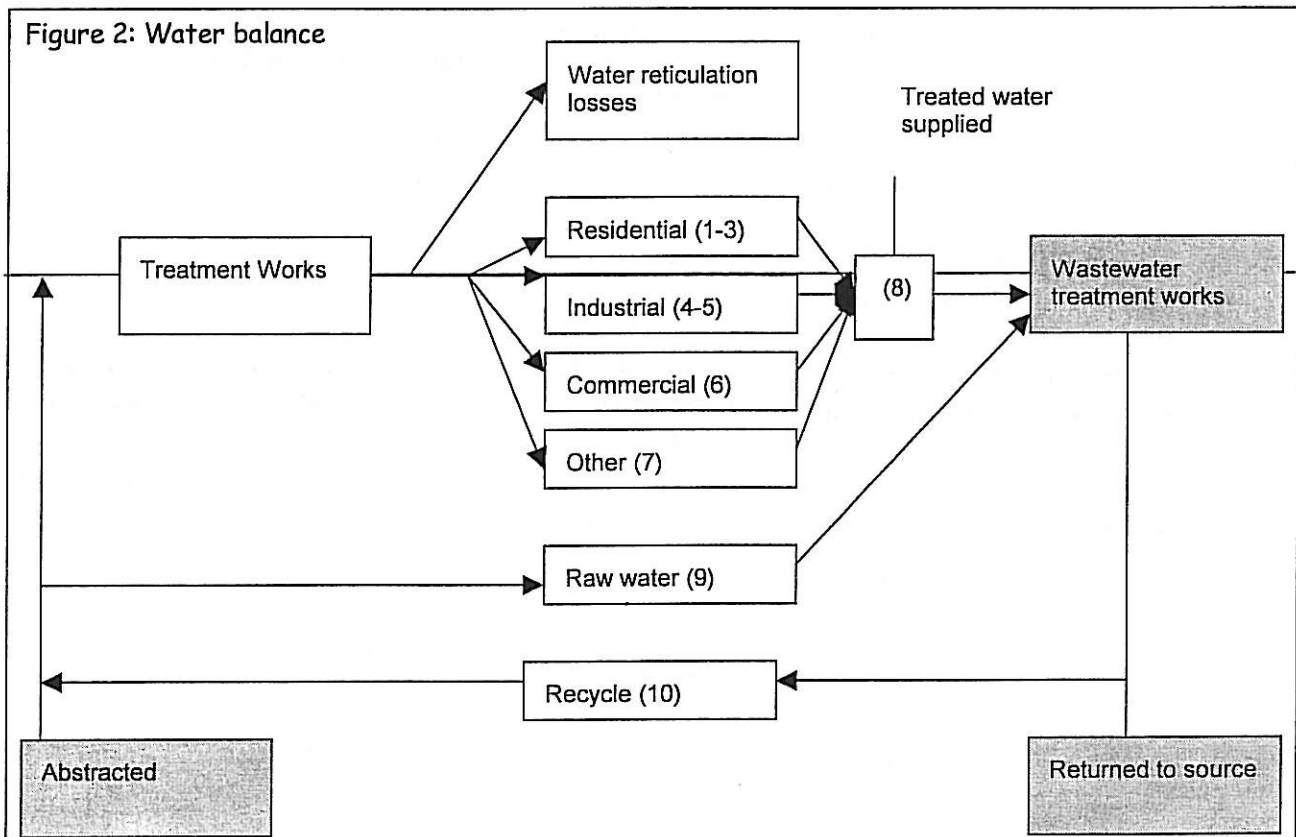
Section 12 Table 2 summarises the new bulk sanitation infrastructure that need to be built in order to upgrade the sanitation infrastructure for Kareedouw.

8. WATER BALANCE

The water balance is an important step in the process of understanding the functioning of a water supply system. With total water demand known (through the targets set for service levels) multiplied by typical consumption patterns for each level of service), the annual water demand and wastewater flow and load projections can be addressed.

Information is required on the amount of bulk water abstracted and treated or purchased. How this water is distributed also needs to be reported on, with a distinction between urban and rural areas due to the likely differences in information available. It is accepted that not all information will be available in the short term, but this information should be gathered as soon as possible.

The total amount of effluent received at the wastewater treatment works should be provided in order to cross-reference. The different information required for water balance is illustrated in the figure below.



Projecting demand

Traditionally the planning process is designed to develop supply resources to "meet the demand". In the water conservation/water demand management (WC/WDM) paradigm water institutions do not plan to "meet the demand." Instead, they attempt to strike a balance amongst many competing objectives. The demand forecast is one tool for striking this balance.

The approach suggested is to develop various demand scenarios based on existing demand analysis and by using demand-forecasting models.

There are three general types of demand forecasting model

- Extrapolation,
- Econometric Forecasts and
- End-Use Forecasts.

It is suggested that the "End-Use Forecast" method be applied in developing various demand scenarios. This methodology requires that the demand for water be unpacked as much as possible by consumer type and end-use. "End-Use Forecast" recognises that the demand for water is just the sum of the end-uses by all the consumers and projections of future water demands are a crucial input to the planning process. This method allows scenarios to be developed by incorporating both demand drivers for different end-uses and by achieving higher levels of water efficiency (e.g. through water conservation/demand management strategies).

Figures for the whole municipal area (i.e. urban and rural consolidated) should be reported.

8.1 Amount of bulk water abstracted (MI/year) :

The following table summarises the amount of bulk water abstracted from the source (borehole cluster) as described in paragraph 7.1 :

Source	Source name	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1	Assegaaibos, Borehole and Drie Krone Fountain	216	217	216	215	214	213	212
2	-	-	-	-	-	-	-	-
TOTAL		216	217	216	215	214	213	212

8.2 Amount of bulk water purchased from others (MI/year)

No bulk water is being purchased from others.

8.3 Water supplied to consumers (MI/year) - Urban

Each water supply system usually comprises a number of distinct water supply zones, which typically comprise a uniform level of supply. All the zones for each level of supply need to be consolidated and reported in the tables below.

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Residential communal water supply	-	-	-	-	-	-	-
2. Residential controlled volume supply	-	-	-	-	-	-	-
3. Residential uncontrolled volume supply	148	149	150	151	152	153	154
4. Industrial supply- Wet	-	-	-	-	-	-	-
5. Industrial supply- Dry	8	8	8	8	8	8	8
6. Commercial supply	20	20	20	20	20	20	20
7. Other supply (including water supplied to other water services institutions)	22	22	22	22	22	22	22
8. Sub-total (treated water supplied) (sum 1 to 7)	198	199	200	201	202	203	204

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WORLD'S

JOURNAL

SECTION 1-1

1950

3. PHYSICAL AND SOCIO-ECONOMIC PROFILE

3.1 MAP – Current situation

3.1.1 Background

Refer to drawings 189610QO/04, 189610QO/05 and 189610QO/06.

Joubertina, as former TLC, is the main town in the Langkloof area and lies between the Kouga and Baviaanskloof Mountain catchments in the north and the Tsitsikamma Mountain range in the south.

Joubertina is a small town and is situated approximately 45km west of Kareedouw on the R62 road. The town is divided into two suburbs, viz. Joubertina Central and Ravinia. Joubertina Central has approximately 310 residential erven, and Ravinia has approximately 640 residential erven. Civil services for 300 additional low-income residential erven were completed in Ravinia during September 2002.

3.1.2 Water Supply Infrastructure

- **Source**

The town dam is situated south of the town in the upper reaches of the Waboomsrivier. The dam is owned and operated by the Kou Kamma Municipality and was constructed in 1987/1988. The dam has a gross storage capacity of 208 000 cubic meters and a nett storage capacity of 185 000 cubic meters. The dam has both a floating draw-off system and a low-level draw-off. A 200 mm diameter pipeline carries raw water from the dam to the Water Treatment Works. The capacity of the gravity main from the dam is estimated to be approximately 2 MI/d.

- **Water Treatment Works**

The water treatment works is situated at the east end of Olivier Street in Joubertina. The water treatment process runs as follows:

Lime dosing → addition of flocculent → flocculation → settling out of particles in horizontal flow sedimentation tank → filtering of water through mechanical pressure filters → chlorine dosing.

The capacity of the horizontal flow sedimentation tank is 2 MI/d. The capacity of the mechanical pressure filters is 1 MI/d (2 x 0.5 MI/d units). The required treatment capacity for a 10 year design period is approximately 1.5 MI/d. The filters are backwashed into a sludge dam with an approximate capacity of 250 m³. The last upgrading of the water treatment works took place in 1999/2000.

- **Storage Facilities**

The town has two storage reservoirs (circular reinforced concrete structures) of 1400kl (620m TWL) and 364 kl (612m TWL) capacity. The reservoirs are situated north of the town across the R62 road. A control cable links the reservoirs and water treatment works, and controls the operation of the pumps at the water treatment works which pump potable water to the storage reservoirs.

Only the 1400 kl reservoir was in use (1999/2000). Both Ravinia and Joubertina are supplied from this single reservoir (one outlet from reservoir splits into 2 x pipelines).

• Distribution System

Water is supplied to different pressure zones of Joubertina through 3 pipelines i.e. 125 mm, 100mm and 75 mm diameter pipes. The majority of the reticulation in Joubertina consists of 50 mm and 75 mm diameter FC pipelines that were installed in 1976. A ring main consisting of a 110 mm diameter uPVC pipeline has been installed to improve the reticulation.

Water is supplied to Ravinia through a 225 mm diameter pipeline. A pressure-reducing valve is installed on this pipeline just before it enters the township. The reticulation in Ravinia was installed in 1985 and is adequately sized to deal with demand beyond 2010.

All the formal erven in Ravinia and Joubertina were serviced (1999/2000) with metered connections.

The old FC reticulation in Joubertina should be replaced as soon as possible as pipes burst at regular intervals.

3.1.3 Sanitation

Joubertina is serviced with septic/conservancy tanks and Ravinia has a full waterborne sewer system.

• Waste Water Treatment Works

The waste water treatment process runs as follows:

Huber rotary mechanical screen → grit channels → 2 x anaerobic reactors → 2 x biological filters → 2 x humus tanks → chlorine contact channels → Krom River.

Only flow in excess of 1 x ADWF is discharged into the river. The rest of the effluent is re-circulated so as to keep the biofilm in the biological filters constantly wetted. This division of flow is carried out in a division box.

Air entrainment is carried out on the effluent pumped to the biological filters to enhance the biological capacity of the filters. A portion of the final effluent is drawn off at the chlorine contact channels and is pumped to the mechanical screen to allow washing of the screen, and to the spray bars in the anaerobic reactors to break up the sludge.

A sludge lagoon has been constructed to allow de-sludging of the anaerobic reactors. The liquid in the lagoon can be de-canted to the stormwater storage dam from where it can be pumped back to the inlet works.

The biological capacity of the works is 320 kg COD/d. The last upgrading of the works took place in 2000. The Works were upgraded with a 10 year design period i.e. 2010.

The Waste Water Treatment Works is not operating as it should and a detailed operating procedure is being drawn up at present.

3.2 MAP- Future Situation

3.2.1 Water Services

Section 12, Table 1 summarises the new projects which needs to be implemented additional to the exsiting infrastructure,in order to upgrade the water supply infrastructure of Joubertina to an acceptable level.

3.2.2 Sanitation

Section 12, Table 2 summarises the new projects which needs to be implemented additional to the existing infrastructure, in order to upgrade the sanitation infrastructure of Joubertina to an acceptable level.

3.3 Physical Profile

The following table is a descriptive summary of the different attributes, which forms the physical profile of Joubertina.

Description	No. of each type	Size	Unit of size	% of total municipal area	Indicate for any (Y/N)		
					Water resource impact	Water user	Waste water return
1. Residential settlements	2	126	Ha	70	Y	Y	Y
2. Commercial areas	7	18	Ha	10	Y	Y	Y
3. Police Stations	1	1.8	Ha	1	Y	Y	Y
4. Magisterial Offices	1	0.9	Ha	0,5	Y	Y	Y
5. Schools	2	9.0	Ha	5	Y	Y	Y
6. Clinics	1	0.9	Ha	0,5	Y	Y	Y
7. Hospitals	1	3.6	Ha	2	Y	Y	Y
8. Prisons	-	-	-	-	-	-	-
9. Industries	1	1.8	Ha	1	Y	Y	Y
10. Mining	1	3.6	Ha	2	Y	Y	Y
11. Agriculture dryland	1	5.4	Ha	3	N	X	X
12. Agriculture irrigation	-	-	-	-	-	-	-
13. Agr. Intensive livestock	-	-	-	-	-	-	-
14. Agr. Extensive livestock	-	-	-	-	-	-	-
15. Resorts and tourism	2	3.6	Ha	2	Y	Y	Y
16. Conservation areas	1	3.6	Ha	2	Y	Y	Y
17. Other(Please state) Crèche	3	1.8	Ha	1	Y	Y	Y
18. Other(Please state)	-	-	-	-	-	-	-

3.4 Topographical profile

The topographical profile for Joubertina can be summarised follows:

Topography type	Percentage of total municipal area
1. Mountainous	75%
2. Rolling	-
3. Flat	25%
4. Coastal	-

3.5 Current Consumer Profile

The entire municipal area of Joubertina is classified as being urban. The following table summarises the different consumer profiles for Joubertina:

	Urban	Dense	Village	Scattered	Farmland	Total
1. Total population	3 361	-	-	-	-	3 361
2. No. of household consumer units	950	-	-	-	-	950
3. No. of dry industrial consumer units	1	-	-	-	-	1
4. No. of wet industrial consumer units	0	-	-	-	-	0
5. No. of commercial consumer units	7	-	-	-	-	7
6. No. other Tourists	14	-	-	-	-	14

3.6 Present Population and Projected Population Growth Rates

According to officials at the Municipality the estimated population for the year 2002 is approximately 3 361 permanent residents. The population growth rate of 1,2% used in the IDP was accepted for the purpose of the WSDP.

Projected population growth figures for the next 5 years will thus be as follows :

Settlement Type	No. of households	Current population	Effective population growth rate (1,2%/a)				
			Year 1	Year 2	Year 3	Year 4	Year 5
Urban	950	3 361	3 401	3 442	3 483	3 525	3 568
Dense	-	-	-	-	-	-	-
Village	-	-	-	-	-	-	-
Farmland	-	-	-	-	-	-	-
Scattered	-	-	-	-	-	-	-
Total	950	3 361	3 401	3 442	3 483	3 525	3 568

The effective population growth rate of 1,2% per annum is substantially lower than historical growth rates due to the influence of the HIV/AIDS pandemic as well as economic and social development.

Calculations for effective population growth rate

The effective population growth rate will most likely change over the next 5 years considering the effect of economic development, social development (e.g. education) and the HIV/Aids pandemic.

The following table may assist planners in determining the effective growth rate considering the settlement type, social character and economic prospects in the following groupings. The "total" and "effective" growth rates will be calculated as a "weighted average" using either the number of settlements, number of households or the respective population.

Calculation sheet for effective population growth rate:

	Urban			Rural				Total
	Formal	In-formal	Total Urban	Dense	Village	Scatter	Farm-land	
1. Total population	3 361	-	3 361	-	-	-	-	3 361
2. Annual population growth rate (natural)	1,2%	-	1,2%	-	-	-	-	1,2%
3. Annual growth adjustment for HIV /AIDS	0	-	0	-	-	-	-	0
4. Annual economic growth rate	1%	-	1%	-	-	-	-	1%
5. Effective annual population growth rate	1,2%	-	1,2%	-	-	-	-	1,2%

3.7 Demographic Trends and Migration Patterns

It is important to accommodate the dynamics of the demography in order to cater for effective service delivery during both peak and off-peak occasions. The following table summarises the demographic trends and migration patterns for Joubertina.

Settlement Type	Permanent resident population	Peak daily labour migration (-) out / (+)in	Peak long-term labour migration (-)out / (+)in	Permanent population changes (-)out / (+)in	Holiday Population
Urban	3 361	+60	+60	-60	100
Dense	-	-	-	-	-
Village	-	-	-	-	-
Farmland	-	-	-	-	-
Scattered	-	-	-	-	-
TOTAL	3 361	+60	+60	-60	100

3.8 Age and Gender Profile

The age and gender profile of various communities may be indicative of the town's development needs and socio-economic status. The age and gender profile for Joubertina, as derived from statistics obtained from the DBSA website, is summarised in the table below :

Settlement Type	Permanent resident population	Aged residents (>65yrs)	Youth residents (<18yrs)	Male residents	Female residents
Urban	3 361	538	1 210	1 513	1 848
Dense	-	-	-	-	-
Village	-	-	-	-	-
Farmland	-	-	-	-	-
Scattered	-	-	-	-	-
TOTAL	3 361	538	1 210	1 513	1 848

3.9 Health profile

The quality of water for domestic usage in Joubertina is of a very high quality and conforms to the conditions of the SABS 241. Water gets sampled, tested and monitored by SAIMR of Port Elizabeth on a monthly basis. The occurrence of water related diseases are thus zero and no records of previous incidents exist. The following table summarises the health profile for Joubertina :

Area	Time frame	Total consumers	Number of consumers affected by							
			Water related disease			Skin effects	Teeth effects	Taste effects	Pipe corrosion	Water colour
			Diarrhoea	Cholera	Bilharzia					
1. Urban	2003	3 361	-	-	-	-	-	-	-	-
2. Rural	-	-	-	-	-	-	-	-	-	-
3. Total		3 361	-	-	-	-	-	-	-	-

3.10 Employment profile

The status and type of employment indicates the nature of household income and income security. It also indicates the ability of the community to pay for services rendered. It can also be useful tool which the Municipality can use to plan or provide for adequate resources to attend to cost recovery measures. The following table summarises the employment profile for Joubertina.

Settlement type	Eligible work force (18 -65yrs)	Permanent residents -without jobs	Seasonal farm workers	Temp'ry domestic workers	Perm. farm workers	Perm. Industry workers	Profes-sional workers
1. Urban	1 613	46	98	28	147	1 160	407
2. Dense	-	-	-	-	-	-	-
3. Village	-	-	-	-	-	-	-
4. Farmland	-	-	-	-	-	-	-
5. Scattered	-	-	-	-	-	-	-
6. TOTAL	1 613	46	98	28	147	1 160	407

3.11 Household Income

A key constraint in planning for infrastructure delivery is household affordability. Knowing the existing situation regarding household incomes is a key part to understanding consumers' affordability levels. These levels should be taken into account when setting service level targets.

The key element of the WSDP is the assessment of affordability of the service to consumers. In order to adequately understand affordability, typical monthly bills need to be assessed against what people are earning. This needs to be looked at in terms of how the Equitable Share will be allocated and what the indigents policy of the municipality is. It should be noted that the overall total municipal bill which includes all municipal services and rates (i.e. not just water and sanitation) for low income earners should not be greater than about 10 percent of income. The table below should be included in order to understand whether consumer's bills are affordable or not. Only households earning less than R1500 were reported on, as this is where affordability constraints are most likely to occur.

Settlement type	Number of households with monthly income of:					Affordability			
	< R800	R800 to R1500	R1500 to R2500	R2500 to R3500	> R3500	Water		Sanitation	
						Typical monthly Bill	Avg % of monthly income	Typical Monthly Bill	Avg % of Monthly Income
1. Urban	370	193	153	58	176	21-93	1,5%	41-22	2,5%
2. Dense	-	-	-	-	-	-	-	-	-
3. Village	-	-	-	-	-	-	-	-	-
4. Farmland	-	-	-	-	-	-	-	-	-
5. Scattered	-	-	-	-	-	-	-	-	-
6. TOTAL	370	193	153	58	176	21-93	1,5%	41-22	2,5%

3.12 Poor household definition

The general definition of poor households by the Municipality is normally considered to be households earning less than R1 500/m jointly. The importance of identifying these residents is for the Municipality to plan the level of services provided in order to set affordable tariffs for cost recovery of services rendered.

3.13 Economic Sectors, GGP contribution and employment

The economic profile of a WSA/Municipality's region is directly related to the development prospects, affordability of services and projected water use. It was therefore deemed important to assess the overall economic situation and development prospects before determining specific water services development actions.

Well-defined distribution figures of the different economic sectors attributing to the GGP were not available, for Joubertina as an individual town. Attributes to the GGP for the entire Kou Kamma Municipality were therefore considered, since daily labour migrations is common practice in the area.

The following table described the sector contributions to the gross geographic product (GGP) and the relating employment figures.

Economic sector	Total no. of employees	No. of local employees	No. of migrating labour	% contribution to local GGP
Farming	331	318	13	T.B.D.
Mining	0	0	0	T.B.D.
Manufacturing	30	29	1	T.B.D.
Utilities	5	5	0	T.B.D.
Construction	14	13	1	T.B.D.
Trade	46	44	2	T.B.D.
Transport	11	11	0	T.B.D.
Business Services	8	8	0	T.B.D.
Social Services	62	60	2	T.B.D.
Private Household	38	36	1	T.B.D.
Exterritorial	0	0	0	T.B.D.
Diplomatic	0	0	0	T.B.D.
National Executive Council	32	31	1	T.B.D.
N/A	944	908	36	T.B.D.
Institution	46	44	2	T.B.D.
TOTAL	1567	1507	60	T.B.D.

3.14 Economic trends

Various economic development initiatives, land reform, poverty relief and other socio-economic restructuring programs are being implemented in the Kou Kamma Municipal area. Although results are deemed to be positive to economic growth, the effect on past and future regional economic trends could not be quantified accurately at this point in time since some negotiations are still at an early stage.

The IDP however, highlighted the following points of concern, which puts a direct strain on economic growth in the region :

- unemployment, poverty and lack of job opportunities
- population growth and urbanisation
- lack of adequate funds
- slow delivery process due to slow administration process
- lack of skills and capacity of communities and beneficiaries
- land availability and ownership
- lack of clear planning guidelines and policies relating to housing
- slow release of Government subsidies for subsidised housing

Although the effect of economic change is primarily based on the population growth rate (migrations), which in return should affect the level of income and affordability for higher levels of service, the Municipality and other stakeholders should take serious cognisance of the abovementioned constraints.

4. SERVICE LEVEL PROFILE

Having an understanding of the current situation allows the most important aspect of the plan to be addressed: service level targets. This section sets out what services will be provided to consumers, both in terms of *level of service* and *quality of service*. Before going into the tables themselves, some explanatory text is given dealing with types of services and the importance of formulating a service level policy.

The vision and mission of the IDP should drive this part of the planning process. For example, the vision of the IDP could be, amongst other things, to ensure that all citizens have access to at least a basic level of service within five years.

The targets set in this section must be compatible with the IDP.

The proposed programme, as defined by the service level and service quality goals, can only be done with reference to the full integrated planning process, considering socio-economic, water resource, environmental, infrastructure, management and financial constraints. This implies that a number of scenarios will have to be tested before the most appropriate one can be decided upon.

Types of services

The concept of service levels relates to the options which consumers can be given with regard to the convenience of the service and hence the amount of water, which they will consume, and the associated wastewater they will generate.

There are ranges of different service types, which can be provided. These are clarified below according to the types reported in the tables.

None or inadequate

This refers to the number of consumer units (or households) that do not have access to basic water supply or sanitation.

Basic water supply comprises:

- a) the provision of appropriate education in respect of effective water use; and
- b) a minimum quantity of potable water of 25 litres per person per day –
 - at a minimum flow rate of not less than 10 litres per minute;
 - within 200 metres of a household; and
 - with an effectiveness of not more than 7 days interruption supply to any consumer per year.

Basic sanitation comprises:

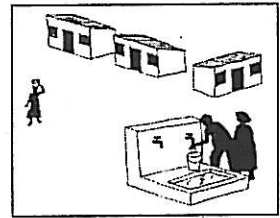
- a) the provision of appropriate health and hygiene education; and
- b) a toilet which is safe, reliable, environmentally sound, easy to keep clean, provides privacy and protection against the weather, well ventilated, keeps smells to a minimum and prevents the entry and exit of flies and other disease-carrying pests.

(Source: Compulsory national standards in terms of Sections 9(1) and measures to conserve water in terms of 73(1)(j) of the Water Services Act.)

Water service levels

Communal water supply

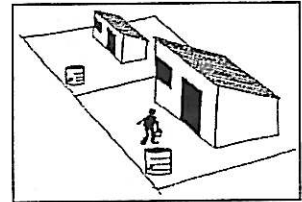
See 'basic water supply' explained above.



Controlled volume supply

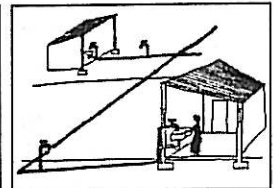
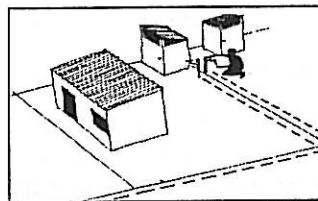
E.g. Yard Tanks

Each house is provided with a tank, which holds about 200 litres. The tank gets filled up once a day. This type of service is often referred to as an intermediate level of supply.



Uncontrolled volume supply

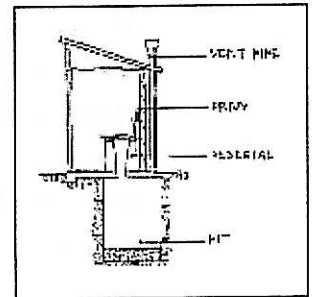
There are generally two types: either the tap stands outside the house on its own or on the wall of an outside toilet (yard tap) or water is piped into the house to take water to taps in the kitchen, bathroom, toilet etc.



Sanitation

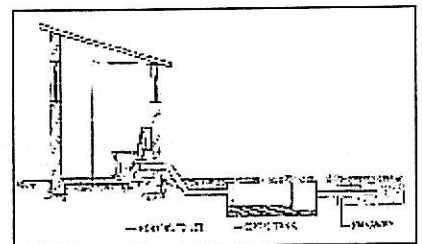
Consumer installations: Dry

See basic sanitation supply explained above. The latrine has a lined pit with a concrete slab over it. An air vent allows smells out into the air above the privy.



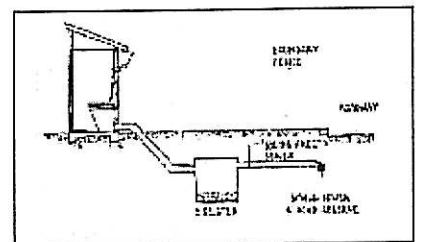
Consumer installations: Wet (septic tanks)

Water is flushed into a digester where certain bacteria live. Digester effluent flows into the soak away, then the ground. The digester has to be pumped out occasionally.

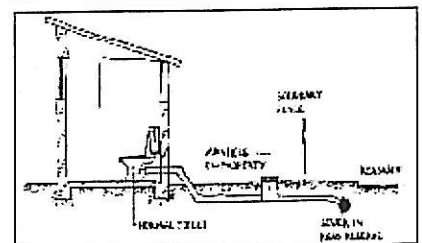


Discharge to wastewater treatment works

Here there are generally two types: intermediate (e.g. aqua privy with solids free sewer which is similar to a septic tank, but instead of a soak away the digester effluent flows into a pipe which connects to a small sewer in the road reserve).



Full waterborne refers to the situation where a flushing toilet is used; the wastewater flows to a sewer on the site, then to sewers on the street. From there it flows to a treatment works to be cleaned, and then into a river.



Service level policy

Of crucial importance in planning for the future is for the WSA to have a service level policy. This involves identifying the different levels of service that will be offered by the WSA and highlighting what the capital and operating cost implications of each level will be. This policy might include what level of service can be provided free of charge versus what levels consumers will be expected to pay for. It is essential that a policy of this nature be in place before targets can be finalised.

The key issue in preparing a service level policy is that higher than basic services should be provided only where households can afford these levels of service, due to the necessity of recovering the increased capital and operating and maintenance costs. While politically difficult, this is likely to be the only way in which sustainable services can be provided in the long term. There are numerous examples of unaffordable service levels being provided with catastrophic results for both households and municipalities.

Finalising a service level policy and setting targets must be done in consultation with the public.

"Community members are very capable of making sound choices in terms of technology and costs of services, if given the right information and involved fully in planning. Community participation is the best way to obtain support and involvement by the beneficiaries leading to acceptance of projects and promoting ownership. The results are often reaped in reduced management and operation costs by the implementing authority and benefits to the community (NASCO, 2000).

Key issues to take into account when formulating a service level policy

The following should be taken into account when formulating a service level policy:

- The types of service levels decided upon have a major impact on capital and operating costs and hence on the long-term viability of service provision. If service levels are set too high the consumers who receive them will not be able to afford to pay for them and are likely to default on their payments, which will in turn, impact on the viability of the service provider.
- Service levels relate to the quantity of water used and thus there is an impact on the environment from which this water has to be abstracted and returned to.
- Risks of pollution associated with the various levels of services must be considered. Higher levels of service have higher risk of pollution.
- The size and density of the settlement should be taken into account when deciding levels of service. In general large settlements produce more waste and hence higher risks of pollution while pollution from smaller settlements is easier to manage.

Existing service levels

Having an understanding of the types of services available, the WSA should assign existing services to these different levels and report the figures in the current columns of the tables. Considerable work will need to be done in integrating information from the different areas that comprise the new water services authorities.

Service level targets

Service level targets (set within the constraints of the service level policy) can be set as follows:

- a) **New consumer units** - This refers to new units that will need to be provided as a result of natural population increase or migration to the area.
- b) **Current backlogs** - This refers to those households that are currently not adequately served, for example those having a supply less than RDP standards.
- c) **Upgrading** - This refers to those households who currently have adequate services but who are to be upgraded to a higher level.

The figures need to be consolidated and translated into targets per year for the number of consumer units, which will have access to each level of service category and recorded in the tables in Table 4.1.

If for any reason basic services cannot be extended to all consumer units within 5 years, reasons need to be stated in the text as to why this is so.

Service level coverage – “quantity”

The current situation needs to be completed for the settlement types i.e. urban and rural (dense, village, scattered and farmland) and consolidated according to the tables below. Separate tables are given for each category of user. Once the scenario has been chosen, the targets need to be reported in the columns from year 1 to year 5. By year 5, there should be no consumer units that have a level of supply that is “none or inadequate”. If this cannot be achieved, reasons for this must be stated in the text.

4.1 Residential consumer units for water

All residential and non-residential erven in the Joubertina area are considered to be in an urban context. All subheadings relating to rural erven as prescribed in the Guidelines for WSDP will thus be ignored since it is of little or no significance.

All the consumers in Joubertina have access to at least a basic level of service regarding water and sanitation.

The following tables summarises the residential consumer units for water services and sanitation currently and the projection for the next 5 years :

No. consumer units with:	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. None or inadequate	-	-	-	-	-	-	-
2. Communal water supply	-	-	-	-	-	-	-
3. Controlled volume supply	-	-	-	-	-	-	-
4. Uncontrolled volume supply: yard tap or house connection	950	950	1250	1250	1250	1250	1250
5. Total served (2+3+4)	950	950	1250	1250	1250	1250	1250
6. Total (1 + 5)	950	950	1250	1250	1250	1250	1250

4.2 Residential consumer units for water: rural: dense

There are no records to report at this stage for this sub-section

4.3 Residential consumer units for water: rural: village

There are no records to report at this stage for this sub-section

4.4 Residential consumer units for water: rural: scattered

There are no records to report at this stage for this sub-section

4.5 Residential consumer units for water: rural: farmland

There are no records to report at this stage for this sub-section

4.6 Residential consumer units for sanitation: urban

No. consumer units with access to sanitation facilities:	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. None or inadequate: Below RDP: Pit	-	-	-	-	-	-	-
2. None or inadequate: Below RDP: Bucket	-	-	-	-	-	-	-
3. Consumer installations: On site dry or equivalent	-	-	-	-	-	-	-
4. Consumer installations: Wet (septic tanks, digester or tanker desludge etc.)	300	300	300	200	200	100	100
5. Discharge to water treatment works (intermediate or full waterborne)	650	650	950	1050	1050	1150	1150
6. Total served (2+3+4+5)	950	950	1250	1250	1250	1250	1250
7. Total (1+6)	950	950	1250	1250	1250	1250	1250

4.7 Residential consumer units for sanitation: rural: dense

There are no records to report at this stage for this sub-section

4.8 Residential consumer units for sanitation: rural: village

There are no records to report at this stage for this sub-section

4.9 Residential consumer units for sanitation: rural: scattered

There are no records to report at this stage for this sub-section

4.10 Residential consumer units for sanitation: rural: farmland

There are no records to report at this stage for this sub-section

4.11 Public Institutions and Dry Industries

The following table summarises the previous, current and projected future non-residential consumers which also impacts on water services and sanitation of Joubertina:

Public amenities Consumer types	Time frame	No. of consumer units	No. of consumer units with access to:			
			None or inadequate	Communal supply	Controlled volume supply	Uncontrolled volume supply
Police stations	Prior 1	1	x	x	x	√
	Current	1	x	x	x	√
	5 years	1	x	x	x	√
Magistrate offices	Prior 1	1	x	x	x	√
	Current	1	x	x	x	√
	5 years	1	x	x	x	√
Businesses	Prior 1	30	x	x	x	√
	Current	30	x	x	x	√
	5 years	35	x	x	x	√
"Dry" industries	Prior 1	3	x	x	x	√
	Current	3	x	x	x	√
	5 years	5	x	x	x	√
Office buildings	Prior 1	4	x	x	x	√
	Current	4	x	x	x	√
	5 years	10	x	x	x	√
Garages	Prior 1	1	x	x	x	√
	Current	1	x	x	x	√
	5 years	2	x	x	x	√
Prisons	Prior 1	1	x	x	x	√
	Current	1	x	x	x	√
	5 years	1	x	x	x	√
Schools	Prior 1	2	x	x	x	√
	Current	2	x	x	x	√
	5 years	2	x	x	x	√
Hospitals	Prior 1	1	x	x	x	√
	Current	1	x	x	x	√
	5 years	1	x	x	x	√
Clinics	Prior 1	1	x	x	x	√
	Current	1	x	x	x	√
	5 years	1	x	x	x	√
Crèches	Prior 1	1	x	x	x	√
	Current	1	x	x	x	√
	5 years	1	x	x	x	√
Other (School Hostel)	Prior 1	1	x	x	x	√
	Current	1	x	x	x	√
	5 years	1	x	x	x	√
Total	Prior 1	47	x	x	x	√
	Current	47	x	x	x	√
	5 years	61	x	x	x	√

4.12 Public institutions and 'dry' industries: rural

There are no records to report at this stage for this sub-section

4.13 Wet Industries

No wet industries currently exist in Joubertina and the Municipality is foreseeing none over next 5 year window frame.

4.14 "Raw" water Consumers

No raw water consumers currently exist in Joubertina and the Municipality is foreseeing none over next 5 year window frame.

4.15 Industrial Consumer Units for sanitation

Industrial consumers typically discharges directly to treatment works and do not have intermediate options as is the case for residential consumers. No significant Industrial consumer currently exists in Joubertina and the Municipality is foreseeing none over next 5 year window frame.

No industries therefore need to permit effluent releases.

4.16 Industries and their permitted effluent releases

There are no records to report at this stage for this sub-section.

5. WATER RESOURCE PROFILE

This section is closely related to the water balance, but where the balance deals with total amounts, this section deals with the conditions associated with use, both in terms of quantity and quality. The total water required as identified in the water balance based on the service level targets needs to be compared to permitted abstraction and return rights as stipulated in the permits. There is therefore some overlap in reporting requirements.

This part of the WSDP is driven by the National Water Act (Act 36 of 1998) and therefore will require dialogue with the Catchment Management Agency (CMA) [or DWAF Regional Office until the CMA is established] and reference to the Catchment Management Strategy/ies (CMS) when these are in place. It is very important that water demand and wastewater flows within the Catchment be viewed against what the resources can sustainably supply and what the likely environmental impacts will be.

Permits govern abstraction and return rights within a Catchment. The additional flows that might arise from the service level targets may well result in requirements over and above what is stated in the permit. The WSA needs to understand what these are and the implications for permits.

It is important to note that all water used within the WSA area needs to be included, including those resources not managed by the authority (such as boreholes and those operated by other water services providers).

The reporting format in this section does not require a separation into urban and rural areas.

Water Source

With the annual water demand and wastewater flows known, the capacity of sources to meet this demand needs to be assessed.

In the case where boreholes are operated independently and water used for human consumption, the WSA should report on these as well.

Water abstracted from sources

Reporting requirements in this section refer to water supplied through the municipal system. This includes borehole water supplied for human consumption. Water abstracted from sources needs to be reported in terms of all providers extracting water. There are three main sources of water:

- abstraction from surface sources within the WSA area of jurisdiction (dams, springs, large rainwater collectors such as natural rock surfaces or streams);
- abstraction from groundwater sources within the WSA area of jurisdiction (boreholes or dug wells);
- purchase from external sources (e.g. a water board).

5.1 Surface Water Sources

The Waboomsrivier Spruit is a perennial mountain stream, which is utilised in the provision of bulk water to Joubertina. The permitted abstraction however is unknown to the Municipality.

5.2 Groundwater Sources

No groundwater sources are being utilised in the provision of bulk water to Joubertina.

5.3 Groundwater monitoring

No groundwater sources are being utilised in the provision of bulk water to Joubertina.

5.4 External sources (where the WSA purchases water from others)

No external sources or purchased water are being utilised in the provision of bulk water to Joubertina.

5.5 Water returned to resources

No water is being directly returned to resources.

5.6 Quality of water taken from source : urban

The following table comments and summarises the quality of water taken from the source :

	At source	At reservoir	At tap
Is water quality measured? (yes/no)	no	yes	no
1. Do you monitor it yourself? (yes/no)	no	yes	no
2. If no, who does?	no	KKM & NMMM	no
3. Monitoring intervals (daily, weekly, monthly, quarterly, bi-annually, annually)	no	Daily & Annually	no
4. Are these results available in electronic format? (yes/no)	no	Yes(annually)	no
5. % time (days) within SABS 241 standards per year	no	95%	no

5.7 Quality of water taken from source : rural

There are no records to report at this stage for this sub-section

5.8 Reporting on quality of water taken from source : Urban and Rural

	Yes/ No	Method of notification
If quality of water taken from source does not comply, are urban residents notified?	No	N/A
If quality of water taken from source does not comply, are rural residents notified?	No	N/A

*Note: The only time that water does not comply is in times of excessive rainfall

5.9 Quality of water returned to the resource: urban

Quality of water returned to the resource is increasingly becoming an issue in South Africa. Water quality is regulated according to permits, licenses and standards and it is very important that these be put in place if not already effective.

The water returned to the resource may be from either point sources e.g. wastewater treatment works, the quality of which will be measurable, or diffuse sources e.g. grey water from informal settlements the quality of which will be less easy to measure.

Once again, urban areas are likely to have more established monitoring arrangements and for these reason the distinction is made between urban and rural areas. Different types of pollution need to be dealt with in this section, both from "point" (e.g. an industry) and "diffuse" (e.g. an informal settlement or agricultural holding) sources.

Point source pollution

Point sources refer to discharges from identifiable users at a point (generally a pipe discharging to a stream). Often this is associated with industries but also includes wastewater treatment works that may discharge water containing waste back to a resource. For industries not discharging directly to a resource but to the sewer, the WSA needs to monitor the types of chemicals being disposed of and that these are disposed of to the wastewater treatment works within the parameters laid down in bylaws. In this way, the effluent can be treated effectively with no adverse effects on the wastewater treatment works' operation. If these sources are polluting directly to a resource because of, for example, poor stormwater management, steps need to be taken to ensure that these flows are directed through treatment works. It is therefore important for the WSA to monitor the types of effluent being disposed of into the sewers as well as the discharges from the wastewater treatment works itself.

Diffuse source pollution

Diffuse sources of pollution refers to a number of cases where polluted water is returned to the resource (both surface and groundwater) without being treated. This mainly occurs when:

- There are no, or poorly managed stormwater systems that result in run-off and pollution of water sources.
- There are poorly operated and maintained sanitation facilities eg. blocked sewers, pump failures etc. leading to sewage leaks and pollution of water resources.
- There is runoff from informal settlements (e.g. where standpipes are poorly designed with no drainage system).
- There are inadequate sewage works.
- Sludge from pit latrines is not disposed of adequately. To avoid this, the use of double pits could be explored.
- There is runoff from solid waste sites (e.g. where no leachate collection system exists).
- There is run-off from agricultural areas e.g. feedlots, cultivated lands.

The most urgent task to be undertaken is for the WSA to find out where there are problems and prioritise those areas that represent the greatest threat to water quality.

The WSA needs to address the above (i.e. both point and diffuse sources of pollution), but for Edition 2001, the following must be reported.

	In the return effluent	In the stormwater	In the river
1. Is water quality measured? (yes/no)	yes	no	no
2. Do you monitor it yourself? (yes/no)	yes	no	No
3. If no, who does?	N/A	none	DWAF/NMMM
4. Monitoring intervals (weekly, monthly, quarterly, bi-annually, annually)	Monthly	N/A	Quarterly
5. Are these results available in electronic format?	No	N/A	yes
6. For wastewater treatment works discharges to water resource: % time within requirements of special or general standards (Regulation 991).	95%		

5.10 Quality of water returned to the resource: rural

There are no records to report at this stage for this sub-section.

5.11 Pollution contingency measures

No pollution contingency measures are in place in Joubertina since no pollution occurs or has previously been recorded.

6 WATER CONSERVATION / DEMAND MANAGEMENT (WC/WDM)

Water Conservation can be defined as the minimisation of loss or waste, the care and protection of water resources and the efficient and effective use of water.

Water Demand Management can be defined as the adaptation and implementation of a strategy by a water institution or consumer to influence the water demand and usage of water in order to meet any of the following objectives: economic efficiency, social development, social equity, environmental protection, sustainability of water supply and services, and political acceptability.

Promoting the efficient use of water should be a driver of the WSDP process, particularly since South Africa is a water scarce country. Water required as a result of the service level targets may exceed water available. There are two options in this case, either build new infrastructure (which is very costly), or institute a WC/WDM strategy, or a combination of the two. The need to implement WC/WDM is not limited to water resource requirements. The implementation of WC/WDM can have a significant impact in ensuring effective, affordable and sustainable water services with social, economic and environmental benefits.

The potential benefits of this approach for the country as a whole are significant as indicated in the box below.

"It is estimated that the potential economic benefit of WC/WDM over the next fifteen years in the water services sector in South Africa is approximately R50 billion. This could be achieved through cost savings in postponing capital infrastructure and in operating costs."

"... it is calculated that the total opportunity in reducing water demand in the water services sector in South Africa is approximately 39 percent of the total existing demand"

(Source: Water Conservation and Water Demand Management Strategy for the Water Services Sector, 2000)

The total figures for water balance can only be calculated once WC/WDM has been conducted for the area.

WC/WDM Strategy

The National Water Audit (Section 2 (h) (iii)) requires WSAs to prepare WC/WDM strategies in order to achieve more efficient use of water. The Directorate Water Conservation has prepared comprehensive guidelines in this regard, including a model strategy for water services authorities. A model strategy has also been developed for regional water services institutions such as water boards and metropolitan councils that have bulk water supply functions. The WC/WDM strategy for WSAs also needs to form part of the regional WC/WDM strategy. It is important to recognise that although WSAs are ultimately at the interface of WC/WDM initiatives the needs and objectives of the strategy need to be looked at from various perspectives including consumers, municipalities, bulk suppliers, catchment management agencies and the national perspective.

"The purpose of the WC/WDM model strategies is to enhance the management of water services in order to achieve sustainable, efficient and 100 percent affordable services to all consumers. The aim of the model strategies is to influence all functions and business plans related to water services. The emphasis of the model strategies is to influence water services to incorporate social, environmental, economic and technical considerations."

Source: Water Conservation and Water Demand Management Strategy for the Water Services Sector, 2000)

These guidelines include a very useful overview of how such strategies can be applied within the different areas that comprise new municipalities.

The model strategy comprises a number of elements. WSAs are then encouraged to use the elements to develop their own detailed strategies, which should identify appropriate actions and business plans to meet the stated objectives and goals. The focus of the model strategy is for a medium to large size WSA. Smaller WSAs are encouraged to implement as many aspects of the strategy that are feasible.

Many of the elements of such a strategy are part of the WSDP requirements. However, particularly the larger, more capacitated WSAs are encouraged to produce specific strategies based on the above mentioned model strategy. Should this be the case, the WSA should attach their strategy to their WSDP submission.

There are a host of activities that a WSA could embark upon to ensure more efficient use of water. These can be classified according to the following four categories:

- Water resource management
- Distribution management
- Consumer/end user demand management
- Effluent/return flow management

The implementation of a WC/WDM strategy does not only refer to measures that reduce water wastage and inefficient use but also include measures to effectively manage and sustain efficiency targets. Some of the priority requirements are to install systems that measure and identify certain key parameters such as minimum night flows and systems to enable detailed and regular water audits and water balances.

Depending on the circumstances, the initial focus of reducing demand could be the reduction in unaccounted for water (UAW) and a reduction on the wastage and inefficient use of non revenue water consumption (i.e. the reduction of involuntary water usage by non-paying consumers). However, this does not mean that WSAs should not target paying consumers and WSAs should also consider implementing other activities to reduce water consumption. Some of the activities that a WSA should implement include quantifying the exact potential through pilot projects and through further research. Pilot projects should include retro-fitting of plumbing fittings, rain water harvesting, retro-fit water saving devices and the use of indigenous plants. A communication and awareness campaign needs to be an integral and sustainable intervention of any WC/WDM strategy.

Water resource management interventions

Water resource management interventions should be dealt with in supporting text and should deal with interventions such as the removal of invading plants, recharge of aquifers, rehabilitation of wetlands and clean up campaigns of rivers.

Targets for reducing unaccounted for water and water inefficiencies

Total figures for unaccounted for water (UAW) are reported as part of the water balance, however activities to reduce unaccounted for water and water inefficiencies are unpacked in this section.

Unaccounted for water is defined as the difference between the measured volumes of water put into the supply system and the total volume of water measured to authorised consumers.

Internal plumbing leaks are leaks past the consumer meter. Such leaks can be assessed through sample surveys of consumer households and by analysing the minimum night flow of bulk meters.

6.4 Reducing high pressures for residential consumers : Rural

There are no records to report at this stage.

Consumer/end-use demand management

There are a number of ways of ensuring the reduction of water demand by consumers. These can generally be divided into two categories. The first is to influence the behaviour of consumers and the second is through the implementation of assistance projects.

Assistance projects are interventions of best management practices, which are funded or partially funded by WSAs. Examples include projects to repair plumbing leaks, to retrofit dual-flush toilets, installation of dual water distribution systems (i.e. the use of readily available saline groundwater for the flushing of toilets and treated potable water for drinking and other purposes) and to replace exotic gardens with alternative waterwise gardens. More efficient use can also be made through recycling of water. This can be to different standards depending on what it will be used for. For example, consumers can be encouraged to use grey water, i.e. bath, shower, etc. for watering of their gardens.

One of the key elements of a sustainable WC/WDM strategy is to develop and promote activities that are also beneficial to consumers. WSAs are encouraged to adopt a "win-win" approach and not introduce punitive measures unless they have to. One of the most effective ways to encourage consumers to use water more efficiently is through tariff mechanisms.

Influencing consumer behaviour

Public information and school education programmes are key to highlighting the need and benefits of initiating WDM/WC strategies. These programmes could include brochures, paid advertising, newsletters or magazine inserts, demonstrations, exhibits, internet web pages, informative billing, and demonstration gardens.

For DWAF's monitoring role, WSAs should report the information in the tables that follow.

6.5 Consumer/end-use demand management: public information and education programmes

The Municipality does not have an individual public information and education program for water conservation in place en depend mainly on Government programs and initiatives to get the message across.

6.6 Leak and meter repair programmes

Assistance programmes

WSAs should prioritise assistance programmes in the former "urban black townships". Such assistance programmes should include a number of measures that will ensure efficient water usage and build trust between the consumer and the WSA. Houses in these townships previously belonged to the municipalities and were not adequately maintained often resulting in significant plumbing leaks.

The Municipality plan to develop a Water Management Policy that will be specifically aimed at reducing the volume of unaccounted for Water and encouraging consumers to apply more effective and efficient use of water. Leaflets of the Policy will be sent out with each Municipal bill.

The Policy will involve the continuation of existing procedures i.e. meter repair programmes, regular inspection of the network and prompt attention to leaks and consumer complaints. It will also include prompt and regular water auditing, development of a communication and education programme, the possible introduction of step tariffs for water and sanitation, introduction of legislation to enforce recycling of commercial water consumption, etc.

The following table summarises what the Municipality targets to achieve by introducing this Policy :

Number of consumer units to be targeted by:	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Leak repair assistance programme	950	950	1 250	1 250	1 250	1 250	1 250
2. Retro-fitting of water efficient toilets	0	0	0	0	0	0	0
3. Meter repair programme	950	950	1 250	1 250	1 250	1 250	1 250

6.7 Working for Water Programme

One of the key environmental impacts on surface water resources is the invasion of the natural vegetation on river banks by alien vegetation which transpire excessive water volumes. DWAF has initiated the Working for Water Programme to eradicate alien vegetation from rivers and streams and thereby conserve water resources for the in-stream environmental reserve and other priority use. The programme also aims to free clogged river channels to reduce the effect of floods.

Location (river reach)	Project name	Description	Estimated water volume recovered	Status of project	Jobs created
Wabooms rivier	Wabooms rivier	Removal of alien vegetation	Unknown	Complete	16

7. WATER SERVICES INFRASTRUCTURE PROFILE

7.1 Existing Infrastructure

See paragraph 3.1

7.2 Brief functional description of existing main infrastructure

See paragraph 3.1

7.3 Existing groundwater infrastructure

No groundwater sources are being utilised in the provision of bulk water to Joubertina.

7.4 Existing surface water infrastructure

General information	SW1
Component name	Waboomsrivier Dam
Component ID	SW1
Scheme name	Joubertina Water
Institutional status	
Current owner	Municipality
Current operator	Municipality
Future owner / WSA (If applicable)	Municipality
Future operator / WSP (If applicable)	Municipality
Asset assessment	
Date constructed	1987/1988
Expected total lifespan	Unknown
Estimated replacement value	Unknown
Annual operating cost	N/A
Annual maintenance cost	N/A
Type & capacity	
Catchment area (km ²)	+/- 400
Full supply storage capacity (m ³)	208 000
Type of structure (dam, river, rim of river, abstraction)	Dam
Spillway capacity (Ml/day)	2
Total annual assured yield (m ³ /annum)	730 000
Can the dam capacity be increased? (Yes/No)	Yes
How much capacity is still available for development? (%)	15%
Operation	
Dam safety registration (Yes/No)	Yes
% Allocation for domestic consumption	11%
% Of domestic allocation used	100%
Is the abstraction registered with DWAF? (Yes/No)	Yes
When was the last dam safety inspection? (Date)	November 2002
When was the last water restriction? (Date)	July 2002
How many water restrictions were there in the last 5 years?	5
Functionality	
How well is the infrastructure maintained? (none, infrequent, demand, planned)	Planned
Are spare parts readily available? (Yes/No)	Yes
Number of breakages / failures per year	None
Describe the physical condition (in operation, poor, good)	Good
What needs to be refurbished ? (cost)	Metering Equipment R30 000
What needs to be replaced ? (cost)	-

7.5 Existing water treatment works infrastructure

The following table summarises the existing water treatment works infrastructure as described in paragraph 7.1 :

General information	WTW 1
Component name	WTW1
Component ID	
Scheme name	Joubertina WTW
Institutional status	
Current owner	Mun
Current operator	Mun
Future owner / WSA (If applicable)	Mun
Future operator / WSP (If applicable)	Mun
Asset assessment	
Date constructed	Unknown
Expected total lifespan	30 Years
Estimated replacement value	Unknown
Annual operating cost	Unknown
Annual maintenance cost	Unknown
Type & capacity	
Type of plant (description)	Lime stabilisation, flocculation, filters
Water source (purchased, ground, surface)	Surface
Physical water quality: Turbidity	Low
Chemical causing quality problem (>10 mg/l)	-
Chemical causing quality problem (>10 mg/l)	-
Chemical causing quality problem (>10 mg/l)	-
Chemical causing quality problem (>10 mg/l)	-
Design Capacity (Mℓ/day)	1,5
How much capacity is still available for development? (%)	0
Operation	
Total volume of water treated per year (Mℓ)	547,5
Operating hours per day	18
How often is water quality monitored? (daily, weekly, monthly, annual, never)	Daily
What laboratory is used?	KKM/NMMM
% Of the time that water is chlorinated	100%
% Of water lost through process (eg. Waste water)	15%
Functionality	
Describe the physical condition (in operation, poor, good)	GOOD
How well is the infrastructure maintained? (none, infrequent, demand, planned)	DEMAND
Are spare parts readily available? (Yes/No)	YES
Number of breakages / failures per year	7
What needs to be refurbished? (cost)	/
What needs to be replaced? (cost) 3x pumps	3x pumps R 120 000

7.6 Existing pump stations infrastructure

General information	PS1
Component name	PS 1
Component ID	
Scheme name	Reservoir Pumpstation
Institutional status	
Current owner	Municipality
Current operator	Municipality
Future owner / WSA (If applicable)	Municipality
Future operator / WSP (If applicable)	Municipality
Asset assessment	
Date constructed	Unknown
Expected total lifespan	15
Estimated replacement value	Unknown
Annual operating cost	R38 000
Annual maintenance cost	R45 000
Type & capacity	
Number of pumps	1
Pumping head (m)	15
Discharge rate (Mℓ/day)	Unknown
Pump station Kilowatt	Unknown
Motor speed	Unknown
Type of power supply (solar, electricity, engine, other – please state)	Electricity
Type of superstructure (concrete, brick, structural steel, other – please state)	Brick
How much capacity is still available for development? (%)	50%
Operation	
Operating hours per day	18
Are there any standby pumps available? (Yes/No)	No
Functionality	
Describe the physical condition (in operation, poor, good)	In Operation
How well is the infrastructure maintained? (none, infrequent, demand, planned)	Demand
Are spare parts readily available? (Yes/No)	Yes
Number of breakages / failures per year	7
What needs to be refurbished? (cost)	1 Standby Pump @ R30 000
What needs to be replaced? (cost)	-

7.7 Existing bulk pipeline infrastructure

The following table summarises the existing bulk pipeline infrastructure as described in paragraph 7.1 :

General information	Zone 1	Zone 2
Component name	Mountain Stream	WTW pipeline
Component ID		
Scheme name		
Institutional status		
Current owner	Mun	Mun
Current operator	Mun	Mun
Future owner / WSA (If applicable)	Mun	Mun
Future operator / WSP (If applicable)	Mun	Mun
Asset assessment		
Date constructed	Unknown	Unknown
Expected total lifespan	Unknown	Unknown
Estimated replacement value	2 100 000	1 500 000
Annual operating cost	-	-
Annual maintenance cost	-	15 000
Type & capacity		
Pipe material (Most common)	AC	AC
Avg. Diameter (mm)	250	150
Avg. Pipe Class	6	6
Avg. Discharge rate (ℓ/s)	-	-
Total Length above ground (m)	40	0
Total Length below ground (m)	3000	500
Total Length of river crossings (m)	7	0
Total Length of road crossings (m)	20	65
How much capacity is still available for development? (%)	30%	30%
Operation		
Is there any leakage control? (Pressure regulation) (Yes/No)	No	No
How many illegal connections to date?	none	none
Have illegal connections be formalised? (Yes/No)	yes	yes
Have servitudes been registered?	yes	yes
Functionality		
Describe the physical condition (unusable, poor, good)	good	poor
How well is the infrastructure maintained? (none, infrequent, demand, planned)	demand	demand
Are spare parts readily available? (Yes/No)	Yes	Yes
Number of breakages / failures per year	1	16
What needs to be refurbished? (cost)	-	Valves – 65 000
What needs to be replaced? (cost)	-	-

7.8 Existing reservoir infrastructure

The following table summarises the existing reservoir infrastructure as described in paragraph 7.1 :

General information	RES 1	RES 2	RES 3
Component name	Res 1		
Component ID			
Scheme name	Joubertina Res1		
Institutional status			
Current owner	Mun		
Current operator	Mun		
Future owner / WSA (If applicable)	Mun		
Future operator / WSP (If applicable)	Mun		
Asset assessment			
Date constructed	unknown		
Expected total lifespan	30		
Estimated replacement value	R200 000		
Annual operating cost	-		
Annual maintenance cost	-		
Type & capacity			
Is the reservoir elevated or on ground level?	Ground		
Type of material (concrete, brick, steel, other – please state)	Concrete		
Reservoir capacity (MI)	1.76		
Is it a bulk or reticulation reservoir?	Retic		
How much capacity is still available for development? (%)	0		
Operation			
What is the storage factor (x daily use)			
Functionality			
Describe the physical condition (unusable, poor, good)	Good		
How well is the infrastructure maintained? (none, infrequent, demand, planned)	Demand		
Are spare parts readily available? (Yes/No)	Yes		
Number of breakages / failures per year	0		
What needs to be refurbished? (cost)	200 000		
What needs to be replaced? (cost)	-		

7.9 Existing reticulation infrastructure (by supply zone)

The following table summarises the existing reticulation infrastructure as described in paragraph 7.1:

General information	Zone 1	Zone 2	Zone 3
Component name	Z 1	Z 2	
Component ID			
Scheme name	Joubertina	Ravinia	
Institutional status			
Current owner	Mun	Mun	
Current operator	Mun	Mun	
Future owner / WSA (If applicable)	Mun	Mun	
Future operator / WSP (If applicable)	Mun	Mun	
Asset assessment			
Date constructed	Unknown	Unknown	
Expected total lifespan	30	30	
Estimated replacement value	2 600 000	2 700 000	
Annual operating cost	120 000	120 000	
Annual maintenance cost	140 000	140 000	
Type & capacity			
Household density (dwelling/km ²)	460	720	
Population served	800	2561	
Housing layout (Formal or informal)	Formal	Formal	
Level of service: Access (none or inadequate, RDP, higher level)	Higher	Higher	
Level of service: Consumption (none or inadequate, RDP, higher level)	Higher	Higher	
How much capacity is still available for development? (%)	40%	40%	
Operation			
Billing system (Yes/No)	Yes	Yes	
Tariff (Block definition)	Block		
Number of illegal connections to date	0	0	
Number of illegal connections formalised	0	0	
Number of vandalisms at service points or network controls	-	-	
Functionality & condition			
Describe the physical condition (unusable, poor, good)	Good	Good	
How well is the infrastructure maintained? (none, infrequent, demand, planned)	Demand	Demand	
Are spare parts readily available? (Yes/No)	Yes	Yes	
Number of breakages / failures per year	12	40	
What needs to be refurbished? (cost)	TBD	TBD	
What needs to be replaced? (cost)	TBD	TBD	

7.10 Schemes to be transferred: water

No water related schemes are being planned to be transferred for Joubertina.

7.11 Schemes to be transferred: Sanitation

No sanitation related schemes are being planned to be transferred for Joubertina.

7.12 Schemes to be rehabilitated

Section 12, Tables 1 & 2 summarises the schemes and components that need to be rehabilitated in Joubertina's water supply scheme.

7.13 New infrastructure to be built

The decisions taken with regard to service levels drive the need for infrastructure. Based on the total projected water demand figures and the potential benefits of implementing water conservation/water demand strategies, the capacity of the existing infrastructure can be assessed. If it is not adequate to deal with the flows over the planning period, provision needs to be made for expanding the infrastructure.

In order to complete the section on finances, an analysis of future infrastructure to be built needs to be undertaken whereby future costs are calculated.

There is a strong opportunity to impact on new consumers in terms of WC/WDM because it is easier to impact on the new rather than fixing the old. Opportunities in reducing water demand of new consumers include selecting appropriate levels of service for different communities, specification of efficient plumbing fittings, efficient reticulation design practices and the use of pre-payment meters.

It should also be noted that new sanitation infrastructure (sewage works) need to be licensed and the licence applications must be made to DWAF prior to the construction of the new works or the extension of existing works.

Section 12, Tables 1 & 2 summarises the schemes and components that need to be built and rehabilitated to enhance Joubertina's water supply scheme.

7.14 Future internal and connector infrastructure

Section 12 Table 1 summarises the new internal and connector infrastructure that needs to be built in order to upgrade the water reticulation system for Joubertina.

7.15 Future bulk water supply infrastructure

Planning for future requirements were done on the basis of a master planning study in conjunction with a WC/DM strategy which investigates options on the basis of their economic, technical, environmental and social suitability and cost.

Section 12, Table 1 summarises the new bulk water supply infrastructure that needs to be built in order to upgrade the bulk water supply to Joubertina.

7.16 Future bulk sanitation infrastructure

The process for dealing with sanitation infrastructure is similar to that proposed for water supply. However, in this case organic loads were dealt with as well as flow. Treatment works capacities were measured in terms of both these criteria. Also, particular references were made regarding the arrangements made for pit/tank emptying and treatment of sludge removed from pits or septic tanks.

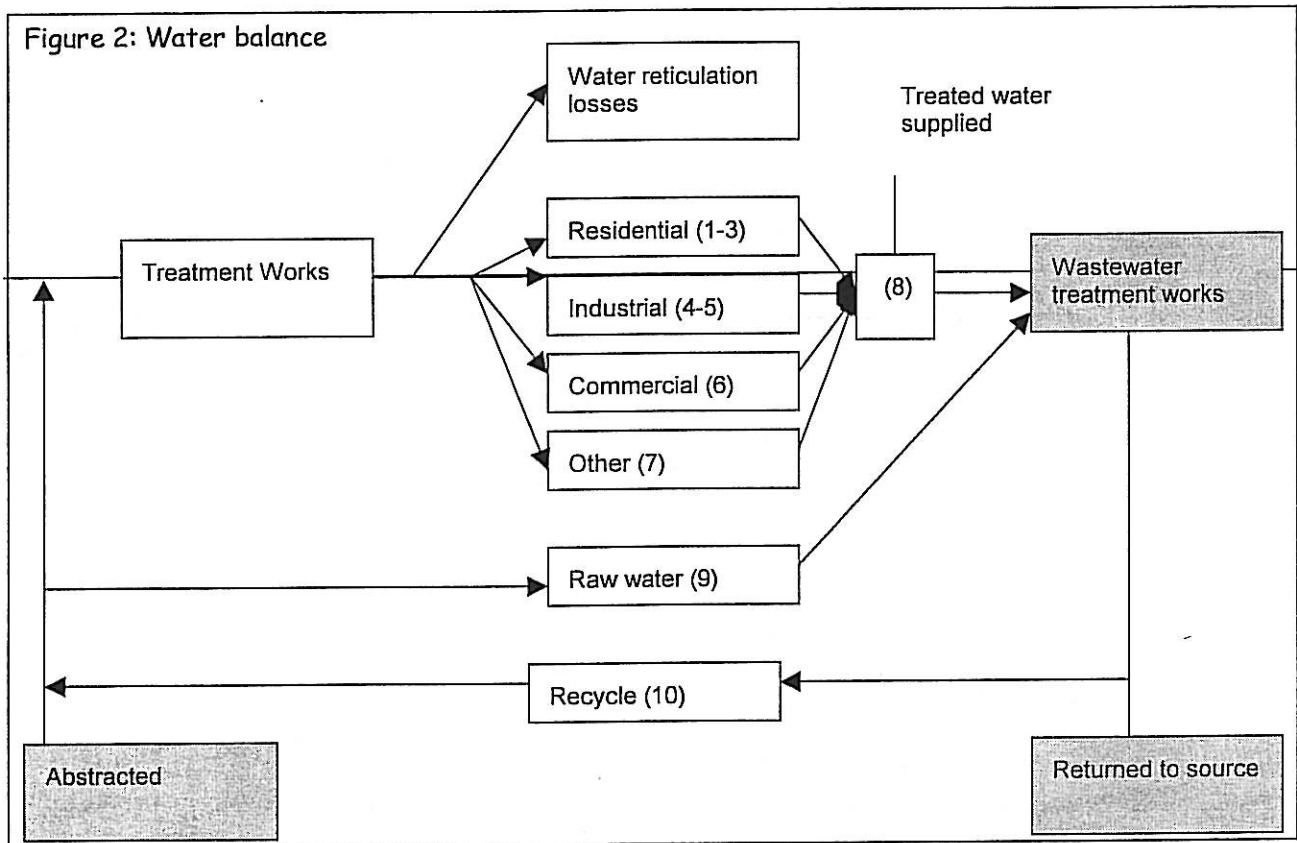
Section 12 Table 2 summarises the new bulk sanitation infrastructure that needs to be built in order to upgrade the sanitation infrastructure for Joubertina.

8. WATER BALANCE

The water balance is an important step in the process of understanding the functioning of a water supply system. With total water demand known (through the targets set for service levels) multiplied by typical consumption patterns for each level of service, the annual water demand and wastewater flow and load projections can be addressed.

Information is required on the amount of bulk water abstracted and treated or purchased. How this water is distributed also needs to be reported on, with a distinction between urban and rural areas due to the likely differences in information available. It is accepted that not all information will be available in the short term, but this information should be gathered as soon as possible.

The total amount of effluent received at the wastewater treatment works should be provided in order to cross-reference. The different information required for water balance is illustrated in the figure below.



Projecting demand

Traditionally the planning process is designed to develop supply resources to "meet the demand". In the water conservation/water demand management (WC/WDM) paradigm water institutions do not plan to "meet the demand." Instead, they attempt to strike a balance amongst many competing objectives. The demand forecast is one tool for striking this balance.

The approach suggested is to develop various demand scenarios based on existing demand analysis and by using demand-forecasting models.

There are three general types of demand forecasting model

- Extrapolation,
- Econometric Forecasts and
- End-Use Forecasts.

It is suggested that the "End-Use Forecast" method be applied in developing various demand scenarios. This methodology requires that the demand for water be unpacked as much as possible by consumer type and end-use. "End-Use Forecast" recognises that the demand for water is just the sum of the end-uses by all the consumers and projections of future water demands are a crucial input to the planning process. This method allows scenarios to be developed by incorporating both demand drivers for different end-uses and by achieving higher levels of water efficiency (e.g. through water conservation/demand management strategies).

Figures for the whole municipal area (i.e. urban and rural consolidated) should be reported.

8.1 Amount of bulk water abstracted (MI/year) :

The following table summarises the amount of bulk water abstracted from the source as described in paragraph 7.1 :

Source	Source name	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1	Waboomsrivier	172	173	174	173	172	172	173
2	-	-	-	-	-	-	-	-
TOTAL		172	173	174	173	172	172	173

8.2 Amount of bulk water purchased from others (MI/year)

No bulk water is being purchase from others.

8.3 Water supplied to consumers (MI/year) - Urban

Each water supply system usually comprises a number of distinct water supply zones which typically comprise a uniform level of supply. All the zones for each level of supply are consolidated and reported in the tables below.

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Residential communal water supply	-	-	-	-	-	-	-
2. Residential controlled volume supply	-	-	-	-	-	-	-
3. Residential uncontrolled volume supply	119	120	120	121	122	123	124
4. Industrial supply- Wet	-	-	-	-	-	-	-
5. Industrial supply- Dry	6	6	6	6	7	7	7
6. Commercial supply	16	16	16	16	16	16	17
7. Other supply (including water supplied to other water services institutions)	17	18	18	18	18	18	18
8. Sub-total (treated water supplied) (sum 1 to 7)	158	159	161	162	163	164	166
9. Raw water (i.e. supplied untreated)	-	-	-	-	-	-	-

WSDP 3

KOU KAMMA RURAL AREAS

WED 3

SOU KANNA RURAL AREA

1. COLDSTREAM

1. GENERAL

Refer to drawing no 189610QO/01, 189610QO/14 and 189610QO/15.

Coldstream is a small rural township in the Tsitsikamma-area, approximately 45km south-west of Joubertina, south of the N2 route on the western boundary of the Kou Kamma. Medium to low-income housing is the predominant land-use pattern and forestry and farms surrounding the township, are the main source of employment and income to the residents. The township also has the following facilities:

- 2 schools
- 1 crèche
- 1 service centre
- 1 community hall
- sports field
- churches
- shops and general dealers

The township consists of approximately 510 residential erven, of which 395 erven is in Coldstream village and 115 erven in Die Rye/Puntjiesbos. The final planning and documentation for a proposed new low-cost housing development of approximately 300 residential erven is imminent.

2. POPULATION

The current population in Coldstream is estimated at approximately 2 805 residents, based on an average household size of 5.5 people per household. With the planned new housing project of 300 low-income houses the population is expected to boost due to the influx of people from surrounding areas to approximately 4 455 residents. Based on a nominal population growth rate of 1,2% per annum (Kou Kamma IDP, 2003 revision), the projected population will be as follows :

PROJECTED AT A NOMINAL GROWTH RATE OF 1,2% PER ANNUM						
YEAR	2003	2004	2005	2006	2007	2008
POPULATION	2 805	4 455	4 508	4 563	4 617	4 673

3. EXISTING INFRASTRUCTURE

3.1 WATER SUPPLY

3.1.1. Sources

Coldstream receives bulk water via a weir from the Lottering River from where it is pumped via a Ø 160mm uPVC Class 9 pipeline to the small packaged Water Treatment Works.

3.1.2. Water Treatment Works

The Water Treatment Works is situated close to the Lottering river and briefly consists of the following components:

- Raw water pumps
- Dosing point
- Settling tank / clarifier
- Slow sand filters
- Chlorine dosing equipment
- Storage facility

3.1.3. Storage Facilities

Coldstream village is currently served by a 120kl reservoir and the higher lying smallholdings by a 30kl elevated tank. Both reservoirs are situated at the Water Treatment Works.

3.1.4. Distribution

Water from the two supply reservoirs is transported via Ø 110mm uPVC and Ø 90mm uPVC pipelines respectively to their different supply zones. The distribution network consists of Ø 75mm and Ø 63mm uPVC pipelines and all the households have individual house connections.

3.2 SANITATION

Coldstream has a full waterborne sanitation system, with flushing toilets leading to a 300 kl/day packaged plant Waste Water Treatment Works which was recently constructed.

4.0 DISCUSSION AND CONCLUSION

A general sentiment of dissatisfaction regarding the quality of service delivery was shared amongst the community of Coldstream during the Public Participation Process. They were complaining about the abrupt changes in water quality and frequent sewerage pipe blockages. The capacities of both the Water and Waste Water Treatment Works are adequate to process the current loadings. The actual problem lies in the operation and maintenance of the respective systems due to a lack of adequate manpower. This matter needs to be addressed urgently.

The capacities of the bulk works however needs to be re-assessed since Council is in the process of planning to service another 300 low-income sites in the near future. Water meters (bulk & reticulation) must also be installed for the existing erven to improve Water Resource Management. The description and costs for implementation are shown in Section 12, Tables 1 and 2.



2. KOOMANSBOS

1. GENERAL

Refer to drawing no 189610QO/01.

Koomansbos is a small community situated approximately 1.5 km south of the N2 National Road and 70 km west of Humansdorp. The entire population of 64 households are below RDP standard for water and sanitation services.

2. POPULATION

The current population in the 64 formal houses in Koomansbos is estimated at approximately 384 residents, based on an average household size of 6 people per household. Based on a nominal population growth rate of 1,2% per annum (Kou Kamma IDP, 2003 revision), the projected population will be as follows :

PROJECTED AT A NOMINAL GROWTH RATE OF 1,2% PER ANNUM						
YEAR	2003	2004	2005	2006	2007	2008
POPULATION	384	390	395	400	405	410

3. EXISTING INFRASTRUCTURE

3.1 WATER SUPPLY

3.1.1. Sources

The entire community obtains water for household consumption from the Kruisrivier.

3.1.2. Water Treatment Works

No Water Treatment Works exists in Koomansbos.

3.1.3. Storage Facilities

No bulk storage facilities currently serve Koomansbos.

3.1.4. Distribution

No distribution network exists in Koomansbos.

3.2 SANITATION

Koomansbos has no waterborne sanitation system, and uses pit latrines.

4.0 DISCUSSION AND CONCLUSION

A general sentiment of dissatisfaction regarding the quality of service delivery was shared amongst the community of Koomansbos during the Public Participation Process. They were mostly complaining about the lack of adequate services. The actual problem lies in the lack of funds and adequate manpower.

It is proposed that raw water be pumped from the Elands River by means of a small pump station delivering to a basic water treatment works near to the community. The treatment process will consist of chemical coagulation in a flocculation tank followed by sedimentation and pressure filtration with disinfections by chlorination taking place just prior to being stored in a brickwork reservoir of approximately 40 kl in size. A reticulation to standpipes will supply the community.

Estimated capital cost

R1 500 000

3.4.3.2 Sanitation

It is proposed that 64 VIP units be installed.

Estimated capital cost

R 280 000

Total Estimated Capital Cost Koomansbos

R1 780 000

An alternative description and costs for implementation are shown in Section 12, Tables 1 and 2. No additional service provision is planned for Koomansbos.

3. STORMSRIVIER

1. GENERAL

Refer to drawing no 189610QO/01 and 189610QO/16.

Stormsrivier is a medium semi-rural township in the Tsitsikamma-area, approximately 22km south of Joubertina. The pristine natural beauty of the surrounding areas makes it an attractive tourist destination. Low-income housing is the predominant land-use pattern. The township also has the following facilities:

- schools
- crèches
- service centres
- 2 community halls
- sports field
- churches
- shops and general dealers

The town is divided into 2 distinctive suburbs, viz. Stormsrivier Village (medium to high income), which consists of approximately 100 residential erven, and Stormsrivier West (medium to low income) which consists of approximately 470 low-cost residential erven.

2. POPULATION

The current population in Stormsrivier is estimated at approximately 2 885 residents, based on an average household size of 3 people per household for Stormsrivier Village and 5.5 people per household for Stormsrivier West. Based on a nominal population growth rate of 1,2% per annum (Kou Kamma IDP, 2003 revision), the projected population will be as follows :

PROJECTED AT A NOMINAL GROWTH RATE OF 1,2% PER ANNUM						
YEAR	2003	2004	2005	2006	2007	2008
POPULATION	2 885	2 920	2 955	2 990	3 026	3 062

3. EXISTING INFRASTRUCTURE

3.1 WATER SUPPLY

3.1.1. Sources

Stormsrivier receives bulk water from a quarry, which serves as a storage dam, from where it is pumped via a Ø 160mm uPVC Class 9 pipeline to the small packaged Water Treatment Works.

3.1.2. Water Treatment Works

The plant consists of the following components (the capacity is unknown at this stage):

- Raw water pumps
- Dosing point
- Settling tank / clarifier
- Slow sand filters
- Chlorine dosing equipment
- Storage facility

3.1.3. Storage Facilities

Stormsrivier village is currently served by a 120kl reservoir and the higher lying smallholdings by a 30kl elevated tank. Both reservoirs are situated at the Water Treatment Works.

3.1.4. Distribution

Water from the two supply reservoirs is transported via Ø 110mm uPVC and Ø 90mm uPVC pipelines respectively to their different supply zones. The distribution network consists of Ø 75mm and Ø 63mm uPVC pipelines and all the households have individual house connections.

3.2 SANITATION

Stormsrivier Village uses septic tanks and Stormsrivier West has a full waterborne sanitation system, with flushing toilets leading to a 3000kl / day Waste Water Treatment Works, which was recently constructed.

4.0 DISCUSSION AND CONCLUSION

A general sentiment of dissatisfaction regarding the quality of service delivery was shared amongst the community of Stormsrivier during the Public Participation Process. They were complaining about the abrupt changes in water quality and frequent sewerage pipe blockages. The capacity of both the Water and Waste Water Treatment works are adequate to process the current loadings. The actual problem lies in the operation and maintenance of the respective systems due to a lack of adequate manpower. This matter needs to be addressed urgently.

Water meters (bulk & reticulation) must be installed for the existing erven to improve Water Resource Management. The description and costs for implementation are shown in Section 12, Tables 1 and 2.



4. GOESA

1. GENERAL

Refer to drawing no 189610QO/01.

Goesa is rural township consisting of 50 families and is situated in the Tsitsikamma-area, approximately 28km south of Joubertina alongside the N2 National Road.

2. POPULATION

The current population in the 50 formal houses in Goesa is estimated at approximately 275 residents, based on an average household size of 5.5 people per household. Based on a nominal population growth rate of 1,2% per annum (Kou Kamma IDP, 2003 revision), the projected population will be as follows :

		PROJECTED AT A NOMINAL GROWTH RATE OF 1,2% PER ANNUM					
YEAR	2003	2004	2005	2006	2007	2008	
POPULATION	275	280	285	290	295	300	

3. EXISTING INFRASTRUCTURE

3.1 WATER SUPPLY

3.1.1. Sources

The entire Goesa community obtains water from a borehole as well as the Wittekliprivier.

3.1.2. Water Treatment Works

No Water Treatment Works exists in Goesa. According to the reports referred to in the sections above, it is estimated that there is sufficient good quality groundwater available for small-scale localized abstractions. The groundwater is considered to be Class I and is therefore suitable for drinking.

3.1.3. Storage Facilities

No bulk storage facilities currently serve Goesa.

3.1.4. Distribution

The distribution network consists of Ø 75mm and Ø 63mm uPVC pipelines and all the households have individual house connections.

3.2 SANITATION

Goesa has a pit latrine sanitation system with no Waste Water Treatment Works.

4.0 DISCUSSION AND CONCLUSION

The description and costs for implementation of services augmentation for Goesa are shown in Section 12, Tables 1 and 2.

5. THORNHAM

1. GENERAL

Refer to drawing no 189610QO/01.

Thornham is a medium to small rural township in the Tsitsikamma-area, approximately 30km south-east of Joubertina. Low-income housing is the predominant land-use pattern. Agriculture and social grants are the main sources of income to the residents. The township also has the following facilities:

- 1 school
- 1 crèche
- 1 community hall
- sports field
- 1 church
- spaza shops and general dealers

The town consists of approximately 200 residential erven with gravel roads.

2. POPULATION

The current population in Thornham is estimated at approximately 1 100 residents, based on an average household size of 5.5 people per household. Based on a nominal population growth rate of 1,2% per annum (Kou Kamma IDP, 2003 revision), the projected population will be as follows :

		PROJECTED AT A NOMINAL GROWTH RATE OF 1,2% PER ANNUM					
YEAR	2003	2004	2005	2006	2007	2008	
POPULATION	1 100	1 115	1 130	1 145	1 160	1 175	

3. EXISTING INFRASTRUCTURE

3.1 WATER SUPPLY

3.1.1. Sources

Thornham receives bulk water from an on-site borehole, from where it is pumped into a concrete reservoir next to the borehole.

3.1.2. Water Treatment Works

No Water Treatment Works exists in Thornham. According to the reports, it is estimated that there is sufficient good quality groundwater available for small-scale localized abstractions. The groundwater is considered to be Class I and is therefore suitable for drinking.

3.1.3. Storage Facilities

Thornham village is currently served by a single concrete reservoir next to the borehole. The capacity of the reservoir is unknown at this stage, but the storage is sufficient according to the residents.

3.1.4. Distribution

The distribution network consists of Ø 75mm and Ø 63mm uPVC pipelines and all the households have individual house connections.

3.2 SANITATION

Thornham has an aqua-privy sanitation system and thus have no Waste Water Treatment Works.

4.0 DISCUSSION AND CONCLUSION

A general sentiment of dissatisfaction regarding the quality of service delivery was shared amongst the community of Thornham during the Public Participation Process. The actual problem lies in the operation and maintenance of the respective systems due to a lack of adequate manpower. This matter needs to be addressed urgently.

Water meters (bulk & reticulation) must be installed for the existing erven to improve Water Resource Management. The description and costs for implementation are shown in Section 12, Tables 1 and 2.

6. GRIQUA RUST

1. GENERAL

Refer to drawing no 189610QO/01.

Griqua Rust is a rural township consisting of 60 families and is situated adjacent to Sanddrif in the Tsitsikamma-area, approximately 28km south of Joubertina alongside the N2 National Road, and falls under the jurisdiction of the Tsitsikamma Development Trust.

2. POPULATION

The current population in the 60 formal houses in Griqua Rust is estimated at approximately 330 residents, based on an average household size of 5.5 people per household. Based on a nominal population growth rate of 1,2% per annum (Kou Kamma IDP, 2003 revision), the projected population will be as follows :

		PROJECTED AT A NOMINAL GROWTH RATE OF 1,2% PER ANNUM					
YEAR	2003	2004	2005	2006	2007	2008	
POPULATION	330	335	340	345	350	355	

3. EXISTING INFRASTRUCTURE

3.1 WATER SUPPLY

3.1.1. Sources

The entire community obtains purified water from Sanddrif.

3.1.2. Water Treatment Works

No Water Treatment Works exists in Griqua Rust since it obtains purified water from Sanddrif.

3.1.3. Storage Facilities

No bulk storage facilities currently serve Griqua Rust.

3.1.4. Distribution

The distribution network consists of Ø 75mm and Ø 63mm uPVC pipelines and all the households have individual house connections.

3.2 SANITATION

Griqua Rust has a septic tank / small bore sanitation system with no Waste Water Treatment Works.

4.0 DISCUSSION AND CONCLUSION

Water meters (bulk & reticulation) must be installed for the existing erven to improve Water Resource Management. The description and costs for implementation are shown in Section 12, Tables 1 and 2.

No additional service provision is planned for Griqua Rust.

7. SANDDRIF

1. GENERAL

Refer to drawing no 189610QO/01 and 189610QO/18.

Sanddrif is a medium semi-rural township in the Tsitsikamma-area, approximately 28km south of Joubertina, and situated alongside the N2 National Road approximately 72 km west of Humansdorp. The pristine natural beauty of the surrounding areas makes it an attractive tourist destination. Low-income housing is the predominant land-use pattern. The town also has the following facilities:

- schools
- crèches
- service centres
- 2 community halls
- sports field
- churches
- shops and general dealers

The town is divided into 2 distinctive suburbs, viz. Sanddrif Village (medium to high income), which consists of approximately 100 residential erven, and Nompumelelo (medium to low income), which consists of approximately 605 low-cost residential erven.

The final planning for a proposed new housing development of approximately 500 low-income residential erven and 200 medium-income residential erven is imminent.

2 POPULATION

The current population in Sanddrif is estimated at approximately 3 630 residents, based on an average household size of 3 people per household for Sanddrif Village and 5.5 people per household for Nompumelelo. With the planned new housing project of 500 low-income houses and 200 medium-income residential erven, the population is expected to boost due to the influx of people from surrounding areas to approximately 6 980 residents. Based on a nominal population growth rate of 1,2% per annum (Kou Kamma IDP, 2003 revision), the projected population will be as follows :

PROJECTED AT A NOMINAL GROWTH RATE OF 1,2% PER ANNUM						
YEAR	2003	2004	2005	2006	2007	2008
POPULATION	3 630	6 980	7 060	7 150	7 230	7 320

3 EXISTING INFRASTRUCTURE

3.1 WATER SUPPLY

3.1.1. Sources

Sanddrif receives bulk water from a mountain stream, from where it is diverted via a weir at the foot of the mountain and gravitates to the Water Treatment Works.

3.1.2. Water Treatment Works

The plant consists of the following components (the capacity is unknown at this stage):

- A weir
- Dosing point
- Settling tanks / clarifiers
- Rapid sand filters
- Chlorine dosing equipment
- Storage facilities

3.1.3. Storage Facilities

Sanddrif village is currently served by a 500kl reservoir and the higher lying smallholdings by a 30kl elevated tank. Both reservoirs are situated at the Water Treatment Works.

3.1.4. Distribution

Water from the two supply reservoirs is transported via Ø 110mm uPVC and Ø 90mm uPVC pipelines respectively to their different supply zones. The distribution network consists of Ø 75mm and Ø 63mm uPVC pipelines and all the households have individual house connections.

3.2 SANITATION

Sanddrif Village and Nompumelelo has a full waterborne sanitation system, with flushing toilets leading to a 3000kl / day Waste Water Treatment Works, which was recently constructed.

4.0 DISCUSSION AND CONCLUSION

A general sentiment of dissatisfaction regarding the quality of service delivery was shared amongst the community of Sanddrif during the Public Participation Process. They were complaining about the abrupt changes in water quality. The capacities of both the Water and Waste Water Treatment Works are adequate to process the current loadings. The actual problem lies in the operation and maintenance of the respective systems due to a lack of adequate manpower. This matter needs to be addressed urgently.

The capacities of the bulk works however needs to be re-assessed since Council is in the process of planning to service another 500 low-income sites and 200 medium-income residential erven in the near future. Water meters (bulk & reticulation) must be installed for the existing erven to improve Water Resource Management. The description and costs for implementation are shown in Section 12, Tables 1 and 2.



8. BLIKKIESDORP

1. GENERAL

Refer to drawing no 189610QO/01.

Blikkiesdorp is rural township adjacent to Sanddrif in the Tsitsikamma-area, approximately 28km south of Joubertina, and situated alongside the N2 National Road approximately 72 km west of Humansdorp, and consists of approximately 40 houses.

2. POPULATION

The current population in the 40 formal houses in Blikkiesdorp is estimated at approximately 220 residents, based on an average household size of 5.5 people per household. Based on a nominal population growth rate of 1,2% per annum (Kou Kamma IDP, 2003 revision), the projected population will be as follows :

		PROJECTED AT A NOMINAL GROWTH RATE OF 1,2% PER ANNUM					
YEAR	2003	2004	2005	2006	2007	2008	
POPULATION	220	225	230	235	240	245	

3. EXISTING INFRASTRUCTURE

3.1 WATER SUPPLY

3.1.1. Sources

The entire community obtains water from a borehole outside town.

3.1.2. Water Treatment Works

No Water Treatment Works exists in Blikkiesdorp. According to the reports referred to in the sections above, it is estimated that there is sufficient good quality groundwater available for small-scale localized abstractions. The groundwater is considered to be Class I and is therefore suitable for drinking.

3.1.3. Storage Facilities

No bulk storage facilities currently serve Blikkiesdorp since water from boreholes is pumped directly to the sites.

3.1.4. Distribution

The distribution network consists of Ø 75mm and Ø 63mm uPVC pipelines and all the households have individual house connections.

3.2 SANITATION

Blikkiesdorp has full waterborne sanitation system leading to The Sanddrif Waste Water Treatment Works.

4.0 DISCUSSION AND CONCLUSION

Water meters (bulk & reticulation) must be installed for the existing erven to improve Water Resource Management. The description and costs for implementation are shown in Section 12, Tables 1 and 2.

No additional service provision is planned for Blikkiesdorp.

9. KWAAIBRAND

1. GENERAL

Refer to drawing no 189610QO/01.

Kwaaibrand is an ex-forestry station situated approximately 23 km south of Kareedouw and lies about 3 km south of the N2 National Road next to Clarkson. Approximately 40 houses are situated on the farm, all of which are below RDP standard for water and sanitation services.

2. POPULATION

The current population in the 40 formal houses in Kwaaibrand is estimated at approximately 220 residents, based on an average household size of 5.5 people per household. Based on a nominal population growth rate of 1,2% per annum (Kou Kamma IDP, 2003 revision), the projected population will be as follows :

PROJECTED AT A NOMINAL GROWTH RATE OF 1,2% PER ANNUM						
YEAR	2003	2004	2005	2006	2007	2008
POPULATION	220	225	230	235	240	245

3. EXISTING INFRASTRUCTURE

3.1 WATER SUPPLY

3.1.1. Sources

The entire community obtains water from a borehole outside town.

3.1.2. Water Treatment Works

No Water Treatment Works exists in Kwaaibrand. According to the reports referred to in the sections above, it is estimated that there is sufficient good quality groundwater available for small-scale localized abstractions. The groundwater is considered to be Class I and is therefore suitable for drinking.

3.1.3. Storage Facilities

No bulk storage facilities currently serve Kwaaibrand since water from boreholes is pumped directly to the sites.

3.1.4. Distribution

No distribution network exists in Kwaaibrand.

3.2 SANITATION

Kwaaibrand has no waterborne sanitation system, and uses pit latrines.

4.0 DISCUSSION AND CONCLUSION

A general sentiment of dissatisfaction regarding the quality of service delivery was shared amongst the community of Kwaaibrand during the Public Participation Process. They were mostly complaining about the lack of adequate services. The actual problem lies in the lack of funds and adequate manpower.

Water meters (bulk & reticulation) must be installed for the existing erven to improve Water Resource Management. The description and costs for implementation are shown in Section 12, Tables 1 and 2.

No additional service provision is planned for Kwaaibrand.

10. WOODLANDS

1. GENERAL

Refer to drawing no 189610QO/01 and 189610QO/09.

Woodlands is a medium to small rural township in the Tsitsikamma-area, approximately 20km south-west of Kareedouw. Low-income housing is the predominant land-use pattern and forestry and farms surrounding the township, are the main source of employment and income to the residents. The township also has the following facilities:

- 1 school
- 1 crèche
- 1 service centre
- 1 community hall
- sports field
- churches
- shops and general dealers

The township consists of approximately 421 low-cost residential erven and the final planning for a proposed new housing development of approximately 300 residential erven is imminent.

2. POPULATION

The current population in Woodlands is estimated at approximately 2 320 residents, based on an average household size of 5.5 people per household. Based on a nominal population growth rate of 1,2% per annum (Kou Kamma IDP, 2003 revision), the projected population will be as follows :

PROJECTED AT A NOMINAL GROWTH RATE OF 1,2% PER ANNUM						
YEAR	2003	2004	2005	2006	2007	2008
POPULATION	2 320	2 350	2 380	2 400	2 430	2 460

3. EXISTING INFRASTRUCTURE

3.1 WATER SUPPLY

3.1.1. Sources

Woodlands receives bulk water from the Woodlands River which runs through the farm Woodlands Nr. 585. Water from the river is diverted via a weir into a storage dam, from where it is pumped via a Ø 160mm uPVC Class 9 pipeline to the small packaged Water Treatment Works.

3.1.2. Water Treatment Works

The Water Treatment Works is situated on the farm Palmiet River Nr. 584 on the eastern boundary, which is directly south of the N2 route.

The plant consists of the following components:

- Raw water pumps
- Dosing point
- Settling tank / clarifier
- Slow sand filters
- Chlorine dosing equipment
- Storage facility

3.1.3. Storage Facilities

Woodlands village is currently served by a 120kl reservoir and the higher lying smallholdings by a 30kl elevated tank. Both reservoirs are situated at the Water Treatment Works.

3.1.4. Distribution

Water from the two supply reservoirs is transported via Ø 110mm uPVC and Ø 90mm uPVC pipelines respectively to their different supply zones. The distribution network consists of Ø 75mm and Ø 63mm uPVC pipelines and all the households have individual house connections.

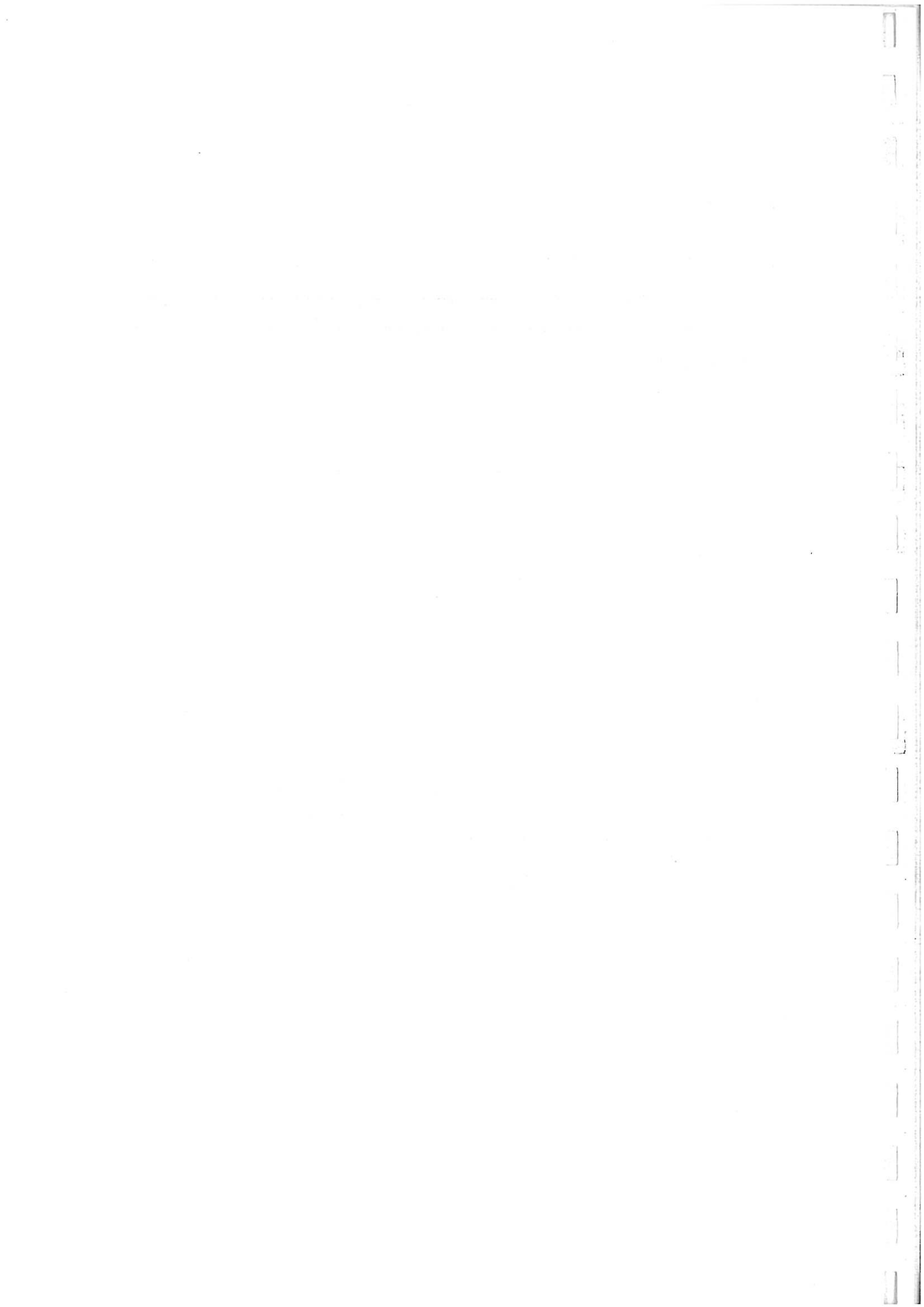
3.2 SANITATION

Woodlands has a full waterborne sanitation system, with flushing toilets leading to a 250kl / day Waste Water Treatment Works.

4.0 DISCUSSION AND CONCLUSION

A general sentiment of dissatisfaction regarding the quality of service delivery was shared amongst the community of Woodlands during the Public Participation Process. They were complaining about the abrupt changes in water quality and frequent sewerage pipe blockages. The capacity of both the Water and Waste Water Treatment Works is adequate to process the current loadings. The actual problem lies in the operation and maintenance of the respective systems due to a lack of adequate manpower. This matter needs to be addressed urgently.

The capacities of the bulk works however needs to be re-assessed since Council is in the process of planning to service another 300 low-income sites in the near future. The description and costs for implementation are shown in Section 12, Tables 1 and 2.



11. EERSTE RIVER

1. GENERAL

Refer to drawing no 189610QO/01.

Eerste River is a small community consisting of 57 households with 1 school situated near the small holiday resort of Eerste River Strand along the banks of the Eerste River. The community lies approximately 6 km south of the N2 National Road, and 90 km east of Plettenberg Bay. The entire population of approximately 342 people are below RDP standard for water and sanitation services.

The final planning for a proposed new housing development of approximately 200 low-income residential erven is imminent.

2. POPULATION

The current population in Eerste River is estimated at approximately 350 residents, based on an average household size of 6 people per household. With the planned new housing project of 200 low-income houses the population is expected to boost due to the influx of people from surrounding areas to approximately 1 450 residents. Based on a nominal population growth rate of 1,2% per annum (Kou Kamma IDP, 2003 revision), the projected population will be as follows :

PROJECTED AT A NOMINAL GROWTH RATE OF 1,2% PER ANNUM						
YEAR	2003	2004	2005	2006	2007	2008
POPULATION	350	1 450	1 460	1 480	1 500	1 520

3. EXISTING INFRASTRUCTURE

3.1 WATER SUPPLY

3.1.1. Sources

Eerste River receives bulk water from a borehole in town. Water from the borehole is pumped to 6 small storage tanks.

3.1.2. Water Treatment Works

No Water Treatment Works exists in Eerste River.

3.1.3. Storage Facilities

6 Storage tanks currently serve Eerste River village, of which 4 is in the schoolyard and 2 are in town.

3.1.4. Distribution

No distribution network exists and residents are served by standpipes which is directly fed by the storage tanks

3.2 SANITATION

Eerste River has no waterborne sanitation system, and uses pit latrines.

4.0 DISCUSSION AND CONCLUSION

A general sentiment of dissatisfaction regarding the quality of service delivery was shared amongst the community of Eerste River during the Public Participation Process. They were mostly complaining about the lack of adequate services. The actual problem lies in the lack of funds and adequate manpower. This matter will be addressed once the new 200 low-income houses are completed. The description and costs for implementation are shown in Section 12, Tables 1 and 2.

12. CLARKSON

1. GENERAL

Refer to drawing no 189610QO/01 and 189610QO/10.

Clarkson is a medium to small rural township in the Tsitsikamma-area, approximately 18km south of Kareedouw. Low-income housing is the predominant land-use pattern. Agriculture and social grants are the main sources of income to the residents. The township also has the following facilities:

- 2 schools
- 1 crèche
- 1 service centre
- 1 community hall
- sports field
- churches
- shops and general dealers

The town consists of approximately 694 residential erven with gravel roads.

2. POPULATION

The current population in Clarkson is estimated at approximately 4 860 residents, according to the Ward Councillor's recollection. Based on a nominal population growth rate of 1,2% per annum (Kou Kamma IDP, 2003 revision), the projected population will be as follows :

		PROJECTED AT A NOMINAL GROWTH RATE OF 1,2% PER ANNUM					
YEAR	2003	2004	2005	2006	2007	2008	
POPULATION	4 860	4 920	4 980	5 040	5 100	5 160	

3. EXISTING INFRASTRUCTURE

3.1 WATER SUPPLY

3.1.1. Sources

Clarkson receives bulk water from a storage dam in the mountains, from where it gravitates via a Ø 160mm uPVC Class 9 pipeline to the small packaged Water Treatment Works.

3.1.2. Water Treatment Works

The Water Treatment Works is situated next to the storage dam and consists of the following components:

- Raw water pumps
- Dosing point
- Settling tank / clarifier
- Slow sand filters
- Chlorine dosing equipment
- Storage facility

3.1.3. Storage Facilities

Clarkson village is currently served by a 120kl reservoir and the higher lying smallholdings by on site elevated storage tanks.

3.1.4. Distribution

Water from the supply reservoir is transported via Ø 110mm uPVC and Ø 90mm uPVC pipelines respectively to the different supply zones. The distribution network consists of Ø 75mm and Ø 63mm uPVC pipelines and all the households have individual house connections.

3.2 SANITATION

Clarkson has a full waterborne sanitation system, with flushing toilets leading to a 300kl / day Waste Water Treatment Works.

4.0 DISCUSSION AND CONCLUSION

A general sentiment of dissatisfaction regarding the quality of service delivery was shared amongst the community of Clarkson during the Public Participation Process. They were complaining about the abrupt changes in water quality and frequent sewerage pipe blockages. The capacities of both the Water and Waste Water Treatment Works are adequate to process the current loadings. The actual problem lies in the operation and maintenance of the respective systems due to a lack of adequate manpower. This matter needs to be addressed urgently.

Water meters (bulk & reticulation) must be installed for the existing erven to improve Water Resource Management. The description and costs for implementation are shown in Section 12, Tables 1 and 2.



13. WITTEKLEIBOS

1. GENERAL

Refer to drawing no 189610QO/01.

Wittekleibos is a small community of 50 families living on privately owned land falling under the jurisdiction of the Tsitsikamma Development Trust, and is situated approximately 116 km east of Plettenberg Bay and about 3 km south of the N2 National Road.

The town consists of approximately 65 residential erven with inter-connecting gravel roads.

2. POPULATION

The current population in Wittekleibos is estimated at approximately 440 residents, based on the Councillor's recollection. Based on a nominal population growth rate of 1,2% per annum (Kou Kamma IDP, 2003 revision), the projected population will be as follows :

		PROJECTED AT A NOMINAL GROWTH RATE OF 1,2% PER ANNUM					
YEAR	2003	2004	2005	2006	2007	2008	
POPULATION	440	445	450	455	460	465	

3. EXISTING INFRASTRUCTURE

3.1 WATER SUPPLY

3.1.1. Sources

Wittekleibos receives bulk water from a borehole. Water from the borehole is pumped directly into 3 storage tanks.

3.1.2. Water Treatment Works

No Water Treatment Works exists in Wittekleibos. According to the reports referred to in the sections above, it is estimated that there is sufficient good quality groundwater available for small-scale localized abstractions. The groundwater is considered to be Class I and is therefore suitable for drinking.

3.1.3. Storage Facilities

No bulk storage facilities currently serve Wittekleibos since water from boreholes is stored in on site concrete tanks.

3.1.4. Distribution

Residents are served by house connections, which is directly fed by the on site concrete tanks from boreholes.

3.2 SANITATION

Wittekleibos has no waterborne sanitation system, and uses pit latrines and septic tanks.

4.0 DISCUSSION AND CONCLUSION

The description and costs for implementation of services augmentation for Wittekleibos are shown in Section 12, Tables 1 and 2.

14. GUAVA JUICE

1. GENERAL

Refer to drawing no 189610QO/01.

Guava Juice is an agricultural village situated approximately 43 km west of Humansdorp and lies about 3 km south of the N2 National Road next to Clarkson. The Tsitsikamma Development Trust owns the farm on which approximately 40 houses are situated, all of whom are below RDP standard for water and sanitation services.

2. POPULATION

The current population in the 40 formal houses in Guava Juice is estimated at approximately 220 residents, based on an average household size of 5.5 people per household. Based on a nominal population growth rate of 1,2% per annum (Kou Kamma IDP, 2003 revision), the projected population will be as follows :

	PROJECTED AT A NOMINAL GROWTH RATE OF 1,2% PER ANNUM					
YEAR	2003	2004	2005	2006	2007	2008
POPULATION	220	225	230	235	240	245

3. EXISTING INFRASTRUCTURE

3.1 WATER SUPPLY

3.1.1. Sources

The entire community obtains water from a borehole outside town. The nearby Tsitsikamma River is considered to be the most suitable sustainable water source available.

3.1.2. Water Treatment Works

No Water Treatment Works exists in Guava Juice. According to the reports referred to in the sections above, it is estimated that there is sufficient good quality groundwater available for small-scale localized abstractions. The groundwater is considered to be Class I and is therefore suitable for drinking.

3.1.3. Storage Facilities

No bulk storage facilities currently serve Guava Juice since water from boreholes is pumped into water drums which are transported via trucks to the sites.

3.1.4. Distribution

No distribution network exists in Guava Juice.

3.2 SANITATION

Guava Juice has no waterborne sanitation system, and uses pit latrines.

4.0 DISCUSSION AND CONCLUSION

A general sentiment of dissatisfaction regarding the quality of service delivery was shared amongst the community of Misgund during the Public Participation Process. They were mostly complaining about the lack of adequate services. The actual problem lies in the lack of funds and adequate manpower. No additional service provision is planned for Guava Juice.

15. TWEE RIVIERE

1. GENERAL

Refer to drawing no 189610QO/01.

Twee Riviere is a farming district and is situated in the Baviaanskloof valley, approximately 45 km west of Joubertina. Twee Riviere is a farming community with families of farmers and farm labourers residing on privately owned farms.

The township also has the following facilities:

- 2 saw mills
- 1 garage
- 3 stores
- 1 community hall
- 1 mortuary
- 1 church
- 2 shops and 1 bottle store

The town consists of approximately 120 residential erven with inter-connecting gravel roads.

2. POPULATION

The current population in Twee Riviere is estimated at approximately 660 residents, based on an average household size of 5.5 people per household. Based on a nominal population growth rate of 1,2% per annum (Kou Kamma IDP, 2003 revision), the projected population will be as follows :

		PROJECTED AT A NOMINAL GROWTH RATE OF 1,2% PER ANNUM					
YEAR	2003	2004	2005	2006	2007	2008	
POPULATION	660	670	680	690	700	710	

3. EXISTING INFRASTRUCTURE

3.1 WATER SUPPLY

3.1.1. Sources

Twee Riviere receives bulk water from a river and boreholes. Water from the borehole is pumped directly into the distribution network.

3.1.2. Water Treatment Works

No Water Treatment Works exists in Twee Riviere. According to the reports referred to in the sections above, it is estimated that there is sufficient good quality groundwater available for small-scale localized abstractions. The groundwater is considered to be Class I and is therefore suitable for drinking.

3.1.3. Storage Facilities

No bulk storage facilities currently serve Twee Riviere since water from boreholes is stored in on site concrete tanks.

3.1.4. Distribution

Residents are served by house connections, which is directly fed by the on site concrete tanks from boreholes.

3.2 SANITATION

Twee Riviere has no waterborne sanitation system, and uses pit latrines and septic tanks.

4.0 DISCUSSION AND CONCLUSION

The description and costs for implementation of services augmentation for Twee Riviere are shown in Section 12, Tables 1 and 2.

16. KRAKEEL RIVER

1. GENERAL

Refer to drawing no 189610QO/01 and 189610QO/11.

Krakeel River is a small rural township situated in the Langkloof Valley and is approximately 15 km west of Joubertina on the R61 route. The predominant land-use pattern is residential, accompanied by the following:

- 1 school
- a clinic
- 1 crèche
- 2 cemeteries
- 1 community hall
- 3 public open spaces
- shops and general dealers

The township consists of approximately 187 residential erven and the final planning for a proposed new housing development of approximately 200 residential erven is imminent.

The township originated as a residential facility for farm workers of the surrounding farms. Storage sheds, small retention dams, orchards and compounds are commonly found in and around this agricultural township.

2. POPULATION

The current population in Krakeel River is estimated at 2 140 residents, according to the Ward Councillor. Based on a nominal population growth rate of 1,2% per annum (Kou Kamma IDP, 2003 revision), the projected population will be as follows :

		PROJECTED AT A NOMINAL GROWTH RATE OF 1,2% PER ANNUM					
YEAR	2003	2004	2005	2006	2007	2008	
POPULATION	2 140	2 160	2 190	2 220	2 240	2 270	

3. EXISTING INFRASTRUCTURE

3.1 WATER SUPPLY

3.1.1. Sources

Krakeel River receives bulk water from a borehole and two fountains, which are situated at the toe of the mountain to the south of town. Water from the sources is transported via a concrete distribution channel and pipeline to a 550kℓ reservoir for distribution. The fountains however, are not sustainable and have dried up in the past during dry seasons.

3.1.2. Water Treatment Works

Water from the sources gravitates via the concrete distribution channel to a sump, from where it is pumped directly to the 550kℓ storage reservoir for distribution. No Water Treatment Works exists in this township.

3.1.3. Storage Facilities

Bulk water is stored in a 550kℓ concrete reservoir at 643 msl. The TWL is 645,95 msl with a freeboard of 300 mm and a 180 mm roof slab for covering.

3.1.4. Distribution

The concrete distribution channel transporting water from the sources is 900 mm wide x 470 mm deep. The flow in this channel varies between 12 ℓ/s and 100 ℓ/s. Water for household consumption abstracted from this channel is based on a water turn every 10 days for 2,5 hours at a time. The water abstracted from the channel is transported respectively via a 225 mm ø and 100 mm ø pipeline to the sump from where it is pumped via a ø 90 mm uPVC class 9 rising main to the 550kℓ reservoir at a rate of approximately 3 ℓ/s, for distribution.

3.2 SANITATION

The community of Krakeel River relies on shallow pit latrines and septic tanks for basic sanitation. Some of the erven are equipped with flushing toilets, but it is not in use yet since no infrastructure for a waterborne reticulation system is in place. The issue around sustainable water supply needs to be addressed and implemented prior to the consideration of implementing a full waterborne sewerage system including a Waste Water Treatment Works.

4.0 DISCUSSION AND CONCLUSION

The augmentation of bulk water supply to Krakeel River has been addressed, and will be phased as follows :

- Phase 1 – Augmentation of Water Supply by means of drilling 2 new boreholes (one operational at a yield of at least 1 ℓ/s and equipped with new pump and rising main, and the other for monitoring purposes)

The approved budget for this phase is R1 260 000 (2003/2004 financial year).

- Phase II – Additional augmentation of water supply by drilling and equipping at least one more borehole. Telemetry switching is to be installed to control the pump switching with the water levels in the sump. The existing sump also needs to be demolished and replaced.

The approved budget for this phase is R1 482 000 (2004/2005 financial year)

- Phase III – Water Treatment Plant – R2 500 000



17. LOUTERWATER

1. GENERAL

Refer to drawing no 189610QO/01 and 189610QO/12.

Louterwater is a medium, semi-rural farming community in the Langkloof-area, approximately 25km west of Joubertina. Medium to low-income housing is the predominant land-use pattern. The township also has the following facilities:

- 1 school
- 1 crèche
- service centres
- 1 community centre
- sports field
- churches
- shops and general dealers
- a quarry and rock outcrop

The town is divided into 2 distinctive suburbs, viz. Old Louterwater & Farm Pond (medium to high income), which consists of approximately 180 residential erven, and Louterwater Township (Klipdrift - medium to low income), which consists of approximately 270 low-cost residential erven.

The final planning for a proposed new housing development of approximately 230 low-income residential erven is imminent.

2. POPULATION

The current population in Louterwater is estimated at approximately 2 025 residents, based on an average household size of 3 people per household for Old Louterwater & Farm Pond and 5.5 people per household for Louterwater Township (Klipdrift). With the planned new housing project of 230 low-income, the population is expected to boost due to the influx of people from surrounding areas to approximately 3 290 residents. Based on a nominal population growth rate of 1,2% per annum (Kou Kamma IDP, 2003 revision), the projected population will be as follows :

PROJECTED AT A NOMINAL GROWTH RATE OF 1,2% PER ANNUM						
YEAR	2003	2004	2005	2006	2007	2008
POPULATION	2 025	3 290	3 330	3 410	3 450	3490

3. EXISTING INFRASTRUCTURE

3.1 WATER SUPPLY

3.1.1. Sources

Louterwater receives bulk water from a mountain stream, which gets diverted via a weir to a storage dam in town, from where it is pumped, after purification via a Ø 150mm pipeline to a 500kl supply reservoir.

3.1.2. Water Treatment Works

The plant consists of the following components:

- Raw water pumps
- Dosing point
- Settling tank / clarifier
- Slow sand filters
- Chlorine dosing equipment
- Storage facility

3.1.3. Storage Facilities

Louterwater is currently entirely served by a 500kl reservoir, which is constructed with masonry and a sink roof, south-west of town.

3.1.4. Distribution

Water from the supply reservoir is transported via Ø 110mm uPVC and Ø 90mm uPVC pipelines respectively to the different supply zones. The distribution network consists of Ø 75mm and Ø 63mm uPVC pipelines and all the households have individual house connections.

3.2 SANITATION

Old Louterwater & Farm Pond uses septic tanks and Louterwater Township (Klipdrift) has a full waterborne sanitation system, with flushing toilets leading to an oxidation pond system north of town.

4.0 DISCUSSION AND CONCLUSION

A general sentiment of satisfaction regarding the quality of service delivery was shared amongst the community of Louterwater during the Public Participation Process.

Water meters (bulk & reticulation) must be installed for the existing erven to improve Water Resource Management. Only general maintenance is needed for this town, and the description and costs for implementation are shown in Section 12, Tables 1 and 2.



18. MISGUND

1. GENERAL

Refer to drawing no 189610QO/01 and drawing no 189610QO/13.

Misgund is a farming district and is situated approximately 35 km west of Joubertina in the Baviaanskloof. The total population is 1 950. Approximately 1 750 residents lives in a formalised township and the remaining 200 residents are scattered on privately owned farms. Low-income housing is the predominant land-use pattern. Agriculture and social grants is the main sources of income to the residents. The township also has the following facilities:

- 1 school
- 1 garage
- 1 bank
- 4 stores
- 1 community hall
- 1 post office
- 2 churches
- shops and general dealers

The town consists of approximately 350 residential erven with gravel roads. The final planning for a proposed new housing development of approximately 400 low-income residential erven is imminent.

2. POPULATION

The current population in Misgund is estimated at approximately 1 950 residents, based on an average household size of 5.5 people per household. With the planned new housing project of 400 low-income houses the population is expected to boost due to the influx of people from surrounding areas to approximately 4 150 residents. Based on a nominal population growth rate of 1,2% per annum (Kou Kamma IDP, 2003 revision), the projected population will be as follows :

		PROJECTED AT A NOMINAL GROWTH RATE OF 1,2% PER ANNUM					
YEAR	2003	2004	2005	2006	2007	2008	
POPULATION	1 950	4 150	4 200	4 250	4 300	4 350	

3. EXISTING INFRASTRUCTURE

3.1 WATER SUPPLY

3.1.1. Sources

Misgund receives bulk water from a river and a borehole in town. Water from the borehole is pumped directly into the distribution network.

3.1.2. Water Treatment Works

No Water Treatment Works exists in Misgund.

3.1.3. Storage Facilities

No storage facilities currently serve Misgund.

3.1.4. Distribution

Residents are served by yard taps, which is directly fed by the borehole.

3.2 SANITATION

Misgund has no waterborne sanitation system, and uses pit latrines and septic tanks.

4.0 DISCUSSION AND CONCLUSION

A general sentiment of dissatisfaction regarding the quality of service delivery was shared amongst the community of Misgund during the Public Participation Process. They were mostly complaining about the lack of adequate services. The actual problem lies in the lack of funds and adequate manpower. This matter will be addressed once the new 400 low-income houses are completed. The description and costs for implementation are shown in Section 12, Tables 1 and 2.

SECTIONS 9 - 12

KOU KAMMA MUNICIPALITY

SECTIONS 9 - 12

KOU YAMMA MUNICIPALITY

9. WATER SERVICES INSTITUTIONAL ARRANGEMENTS PROFILE

In order to address the WSDP goals and service level targets the municipality needs to ensure that:

- a) it is able to effectively fulfil the **water services authority (WSA)** responsibilities as outlined in the Water Services Act (internal management and regulatory arrangements);
- b) efficient and effective **water services provider institutional arrangements** are in place (bulk WSPs, retail WSPs and support services agents)

The water services authority is the municipality that has been assigned WSA functions. It is accountable and responsible for ensuring that water services are provided to consumers. However, this does not mean that it has to provide the services itself. It, or other water services providers can provide the services. If the WSA decides to appoint a water services provider to fulfil the water services provision function, it will enter into a municipal services partnership (MSP) through signing a contract with a bulk and/or retail water services provider.

WSA responsibilities

Whilst the Water Services Act does not require the WSDP to contain details about the municipality's capacity to fulfil WSA functions, various components within the WSDP are dependent upon these functions being effectively fulfilled. For this reason, a section is included to highlight functions that are critical to the WSDP process.

9.1 WSA functions and outputs

The table below outlines major functions and outputs to fulfil the WSA role and responsibilities. Some items may not be applicable in which case the 'not applicable' (N/A) column should be ticked. For items that apply to all WSAs, the N/A column is shaded grey. If the municipality envisages that it will need support to establish the necessary functions and outputs, this should be indicated.

WSA functions / outputs	In place? (yes/ no)	N/A	If no, when will it be in place?	Support required (yes/no)
Policy development				
Indigent policy	YES			NO
Free basic water policy (including equitable share)	YES			NO
Procurement policy	YES			NO
Regulation and tariffs				
Water services bylaws with conditions as required by the Water Services Act	YES			NO
Mechanisms to ensure compliance with bylaws	YES			NO
Tariff structure	YES			NO
Tariffs promulgated	YES			NO
Infrastructure development (projects)				
Mechanisms to undertake project feasibility studies	YES			NO
Criteria for prioritising projects	YES			NO
Mechanisms to assess and approve project business plans	YES			NO
Mechanisms for selecting, contracting, managing and monitoring implementing agents	YES			YES
Mechanisms to monitor project implementation	YES			YES
Water conservation and demand management				
Water conservation and demand management strategy	NO		2004	YES
Performance management and monitoring				
Performance management system	YES			YES
Water service monitoring and evaluation (M&E) system	NO		2003/4	YES
WSDP				
WSDP information system	NO		2003/4	YES
Mechanisms for stakeholder participation	NO		2003/4	YES
Mechanisms to monitor and report on WSDP implementation	NO		2003/4	YES
WSP institutional arrangements				
Criteria to select appropriate WSPs	NO		2003/4	YES
Mechanisms to contract, manage and monitor WSPs	NO		2003/4	YES
Mechanisms to approve WSP business plans	NO		2003/4	YES
WSA overall capacity				
Sufficient staff and systems to fulfil all WSA functions	NO		2003/4	YES

9.2 WSA capacity development

The project list at the end of the WSDP makes provision for projects to address WSA capacity in year 1. In the table below indicate those WSA functions which are priorities in terms of capacity development.

WSA priorities for capacity development	Capacity needs assessment conducted (yes/no)	Formal skills training required (yes/no)	Proposed timeframe for capacity development	Estimated cost
Piping of Water Furrow + Rising Main to 3 Krone Farms - Kareedouw	Yes	Yes	7 months	25 000
Bulk Water supply – Koomansbos	Yes	Yes	5 months	15 000
Water treatment plant (Phase II and III) – Joubertina	Yes	Yes	7 months	20 000
Bulk Water supply (Phase I) – Krakeelrivier	Yes	Yes	6 months	40 000
Krakeelrivier WWTW	Yes	Yes	10 months	50 000
Misgund WWTW	Yes	Yes	6 months	20 000

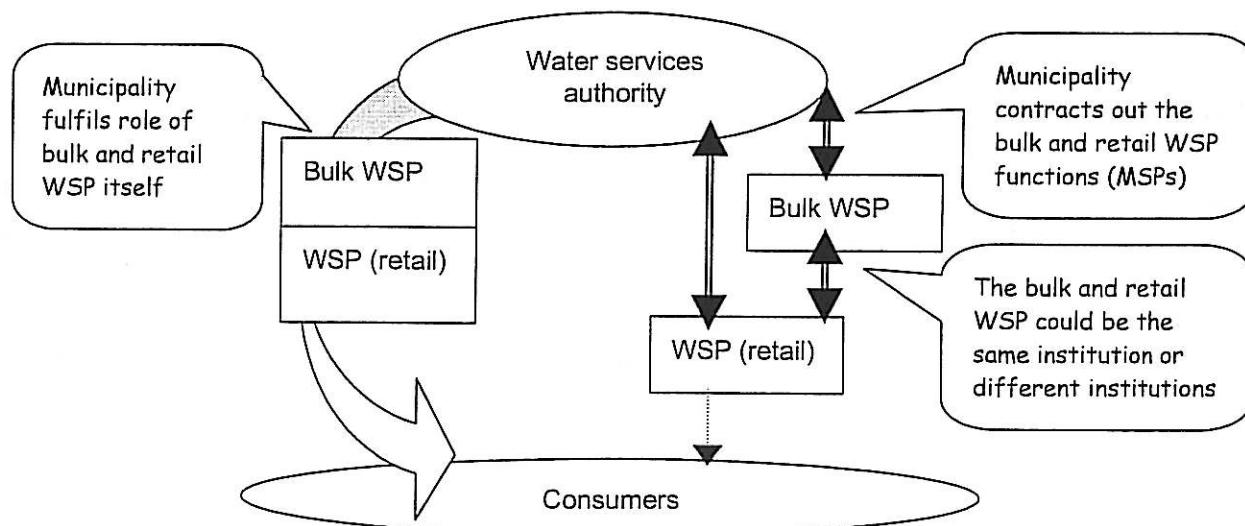
9.3 Bylaws affecting water services

ID	Bylaw Name	Short description	Criteria	Effect on water services
NONE	N/A	N/A	N/A	N/A

Water services provider (WSP) institutional arrangements

WSP institutional arrangements refers to the bulk and retail WSP functions. The figure below illustrates the municipality fulfilling both the bulk and retail WSP functions (on the left hand side) and municipal service partnerships (MSPs) with bulk and retail WSPs (on the right hand side).

Figure: WSP institutional arrangements



Note: there are many different options in establishing WSP institutional arrangements. For example the municipality could contract out the bulk WSP function and fulfil the retail WSP function itself. In addition the municipality could act as WSP for some areas and contract other WSPs for other areas. These arrangements will depend on specific context of the WSA area of jurisdiction.

If the WSA decides to fulfil the water services provision function itself, it may fulfil the function through an internal unit or it may corporatise the function through creating a municipal company. It may also decide to outsource parts of the water services provider function, for example meter reading, billing, etc. through service contracts. In this case the WSA remains the WSP with the assistance of service contracts.

Retail water services providers

The retail WSP function includes the following:

- daily operations and repairs
- preventative and major maintenance
- customer relations, health and hygiene awareness and communication
- revenue collection and related financial management
- reporting and providing information on the provision of services
- general administration of the water services

A WSP may be contracted to fulfil some or all of these functions.

There are a number of different types of WSPs which could fulfil the WSP retail functions, including district and local municipalities, a water board (they are typically associated with bulk water supply, but in some areas also provide retail services), private companies, and community based organisations (CBOs), such as a village water committee.

Some WSPs may require access to support, for example a community based water services provider or other small water services providers. The WSA may provide the support itself, or it may contract a support services agent (SSA) to provide support such as institutional and social development (ISD) mentoring, maintenance support or sanitation promotion.

9.4 Water services providers (retail water) – current year

It is important to indicate who the current water services providers are for different settlements / areas, as well as to indicate the type of water services provider, for example district municipality, local municipality, water board, private sector, community based organisation, or joint venture between different types of WSPs. If the WSP is not the municipality (i.e. the WSA), it must be stated whether a signed contract is in place or not and the type of contract (e.g. service contract, management contract, lease, service contract, etc. The percentage of consumers (within the WSA area of jurisdiction) that are served by the different WSPs should also be indicated.

Contract Area	Settlement type (urban / rural)	Name of water services provider (WSP)	Type of WSP	Signed contract (yes/no)	Type of contract	% consumers served by the WSP
1. Coldstream	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
2. Koomansbos	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
3. Stormsrivier	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
4. Goesa	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
5. Thornham	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
6. Griqua Rust	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
7. Sanddrif	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
8. Blikkiesdorp	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
9. Kwaaibrand	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
10. Woodlands	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
11. Eersterivier	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
12. Clarkson	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
13. Wittekleibos	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
14. Kareedouw	Urban	Kou Kamma Mun.	Municipality	NO	N/A	100%
15. Guava juice	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
16. Twee riviere	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%

17. Joubertina	Urban	Kou Kamma Mun.	Municipality	NO	N/A	100%
18. Krakeelrivier	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
19. Louterwater	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
20. Misgund / Proefplaas	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
Area with no WSP	Settlement type (urban / rural)	Name of water services provider (WSP)	Type of WSP	Signed contract (yes/no)	Type of contract	% consumers with no WSP
1. NONE	N/A					N/A
2.						
3.						
4.						

Future WSP institutional arrangements

Once the current situation has been determined, the WSA should decide on what types of WSP institutional arrangements it aims to have in the future to ensure efficient, affordable, economical and sustainable water services. This will depend on a range of issues such as:

- the particular settlement type (as different institutions are suited to different contexts);
- location and accessibility of the community to be served;
- capacity of the municipality to provide services itself;
- capacity of the municipality to monitor and regulate WSPs should it decide to contract WSPs
- suitability of other WSPs to provide the services (cost, acceptability to the community/ies concerned, etc.)

All consumers should be covered by a WSP within five years. If this cannot be achieved, reasons should be given in the text that accompanies the table.

9.5 Water services providers (retail water) – year 5

The same settlements should be reported on as for the current year, plus those settlements that are currently not served but will be served within the next five years. The future WSP and proposed type of contract should also be indicated. If it is unclear who specifically will fulfil the WSP role, the type of WSP should be identified. If the WSP institutional arrangements for any settlements or areas are to remain the same, then the same WSP information should be reported, together with the contract type that is envisaged by year 5. It is assumed that within 5 years contracts will be in place with all WSPs. If it is anticipated that there will not be contracts in place with some of the WSPs, the reasons for this should be reported on in the text that accompanies the table below.

Contract area:	Settlement type (urban / rural)	Name of water services provider (WSP)	Type of WSP	Type of contract	% consumers served by the WSP
1. Coldstream	Rural	Kou Kamma Mun.	Municipality	N/A	100%
2. Koomansbos	Rural	Kou Kamma Mun.	Municipality	N/A	100%
3. Stormsrivier	Rural	Kou Kamma Mun.	Municipality	N/A	100%
4. Goesa	Rural	Kou Kamma Mun.	Municipality	N/A	100%
5. Thornham	Rural	Kou Kamma Mun.	Municipality	N/A	100%
6. Griqua Rust	Rural	Kou Kamma Mun.	Municipality	N/A	100%
7. Sanddrif	Rural	Kou Kamma Mun.	Municipality	N/A	100%
8. Blikkiesdorp	Rural	Kou Kamma Mun.	Municipality	N/A	100%
9. Kwaaibrand	Rural	Kou Kamma Mun.	Municipality	N/A	100%
10. Woodlands	Rural	Kou Kamma Mun.	Municipality	N/A	100%
11. Eersterivier	Rural	Kou Kamma Mun.	Municipality	N/A	100%
12. Clarkson	Rural	Kou Kamma Mun.	Municipality	N/A	100%
13. Wittekleibos	Rural	Kou Kamma Mun.	Municipality	N/A	100%
14. Kareedouw	Urban	Kou Kamma Mun.	Municipality	N/A	100%
15. Guava juice	Rural	Kou Kamma Mun.	Municipality	N/A	100%
16. Twee riviere	Rural	Kou Kamma Mun.	Municipality	N/A	100%
17. Joubertina	Urban	Kou Kamma Mun.	Municipality	N/A	100%
18. Krakeelrivier	Rural	Kou Kamma Mun.	Municipality	N/A	100%
19. Louterwater	Rural	Kou Kamma Mun.	Municipality	N/A	100%
20. Misgund / Proefplaas	Rural	Kou Kamma Mun.	Municipality	N/A	100%
Total % consumers with WSPs with signed contracts					100
Total % consumers with WSPs with no contracts					0

Area with no WSP	Settlement type (urban / rural)	Reason why no WSP	% consumers with no WSP
1. None	N/A	N/A	N/A
2.			
3.			
4.			
Total % consumers with no WSPs			0

Supporting text: provide reasons if:

- there are any settlements that will not have a WSP in place within the next five years
- it is anticipated that contracts will not be in place with any WSPs who are currently or will be providing water services within the next 5 years.

9.6 Water services providers (sanitation) – current year

In this section it is only necessary to report on those areas that are not served by a bulk sanitation WSP.

Contract area:	Settlement type (urban / rural)	Name of water services provider (WSP)	Type of WSP	Signed contract (yes/no)	Type of contract	% consumers served by the WSP
1. Coldstream	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
2. Koomansbos	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
3. Stormsrivier	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
4. Goesa	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
5. Thornham	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
6. Griqua Rust	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
7. Sanddrif	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
8. Blikkiesdorp	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
9. Kwaaibrand	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
10. Woodlands	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
11. Eersterivier	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
12. Clarkson	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
13. Wittekleibos	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%

14. Kareedouw	Urban	Kou Kamma Mun.	Municipality	NO	N/A	100%
15. Guava juice	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
16. Twee riviere	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
17. Joubertina	Urban	Kou Kamma Mun.	Municipality	NO	N/A	100%
18. Krakeelrivier	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
19. Louterwater	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
20. Misgund / Proefplaas	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
Area with no WSP	Settlement type (urban / rural)	Name of water services provider (WSP)	Type of WSP	Signed contract (yes/no)	Type of contract	% consumers with no WSP
1. None	N/A					N/A
2.						

9.7 Water services providers (sanitation) – year 5

Contract area:	Settlement type (urban / rural)	Name of water services provider (WSP)	Type of WSP	Type of contract	% consumers served by the WSP
1. Coldstream	Rural	Kou Kamma Mun.	Municipality	N/A	100%
2. Koomansbos	Rural	Kou Kamma Mun.	Municipality	N/A	100%
3. Stormsrivier	Rural	Kou Kamma Mun.	Municipality	N/A	100%
4. Goesa	Rural	Kou Kamma Mun.	Municipality	N/A	100%
5. Thornham	Rural	Kou Kamma Mun.	Municipality	N/A	100%
6. Griqua Rust	Rural	Kou Kamma Mun.	Municipality	N/A	100%
7. Sanddrif	Rural	Kou Kamma Mun.	Municipality	N/A	100%
8. Blikkiesdorp	Rural	Kou Kamma Mun.	Municipality	N/A	100%
9. Kwaaibrand	Rural	Kou Kamma Mun.	Municipality	N/A	100%
10. Woodlands	Rural	Kou Kamma Mun.	Municipality	N/A	100%

11. Eersterivier	Rural	Kou Kamma Mun.	Municipality	N/A	100%
12. Clarkson	Rural	Kou Kamma Mun.	Municipality	N/A	100%
13. Wittekleibos	Rural	Kou Kamma Mun.	Municipality	N/A	100%
14. Kareedouw	Urban	Kou Kamma Mun.	Municipality	N/A	100%
15. Guava juice	Rural	Kou Kamma Mun.	Municipality	N/A	100%
16. Twee riviere	Rural	Kou Kamma Mun.	Municipality	N/A	100%
17. Joubertina	Urban	Kou Kamma Mun.	Municipality	N/A	100%
18. Krakeelrivier	Rural	Kou Kamma Mun.	Municipality	N/A	100%
19. Louterwater	Rural	Kou Kamma Mun.	Municipality	N/A	100%
20. Misgund / Proefplaas	Rural	Kou Kamma Mun.	Municipality	N/A	100%
Total % consumers with WSPs with signed contracts					100%
Total % consumers with WSPs with no contracts					0
Area with no WSP	Settlement type (urban / rural)	Reason why no WSP			% consumers with no WSP
1. None	N/A	N/A			N/A
2.					
Total % consumers with no WSPs					0

9.8 Water services providers (bulk water) – current

On the water supply side there are three bulk water services provider categories:

- A separate bulk WSP is appointed which sells bulk water to (retail) water services providers.
- The bulk service is provided by the same organisation as that which provides the retail service.
- No bulk water services are involved (for example where a community gets water from a borehole).

If bulk water services are required, the bulk WSP to each community needs to be identified. The percentage consumers who do not require bulk water services should also be reported.

Contract area:	Settlement type (urban / rural)	Name of bulk WSP	Type of bulk WSP	Signed contract (yes/no)	Type of contract	% consumers served by the bulk WSP
1. Coldstream	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
2. Koomansbos	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
3. Stormsrivier	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
4. Goesa	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
5. Thornham	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
6. Griqua Rust	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
7. Sanddrif	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
8. Blikkiesdorp	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
9. Kwaaibrand	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
10. Woodlands	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
11. Eersterivier	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
12. Clarkson	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
13. Wittekleibos	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
14. Kareedouw	Urban	Kou Kamma Mun.	Municipality	NO	N/A	100%
15. Guava juice	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
16. Twee riviere	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
17. Joubertina	Urban	Kou Kamma Mun.	Municipality	NO	N/A	100%
18. Krakeelrivier	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
19. Louterwater	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
20. Misgund / Proefplaas	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
Percentage consumers who require bulk water services but with no bulk WSP						0%
Percentage consumers who do not require a bulk WSP						100%

9.9 Water services provider (bulk water) – year 5

Contract area:	Settlement type (urban / rural)	Name of bulk WSP	Type of bulk WSP	Type of contract	% consumers served by the bulk WSP
1. Coldstream	Rural	Kou Kamma Mun.	Municipality	N/A	100%
2. Koomansbos	Rural	Kou Kamma Mun.	Municipality	N/A	100%
3. Stormsrivier	Rural	Kou Kamma Mun.	Municipality	N/A	100%
4. Goesa	Rural	Kou Kamma Mun.	Municipality	N/A	100%
5. Thornham	Rural	Kou Kamma Mun.	Municipality	N/A	100%
6. Griqua Rust	Rural	Kou Kamma Mun.	Municipality	N/A	100%
7. Sanddrif	Rural	Kou Kamma Mun.	Municipality	N/A	100%
8. Blikkiesdorp	Rural	Kou Kamma Mun.	Municipality	N/A	100%
9. Kwaaibrand	Rural	Kou Kamma Mun.	Municipality	N/A	100%
10. Woodlands	Rural	Kou Kamma Mun.	Municipality	N/A	100%
11. Eersterivier	Rural	Kou Kamma Mun.	Municipality	N/A	100%
12. Clarkson	Rural	Kou Kamma Mun.	Municipality	N/A	100%
13. Wittekleibos	Rural	Kou Kamma Mun.	Municipality	N/A	100%
14. Kareedouw	Urban	Kou Kamma Mun.	Municipality	N/A	100%
15. Guava juice	Rural	Kou Kamma Mun.	Municipality	N/A	100%
16. Twee riviere	Rural	Kou Kamma Mun.	Municipality	N/A	100%
17. Joubertina	Urban	Kou Kamma Mun.	Municipality	N/A	100%
18. Krakeelrivier	Rural	Kou Kamma Mun.	Municipality	N/A	100%
19. Louterwater	Rural	Kou Kamma Mun.	Municipality	N/A	100%
20. Misgund / Proefplaas	Rural	Kou Kamma Mun.	Municipality	N/A	100%
Percentage consumers who require bulk water services but with no bulk WSP					0%
Percentage consumers who do not require a bulk WSP					100%

9.10 Water services providers (bulk sanitation) – current

Contract area:	Settlement type (urban / rural)	Name of bulk sanitation WSP	Type of bulk sanitation WSP	Signed contract (yes/no)	Type of contract	% consumers served by the bulk sanitation WSP
1. Coldstream	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
2. Koomansbos	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
3. Stormsrivier	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
4. Goesa	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
5. Thornham	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
6. Griqua Rust	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
7. Sanddrif	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
8. Blikkiesdorp	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
9. Kwaaibrand	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
10. Woodlands	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
11. Eersterivier	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
12. Clarkson	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
13. Wittekleibos	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
14. Kareedouw	Urban	Kou Kamma Mun.	Municipality	NO	N/A	100%
15. Guava juice	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
16. Twee riviere	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
17. Joubertina	Urban	Kou Kamma Mun.	Municipality	NO	N/A	100%
18. Krakeelrivier	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
19. Louterwater	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
20. Misgund / Proefplaas	Rural	Kou Kamma Mun.	Municipality	NO	N/A	100%
Percentage consumers who require bulk sanitation services but with no bulk sanitation WSP						0%
Percentage consumers who do not require a bulk sanitation WSP						100%

9.11 Water services provider (bulk sanitation) – year 5

Contract area:	Settlement type (urban / rural)	Name of bulk sanitation WSP	Type of bulk sanitation WSP	Type of contract	% consumers served by the bulk sanitation WSP
1. Coldstream	Rural	Kou Kamma Mun.	Municipality	N/A	100%
2. Koomansbos	Rural	Kou Kamma Mun.	Municipality	N/A	100%
3. Stormsrivier	Rural	Kou Kamma Mun.	Municipality	N/A	100%
4. Goesa	Rural	Kou Kamma Mun.	Municipality	N/A	100%
5. Thornham	Rural	Kou Kamma Mun.	Municipality	N/A	100%
6. Griqua Rust	Rural	Kou Kamma Mun.	Municipality	N/A	100%
7. Sanddrif	Rural	Kou Kamma Mun.	Municipality	N/A	100%
8. Blikkiesdorp	Rural	Kou Kamma Mun.	Municipality	N/A	100%
9. Kwaaibrand	Rural	Kou Kamma Mun.	Municipality	N/A	100%
10. Woodlands	Rural	Kou Kamma Mun.	Municipality	N/A	100%
11. Eersterivier	Rural	Kou Kamma Mun.	Municipality	N/A	100%
12. Clarkson	Rural	Kou Kamma Mun.	Municipality	N/A	100%
13. Wittekleibos	Rural	Kou Kamma Mun.	Municipality	N/A	100%
14. Kareedouw	Urban	Kou Kamma Mun.	Municipality	N/A	100%
15. Guava juice	Rural	Kou Kamma Mun.	Municipality	N/A	100%
16. Twee riviere	Rural	Kou Kamma Mun.	Municipality	N/A	100%
17. Joubertina	Urban	Kou Kamma Mun.	Municipality	N/A	100%
18. Krakeelrivier	Rural	Kou Kamma Mun.	Municipality	N/A	100%
19. Louterwater	Rural	Kou Kamma Mun.	Municipality	N/A	100%
20. Misgund / Proefplaas	Rural	Kou Kamma Mun.	Municipality	N/A	100%
Percentage consumers who require bulk sanitation services but with no bulk sanitation WSP					0%
Percentage consumers who do not require a bulk sanitation WSP					100%

9.12 Support services agents (water) – current

As outlined above, smaller WSPs may require support services in order to effectively fulfil the WSP function. Those settlements or areas that are serviced by a WSP that is supported by a SSA should be reported on this section. In addition, the type of support services should be reported, for example maintenance support, institutional support, financial mentoring support, etc. If there are settlements or areas with a WSP who requires a SSA, but does not have an SSA, these should also be reported on.

Contract area:	Settlement type (urban / rural)	Name of SSA	Type of SSA	Type of support services	Signed contract (yes/no)	% consumers served by WSP with SSA
1. NONE	N/A	N/A	N/A	N/A	N/A	N/A
2.						
3.						
4.						
Total percentage consumers with SSA						
Areas which require a SSA but with no SSA	Settlement type (urban / rural)					% consumers with no SSA
N/A	N/A					N/A
1.						
Total percentage consumers where a SSA is required but with no SSA						N/A

9.13 Support services agent (water) – year 5

Arrangements with support services agents may change within the next five years. The WSP may have developed sufficient capacity to fulfil the WSP functions without a SSA. Alternatively, the municipality may take over the SSA function itself. The envisaged SSA arrangements for year 5 should be reported in the table below.

	Settlement type (urban / rural)	Name of SSA	Type of SSA	Type of support services	% consumers served by WSP with SSA
1. NONE	N/A	N/A	N/A	N/A	N/A
2.					
3.					
Total percentage consumers with SSA					
Areas which require a SSA but with no SSA	Settlement type (urban / rural)	Reason why no SSA			% consumers with no SSA
1. NONE	N/A	N/A			N/A
2.					
3.					
Total percentage consumers where a SSA is required but with no SSA					N/A

9.14 Sanitation promotion agent – current

Sanitation promotion and health and hygiene awareness may be provided by the municipality itself or by a sanitation promotion agent (SPA).

Contract area:	Settlement type (urban / rural)	Name of Sanitation Promotion Agent (SPA)	Type of SPA	Type of sanitation promotion services	Signed contract (yes/no)	% consumers served by SPA
1. None	N/A	N/A	N/A	N/A	N/A	N/A
Total percentage consumers with SPA						
Areas which require a SPA but with no SPA	Settlement type (urban / rural)					% consumers with no SPA
1. None	N/A					N/A
Total percentage consumers where a SPA is required but with no SPA						

9.15 Sanitation promotion agent – year 5

Contract area:	Settlement type (urban / rural)	Name of SPA	Type of SPA	Type of support services	% consumers served by SPA
1. None	N/A	N/A	N/A	N/A	N/A
2.					
3.					
Total percentage consumers with SPA					
Areas which require a SPA but with no SPA	Settlement type (urban / rural)	Reason why no SPA			% consumers with no SPA
1. None	N/A	N/A			N/A
2.					
3.					
Total percentage consumers where a SPA is required but with no SPA					N/A

9.16 Support service contracts - current

'Contracting out' through service contracts relates to the outsourcing of specific functions rather than the full responsibility for running the service as a water services provider. Service contracts tend to be for a three to five year duration. Examples include service contracts for billing, meter reading, groundwater monitoring, etc.

WSP functions for which the municipality has service contracts:	Duration of contract
None	N/A

9.17 WSP staffing levels: Water and Sanitation

The organograms in Annexure B indicates the proposed staffing levels attending to Water and Sanitation services in the Kou Kamma Municipal Area.

9.18 WSP training programmes

Given the importance of building capacity, and the role which training plays, the WSDP needs to include information on training as it relates to the provision of water services. Both accredited training programmes and non-accredited training should to be identified, together with the number of person days of training per year provided for, over a five-year period.

Training programmes	Person days						
	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
Accredited training							
Finance and Admin	1	1	3	3	4	4	4
Projects and Planning	0	0	2	2	2	3	3
Operations	0	0	2	2	2	3	3
Distributions	0	0	4	4	4	5	5
Total person days	0	0	11	11	12	15	15
Non-accredited training							
Maintenance	0	0	6	6	7	7	8
Customer Services	0	0	3	3	4	4	4
Total person days	0	0	9	9	11	11	12

10 CUSTOMER SERVICES PROFILE

Consumers' experience of the delivery of water services is not restricted to what level of service they receive, but includes the quality of service rendered. If consumers are satisfied with the quality of service, they are more likely to be prepared to pay for the services they receive.

On the water supply side, quality of service includes: water quality, service continuity, complaint response time, meter coverage, billing, and access to pay points. On the sanitation side, quality of service is about response times to complaints.

While figures need to be reported for both urban and rural areas, it is accepted that the quality of service in rural areas is unlikely to be the same as in urban areas. However it is important that efforts are made to improve the quality of service in rural areas. The figures to be reported on refer to all categories of user (i.e. household, industrial, commercial and other).

10.1 Quality of service for water: urban

Various key areas are used to ensure that an adequate quality of service is delivered as reflected in the table below.

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Total no. of consumers	6 558	6 658	6 738	6 819	6 900	6 983	7 068
2. No. of consumers experiencing greater than 7 days interruption in supply per year	2 500	2 400	2 000	1 500	1 000	500	200
3. No. of consumers receiving flow rate of less than 10 litres per minute	0	0	0	0	0	0	0
4. Water quality: no chlorination	0	0	0	0	0	0	0
5. Water quality: chlorinated	6 558	6 658	6 738	6 819	6 900	6 983	7 068
6. Water quality: full treatment	6 558	6 658	6 738	6 819	6 900	6 983	7 068

10.2 Quality of service for water: rural

Refer to WSDP 3 (Kou Kamma Rural Areas) for this Sub Section.

10.3 Attending to complaints for water: urban

This section measures how effective the municipality or other WSPs are in terms of responding to and addressing complaints related to water provision.

WSAs might question the validity of asking for targets with regard to row (4) below. However, it is important that targets be reported so that there is clear point at which to aim in order to improve the quality of service.

	Prior 1	Current	Target Year 1	Target Year 2	Target Year 3	Target Year 4	Target Year 5
1. Total number of consumer units*	2 397	3 697	3 697	3 697	3 697	3 697	3 697
2. No. complaints of quality of service per year divided by total number of consumer units	0.37	0.35	0.31	0.28	0.16	0.06	0
3. Number of queries received within the year	143	139	124	74	50	31	19
4. % queries responded to within 24 hours	30	40	50	60	70	80	100
5. Number of major or visible leaks reported within the year	11	10	9	7	6	3	0
6. % major or visible leaks repaired within 48 hours after being reported.	50	54	60	80	100	100	100

*SOURCE: KOU KAMMA MUNICIPALITY, 2003

10.4 Attending to complaints for water: rural

Refer to WSDP 3 (Kou Kamma Rural Areas) for this Sub Section.

10.5 Attending to complaints for sanitation: urban

Key areas in terms of attending to sanitation complaints are the times for both responding to and fixing problems associated with sanitation systems.

	Prior 1	Current	Target Year 1	Target Year 2	Target Year 3	Target Year 4	Target Year 5
Discharge to treatment works	2 397	3 697	3 697	3 697	3 697	3 697	3 697
1. Number of queries/ complaints received within the year	143	139	124	74	50	31	19
2. % queries responded to within 24 hours	10	13	20	40	65	80	90
3. Number of blockages reported within the year	40	33	25	20	15	10	5
4. % blockages repaired within 48 hours after being reported	10	13	20	40	65	90	100
5. No. complaints per year divided by total number of consumer units	0.25	0.20	0.16	0.12	0.09	0.06	0.03
Pit/tank pumping							
6. Number of pits/ tanks	0	0	0	.0	0	0	0
7. Number of calls received within the year for emptying	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8. Number of calls received within the year for emergency maintenance to pits/ tanks	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Attending to complaints for sanitation: rural

Refer to WSDP 3 (Kou Kamma Rural Areas) for this Sub Section.

Educational and awareness programmes

Basic services must include an education component. Many water and sanitation projects carried out by municipalities have lacked this important aspect in the past and this needs to be addressed.

"Experience both within the country and internationally has shown that the most successful sanitation initiatives have been those in which emphasis was placed on generating a high level of health and hygiene awareness rather than producing a large number of latrines. Health and hygiene education and awareness creation not only provides the community with the tool to improve their environment and to change their behaviour, but it also provides the motivation and the understanding for people to prioritise sanitation as a need and hence be able to contribute towards the provision of sanitation facilities to enhance their own lives." (NASCO, 2000).

Education programmes could include information on:

- Sanitation promotion;
- Sources of water pollution (e.g. sewage with specific reference to downstream users of rivers and groundwater sources);
- Dangers of people using water from polluted rivers, boreholes or wells;
- Waterborne diseases;
- Health and hygiene awareness including initiatives to reduce waterborne diseases, such as hand washing;
- The need to conserve water and use it efficiently.

There are a number of different methods in which these messages can be distributed and thought should be given to which groups will be targeted, possible health messages, communication methods, roles of different institutions, time frames, who will carry it out and how skills will be transferred. These methods include:

- Public meetings
- Printed information disseminated (e.g. pamphlets)
- Radio/newspaper slots
- Household visits by health officers
- Participatory workshops

WSAs are required to report their education activities for basic water services according to the following table.

10.6 Education for basic water services

No. consumer units to be targeted by:	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Sanitation promotion and health and hygiene awareness	0	0	2 397	3 697	3 697	3 697	3 697
2. Water education (including water conservation)	0	0	2 397	3 697	3 697	3 697	3 697

The Municipality should plan to embark on a program to reduce the amount of unaccounted for water. Numerous causes, such as reticulation leaks, unmetered consumption, administration errors and faulty meters can be assessed which will result in a drastic reduction of unaccounted for water.

The Municipality currently prohibits deliberate wastage of water and restrictions on the hosing down of paved areas and irrigation of lawns and fields between 10h00 and 16h00 during peak dry seasons were also introduced. The following table summarises previous, current and future causes and projected amounts of unaccounted for water :

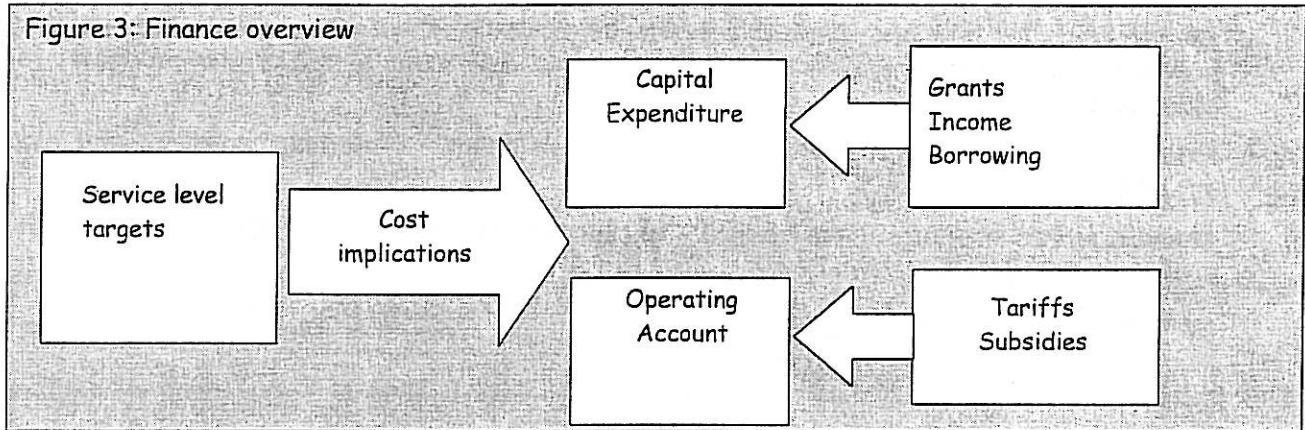
10.7 Pollution awareness

1. Does the WSA have a pollution awareness programme?	Yes	No X
2. If no, when will such a programme be in place?	2003/2004	

Various projects regarding the cleaning of rivers, removal of alien vegetation and rehabilitation of wetlands were endorsed by DWAF in the Kou Kamma Municipal area. The results were two-fold, since it enhanced the environment and jobs were also created.

11 FINANCIAL PROFILE

This part of the planning process is critical to the final WSDP. By identifying the costs associated with service level targets and the sources to meet the costs, the WSA will be able to see how financially viable their plan is.



As mentioned earlier service level targets are what drive costs. On the one hand there are capital costs which refers to how much it is going to cost to install the infrastructure. The section on capital expenditure requires the costs of infrastructure to be recorded according to a number of different categories. The section on capital income requires that the sources of finance to meet capital expenditure be recorded both in terms of subsidies, consumer payments, money from the WSA's current income and amounts to be borrowed.

Once the infrastructure has been built, there are ongoing operating costs. If the projected operating costs associated with capital expenditure are not factored in right from the start (i.e. when service levels are being considered), there is a danger that the WSA will not be able to afford the running costs of the services. Detailed operating costs are not required as part of the tables, however key information on the operating account is requested. This information gives an indication of how "healthy" the WSA's finances are.

Income for operating costs comes from user payments (through tariffs) and subsidies (equitable share). The section on operating income requires information on current and future tariffs. Future tariffs are important since they provide an indication of the costs to users for the services set out in the targets.

Whilst income and expenditure will be calculated for the different settlement types, the tables require that the amounts are consolidated for the WSA area as a whole.

It also needs to be noted that costs can only be calculated once the necessary water services policies are in place, for example Free Basic Water Policy, indigent policy, and policies regarding the use of equitable share and other subsidies.

11.1 Capital expenditure: water (R'000)

Based on the service level targets and the associated infrastructure requirements, capital expenditure were calculated.

For internal infrastructure (reticulation), capital costs were estimated on a per consumer unit basis for the different levels of service. This needs to be done for newly serviced consumer units and for upgrading existing consumer units.

Capital costs for bulk and connector services (connector main, reservoirs, pump stations, bulk main, treatment and water source) were also estimated based on the proposals for extending these services.

Finally capital costs were estimated for the rehabilitation of internal, connector and bulk infrastructure.

These figures were totalled for each of the different categories for urban (U) and rural (R) areas according to the tables below.

	Current		Year 1		Year 2		Year 3		Year 4		Year 5	
	U	R	U	R	U	R	U	R	U	R	U	R
1. Internal infrastructure	300	0	300	835	300	735	520	1 820	640	2 500	0	931
2. Connector infrastructure	0	0	0	605	0	535	785	1 520	1 100	2 420	73	2 530
3. Bulk infrastructure	1 720	1 700	400	4 975	975	4 800	750	1 675	200	1 000	2 500	2 120
4. Other	-	-	-	-	-	-	-	-	-	-	-	-
5. Total (1+2+3+4)	2 020	1 700	700	6 415	1 275	6 070	2 055	5 015	1 940	5 920	2 573	5 581
6. Cost per connection (item 5 divided by number of new connections being provided)	546-00	460-00	190-00	1 735-00	345-00	1 640-00	555-00	1 355-00	525-00	1 600-00	696-00	1 510-00

11.2 Capital expenditure: sanitation (R'000)

	Current		Year 1		Year 2		Year 3		Year 4		Year 5	
	U	R	U	R	U	R	U	R	U	R	U	R
1. Internal infrastructure	0	0	0	790	0	0	0	0	0	0	0	0
2. Connector infrastructure	0	0	0	0	0	1 000	600	1 000	0	0	0	0
3. Bulk infrastructure	0	0	0	4 150	0	5 750	900	3 370	900	2 350	0	1 790
4. Other	-	-	-	-	-	-	-	-	-	-	-	-
5. Total (1+2+3+4)	0	0	0	4 940	0	6 750	1 500	4 370	900	2 350	0	1 790
6. Cost per connection (item 5 divided by number of new connections being provided)	0	0	0	1 336-00	0	1 825-00	405-00	1 180-00	245-00	635-00	0	485-00

Sources of capital income

Once the total costs have been calculated, sources of income need to be found otherwise the planned projects remain a "wish list". Sources of finance for infrastructure are referred to as **capital income**.

There is a number of different capital financing options available to municipalities for water services. Most municipalities rely heavily on national subsidies or district municipal funding from their levy income. Sources can be divided into the categories described in the table below.

Category	Type of income
Grant funding from national government	<ul style="list-style-type: none"> ▪ Consolidated municipal infrastructure programme (CMIP). ▪ Community water supply and sanitation programme (CWSS). ▪ Housing subsidies. ▪ Other national programmes (e.g. Department of Land Affairs and Public Works)

Category	Type of income
Capital grant funding from other sources	<ul style="list-style-type: none"> ▪ Mvula Trust ▪ Donors ▪ Water boards
Funding available from local government itself	<ul style="list-style-type: none"> ▪ District WSA funds (raised through levy income). ▪ Local authority capital development funds (although on a limited scale given the financial position of many local municipalities).
Loan finance	<ul style="list-style-type: none"> ▪ Loans from private banks and the DBSA
Consumer contributions	<ul style="list-style-type: none"> ▪ This refers to money paid by consumers who are to benefit from a scheme. For example government may subsidise 70 percent of the costs, with households being responsibility for the remaining 30 percent.
Ad hoc private sector sources	<ul style="list-style-type: none"> ▪ Depending on the particular context, there might be additional sources of finance from the private sector.

It should be noted that there are proposals being considered by Cabinet to introduce a single infrastructure capital grant.

11.3 Sources of capital income: water

Sources for capital income need to be reported in the tables below. The totals in tables 11.3 and 11.4 must be reflected in tables 11.19 and 11.20.

	Current	Year 1	Year 2	Year 3	Year 4	Year 5
Subsidies						
1. CMIP (R'000)	1 500	-	-	-	-	-
2. DBSA (R'000)	220	-	-	-	-	-
3. CMIP/ DWAF (R'000)	0	3 370	3 095	1 710	1 840	2 553
4. CMIP/ MAAP (R'000)	300	300	850	1 085	1 500	2 500
5. MAAP (R'000)	0	580	1 385	1 775	2 520	1 376
6. CMIP/ DHLG (R'000)	1 050	2 865	2 015	2 500	2 000	1 725
7. Sub-total: subsidies (R'000)	3 070	7 115	7 345	7 070	7 860	8 154
Other income						
8. Other ad hoc grants which may become available (R'000)	-	-	-	-	-	-
9. Consumer payments (R'000)	650	TBD	TBD	TBD	TBD	TBD
10. Expenditure from current income	TBD	TBD	TBD	TBD	TBD	TBD
11. Sub-total (8 + 9 + 10): (R'000)	650	TBD	TBD	TBD	TBD	TBD
Loans						
12. Capital development fund (R'000)	-	-	-	-	-	-
13. External (R'000)	-	-	-	-	-	-
14. Sub-total: loans (R'000)	-	-	-	-	-	-
15. Total (7 + 11 + 14) (R'000)	3 720	7 115	7 345	7 070	7 860	8 154

11.4 Sources of capital income: sanitation

	Current	Year 1	Year 2	Year 3	Year 4	Year 5
Subsidies						
1. CMIP/ DWAF (R'000)	0	3 250	2 750	3 140	2 150	790
2. CMIP/ KKM (R'000)	0	0	0	150	0	0
3. CMIP/ DHLG (R'000)	0	900	3 000	2 000	1 100	1 000
4. DHLG (R'000)	0	790	1 000	580	0	0
5. Sub-total: subsidies (R'000)	0	4 940	6 750	5 870	3 250	1 790
Other income						
6. Other ad hoc grants which may become available (R'000)	0	0	0	0	0	0
7. Consumer payments (R'000) (MAAP)	0	0	0	0	0	0
8. Expenditure from current income	0	0	0	0	0	0
9. Sub-total (6 + 7 + 8): (R'000)	0	0	0	0	0	0
Loans						
10. Capital development fund (R'000)	0	0	0	0	0	0
11. External (R'000)	0	0	0	0	0	0
12. Sub-total: loans (R'000)	0	0	0	0	0	0
13. Total (5 + 9 + 12) (R'000)	0	4 940	6 750	5 870	3 250	1 790

Operating Costs

Projections of operating costs are required, based on the proposed programme and proposed institutional arrangements. It is assumed that the tariffs will be uniform across the municipal area and thus there is no separation between urban and rural. The following steps can be followed to calculate operating costs.

Step 1: The first step is to allocate the existing operating costs to consumer units to get a per-consumer-unit operating cost that will vary with the level of service provided. Various methods are available, from very simple to fairly complex. A relatively simple method is used in the water supply services model. More complex methods are contained in the WRC guidelines.

Step 2: The next step is to predict future costs per consumer unit for the different types of consumers. Costs per unit may change due to increases or decreases in the efficiency of service provision, and/or if input costs rise relative to the general inflation rate. For example, the cost per unit of bulk water purchased may increase in real terms. Future costs will also depend on future levels of consumption.

Step 3: The final step is to calculate total operating costs. This is a function of the estimated unit costs and the projected numbers of consumer units in each category.

While detailed operating costs are not required, key summary figures (used as indicators) are required. These are requested so that DWAF can understand whether the service level targets are viable or not.

11.5 Operating costs: water (R'000)

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. *Purchase of bulk water	-	-	-	TBD	TBD	TBD	TBD
2. *Production costs (raw water if from own sources)	-	-	-	TBD	TBD	TBD	TBD
3. *Production costs (treatment system)	-	-	-	TBD	TBD	TBD	TBD
4. *Operating costs (including overheads, salaries and wages, maintenance and depreciation)	-	-	-	TBD	TBD	TBD	TBD
5. *Finance charges	-	-	-	TBD	TBD	TBD	TBD
6. *Other	-	-	-	TBD	TBD	TBD	TBD
7. Total costs (1 + 2 + 3 + 4 + 5 + 6)	1 118	1 814	2 039	TBD	TBD	TBD	TBD
8. Operating costs per consumer unit				TBD	TBD	TBD	TBD

* NOTE : SEPARATE FIGURES WERE NOT AVAILABLE FOR THESE ITEMS

11.6 Operating costs: sanitation (R'000)

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. *Treatment costs	-	-	-	TBD	TBD	TBD	TBD
2. *Operating costs (including overheads, salaries and wages, monitoring, maintenance and depreciation)	-	-	-	TBD	TBD	TBD	TBD
3. *Finance charges	-	-	-	TBD	TBD	TBD	TBD
4. *Other	-	-	-	TBD	TBD	TBD	TBD
5. Total costs (1 + 2 + 3 + 4)	836	2 433	3 319	TBD	TBD	TBD	TBD
6. Operating costs per consumer unit	226-00	658-00	898-00	TBD	TBD	TBD	TBD

* NOTE : SEPARATE FIGURES WERE NOT AVAILABLE FOR THESE ITEMS

11.7 Operating income: subsidies

The main subsidy available for funding the operating costs of services is the equitable share. This is an unconditional grant from national to local government and the amount allocated is based on the levels of poverty within the particular municipal area. Equitable share is currently being phased in. Once it is fully phased in, the amount allocated per household earning less than R800 per month will be in the order of R85 per month. The WSA will have to decide how it will spend this subsidy and how much of it is to be spent on water. It is strongly recommended that part of this subsidy be used to cover the running costs of supplying a basic level of supply to poor households. This should be based on an indigents policy which requires that poor households be identified and the conditions of subsidisation be clearly spelt out.

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Equitable share allocation (R'000)	0	2 1123	2 517	TBD	TBD	TBD	TBD
2. % Equitable Share allocated to basic water supply	0	18	19	TBD	TBD	TBD	TBD
3. % Equitable Share allocated to basic sanitation provided	0	28	34	TBD	TBD	TBD	TBD
4. % of other subsidies allocated to basic water supply	0	0	0	0	0	0	0
5. % of other subsidies allocated to basic sanitation provision	0	0	0	0	0	0	0

The Municipality is currently busy to establish the allocations for water and sanitation from their equitable share.

11.8 Operating income: tariffs

The WSA needs to have an income or tariff policy stating from where it will raise recurrent income, how tariffs are to be set for different consumer groups and levels of service, and actual tariff levels. This should include a policy to provide free water for those who cannot afford a basic level of supply.

Further, it is important to project trends in tariffs as this is the key constraint to be applied to water services providers. Methodologies are available for doing this, for example the water supply and sanitation services models.

The tariff set by the WSA must:

- support the viability and sustainability of water services to the poor;
- discourage wasteful or inefficient water use;
- take into account the incremental cost that would be incurred to increase capacity of the water supply infrastructure to meet an incremental growth in demand.

Tariffs often comprise both a fixed charge and a variable charge based on consumption. The WSA's tariffs should be reported according to the following tables.

11.9 Fixed charges: residential (per month) for water

Please note that in the case of free basic water supply, the amounts may be zero.

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Communal water supply	-	-	-	-	-	-	-
2. Controlled volume supply	-	-	-	-	-	-	-
3. Uncontrolled volume supply	20-61	21-93	23-57	24-89	26-21	27-53	28-85

11.10 Fixed charges: residential (per month) for sanitation

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Consumer installations: VIP or equivalent	25-83	27-08	29-11	30-36	31-61	32-86	34-11
2. Consumer installations: Wet (septic tanks etc.) per removal	65-79	42-10	45-26	48-42	51-58	54-74	57-90
3. Discharge to water treatment works (intermediate or full waterborne)	38-89	41-23	44-32	47-41	50-50	53-60	56-69

11.11 Volume charges or other charge mechanisms: residential sanitation

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Consumer installations: VIP or equivalent	-	-	-	-	-	-	-
2. Consumer installations: Wet (septic tanks etc.) up to 5 000 litres (per removal after hours - residential)	114-04	63-16	67-90	97-74	102-48	107-22	111-96
3. Consumer installations: Wet (septic tanks etc.) up to 5 000 litres (per removal – other than residential)	117-54	127-19	136-73	136-84	146-38	155-92	165-46
4. Discharge to water treatment works (intermediate or full waterborne)	12-50	14-00	15-50	16-50	17-50	18-50	19-50

11.12 Block tariffs: residential (cents/kl) for water

Service Level	Block	Block definition	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
Communal Water Supply	1(a) Free Basic Water	0-6 kl	0	0	0	0	0	0	0
	1(b) Not Free Basic Water *	Stand pipe	0	0	0	0	0	0	0
Controlled Volume Supply	1(a) Free Basic Water	N/A	-	-	-	-	-	-	-
	1(b) Not Free Basic Water*	N/A	-	-	-	-	-	-	-
	2	N/A	-	-	-	-	-	-	-
	3	N/A	-	-	-	-	-	-	-
Uncontrolled Volume Supply	1(a) Free Basic Water	0-6 kl	0	0	0	0	0	0	0
	1(b) Not Free Basic Water *	6 - 10 kl	1-86	1-95	2-10	2-15	2-20	2-25	2-30
	2	11-20 kl	1-80	2-00	2-15	2-20	2-25	2-30	2-35
	3	21> kl	1-84	2-10	2-26	2-35	2-40	2-45	2-50
	6 Basic Charge	Domestic	21-93	23-57	25-21	26-85	28-49	30-13	31-77
	7 Basic Charge	Commercial	42-98	42-98	43-50	44-00	44-50	45-00	45-50
	8 Basic Charge	Shops/offices	3-86	4-15	4-44	4-73	5-02	5-31	5-60

* Not relevant if free basic water is provided to all

It is strongly suggested that the first block to residential consumers be set to provide the first six kilolitres per month for free. This implies that either the equitable share is used to cover this cost, or higher consumption blocks are charged at a rate greater than the cost in order to generate a surplus to cross-subsidise consumers who use up to six kilolitres per month. The WSA must include a description as to how they will address this in such a way that sustainable services can be provided. This should include the costs of supplying each block (i.e. cost versus charge). This implies that:

- the first block costs more to provide than is being charged for, and
- the higher consumption blocks cost less to provide than is being charged for.

11.13 Subsidy targeting approach for free basic water

Subsidy targeting approach	Percentage of households targeted
1. Rising block tariff	60%
2. Service level targeting	30%
3. Credits to water account	10%
4. Other	0%

Fixed charges and block tariffs: industrial for water

Industrial tariffs are not separated out into as much detail as for residential. Provision is made for up to three volume based charges.

	Block definition	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Fixed monthly charge	Basic Charge	233-33	250-83	268-33	285-83	303-33	320-83	338-33
2. Volume charge	R/kl above 21kl	2-10	2-26	2-32	2-48	2-64	2-80	2-96

11.14 Fixed charges and block tariffs: industrial for wastewater

	Block definition	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Fixed monthly charge	Any site	41-22	44-32	47-41	50-51	53-60	56-69	59-78
2. Volume charge	Per 100 m ³	201-75	216-88	232-01	247-14	262-27	277-40	292-53

11.15 Fixed charges and block tariffs: commercial for water

	Block definition	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Fixed monthly charge	Basic	48-25	52-00	55-75	59-50	63-25	67-00	70-75
2. Volume charge	R/kl above 21kl	2-10	2-26	2-32	2-48	2-64	2-80	2-96

11.16 Fixed charges and block tariffs: commercial for wastewater

	Block definition	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Fixed monthly charge	Up to 3 toilets	44-96	48-33	51-70	55-07	58-45	61-82	65-19
2. Volume charge	3 Toilets+	159-65	171-62	183-59	195-56	207-53	219-50	231-47

11.17 Fixed charges and block tariffs: other for water

	Block definition	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Fixed monthly charge	Basic	48-25	52-00	55-75	59-50	63-25	67-00	70-75
3. Volume charge	R/kl above 21kl	2-10	2-26	2-32	2-48	2-64	2-80	2-96

11.18 Fixed charges and block tariffs: other for sanitation

	Block definition	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Fixed monthly charge	Up to 3 toilets	44-96	48-33	51-70	55-07	58-45	61-82	65-19
2. Volume charge	3 Toilets+	159-65	171-62	183-59	195-56	207-53	219-50	231-47

11.19 Total income (and non-payment) and expenditure: water

Non-payment is currently having a profound effect on the provision of water services. The WSA will need to determine the key factors causing non-payment and measures to address these factors. This needs to be done with reference to the section on affordability.

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Total income (billed income and subsidies)	UNKNOWN	R 5 585 100	R 9 639 330	R 10 626 629	R 11 336 117	R 13 405 953	R 15 363 738
2. Actual income received	R 1 470 093	R 1 865 100	R 2 524 330	R 3 281 629	R 4 266 117	R 5 545 953	R 7 209 738
3. % non-payment	70%	70%	70%	60%	50%	30%	10%
4. Non-payment by residential consumers	70%	70%	70%	60%	50%	30%	10%
5. Non-payment by commercial consumers	70%	70%	70%	60%	50%	30%	10%

6. Non-payment by industrial consumers	70%	70%	70%	60%	50%	30%	10%
7. Non-payment by other consumers	70%	70%	70%	60%	50%	30%	10%
8. Total non-payment (4+5+6+7)	70%	70%	70%	60%	50%	30%	10%
9. Operating expenditure	R 1 117 825	R 1 814 113	R 2 039 290	R 2 284 005	R 2 558 085	2 865 055	R 3 208 862
10. Capital expenditure	UNKNOWN	R 3 720 000	R 7 115 000	R 7 345 000	R 7 070 000	R 7 860 000	R 8 154 000
11. Total expenditure (9+10)	UNKNOWN	R 5 534 113	R 9 154 290	R 9 629 005	R 9 628 085	R 10 725 055	R 11 362 862
12. Equitable share allocated to water supply	R 0	R 608 697	R 852 860	R 1 023 432	R 1 228 118	R 1 473 742	R 1 768 490
13. Surplus (deficit) (1 minus 11)	(R 130 671)	(R 282 221)	R 289 930	R 997 625	R 1 708 032	R 2 680 897	R 4 000 876

11.20 Total income (and non-payment) and expenditure: sanitation

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Total income (billed income and subsidies)	UNKNOWN	R 2 714 788	R 7 968 760	R 10 384 512	R 10 231 414	R 8 483 697	R 8 070 436
2. Actual income	R 966 533	R 2 714 788	R 3 028 760	R 3 634 512	R 4 361 414	R 5 233 697	R 6 280 436
3. % non-payment	70%	70%	70%	60%	50%	30%	10%
4. Non-payment by residential consumer	70%	70%	70%	60%	50%	30%	10%
5. Non-payment by commercial consumers	70%	70%	70%	60%	50%	30%	10%
6. Non-payment by industrial consumers	70%	70%	70%	60%	50%	30%	10%
7. Non-payment by other consumers	70%	70%	70%	60%	50%	30%	10%
8. Total non-payment (4+5+6+7)	70%	70%	70%	60%	50%	30%	10%
9. Operating expenditure	R 835 862	R 2 432 567	R 3 318 690	R 3 716 932	R 4 162 964	R 4 662 520	R 5 222 022

10. Capital expenditure	UNKNOWN	-	R 4 940 000	R 6 750 000	R 5 870 000	R 3 250 000	R 1 790 000
11. Total expenditure (9+10)		R 2 432 567	R 8 258 690	R 10 466 932.80	R 10 032 964.74	R 7 912 520	R 7 012 022
12. Surplus (deficit) (2 minus 11)	R	R 608 697	R 852 860	R 1 023 432	R 1 228 118	R 1 473 742	R 1 768 490

Through completing the above tables, it can be seen whether the WSA's finances are improving or deteriorating. If they are deteriorating, either the service targets need to be revised to be more affordable, or management activities need to be improved to ensure that proper bills and credit control measures are put in place.

11.21 Sales arrangements

- Type of billing system (separate for water services, combined, creative styles, whether it is computerised or manual);
- Method of sending bills (mail or hand delivery);
- Arrangements for payment collection (offices or door to door);
- Credit control arrangements (related to credit control policy which clearly spells out actions that will be take to collect debts).
- How the WSA aims to improve metering and billing. This could include information on user-friendly bills, programmes to explain to consumers how the billing system works, encouraging users to record their own readings and cross-check those of the meter readers etc.

11.22 Metering and billing: urban

This section relates to the water conservation/demand management section, the institutional and management section as well as the finance section.

Installing meters and implementing an adequate billing system is central to managing services effectively and building a relationship of understanding and trust between the provider and consumer. This type of information is important to be able to project income from tariffs and to adequately understand consumer patterns.

Information is required on the following:

- the extent to which units are metered;
- whether consumers receive monthly bills or are using a prepaid system;
- access to paypoints/coupon outlets.

All user categories can be consolidated into one table for urban areas and one table for rural areas.

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
Communal supply							
1. % communal standpipes metered	100	100	100	100	100	100	100
2. % communal standpipes metered (prepaid)	100	100	100	100	100	100	100
Controlled volume supply							
3. % consumers billed monthly	100	100	100	100	100	100	100
Uncontrolled volume supply							
4. % consumers billed monthly	100	100	100	100	100	100	100
5. % consumers meters read monthly	70	70	75	80	90	100	100
6. % consumers consumption estimated	30	30	25	20	10	0	0
Paypoints							
7. No. billed consumer units/paypoint							
8. No. prepaid consumer units/outlet							
General							
9. Number of new meters installations							
10. % meters tested							
11. % meters replaced							

11.23 Metering and billing: rural dense

Refer to WSDP 3 (Kou Kamma Rural Areas) for this Sub Section.

11.24 Metering and billing: rural villages

Refer to WSDP 3 (Kou Kamma Rural Areas) for this Sub Section.

11.25 Metering and billing: rural scattered

Refer to WSDP 3 (Kou Kamma Rural Areas) for this Sub Section.

11.26 Metering and billing: rural farmland

Refer to WSDP 3 (Kou Kamma Rural Areas) for this Sub Section.

12 LIST OF PROJECTS

Identifying projects can only be done once the other components have been addressed.

When identifying and prioritising projects, emphasis must be placed on appropriate service level options and a progressive increase in service level coverage based on demand responsive criteria. It is important that the WSA has:

- a) clear criteria for project selection;
- b) engaged with communities concerning project prioritisation and selection;
- c) based project selection on informed decision-making.

Project viability is a key criterion. This relates to:

- a technical solution with mixed service levels;
- capital and operating cost;
- tariff to be charged for each service level;
- water services provider institutional arrangements to operate and maintain the services; and
- affordability and willingness of consumers to pay.

Once viable projects have been identified based on the above approach, it is necessary for these projects to be prioritised, based on stated criteria. A reasonable approach would be for projects to be identified for a three-year time horizon, with future infrastructure requirements based on capital allocation, project viability criteria and project prioritisation criteria. A list of projects for the next financial year (i.e. for year 1) must be submitted as part of the WSDP. For the years thereafter, the projects to be implemented must be submitted together with the Water Services Audit.

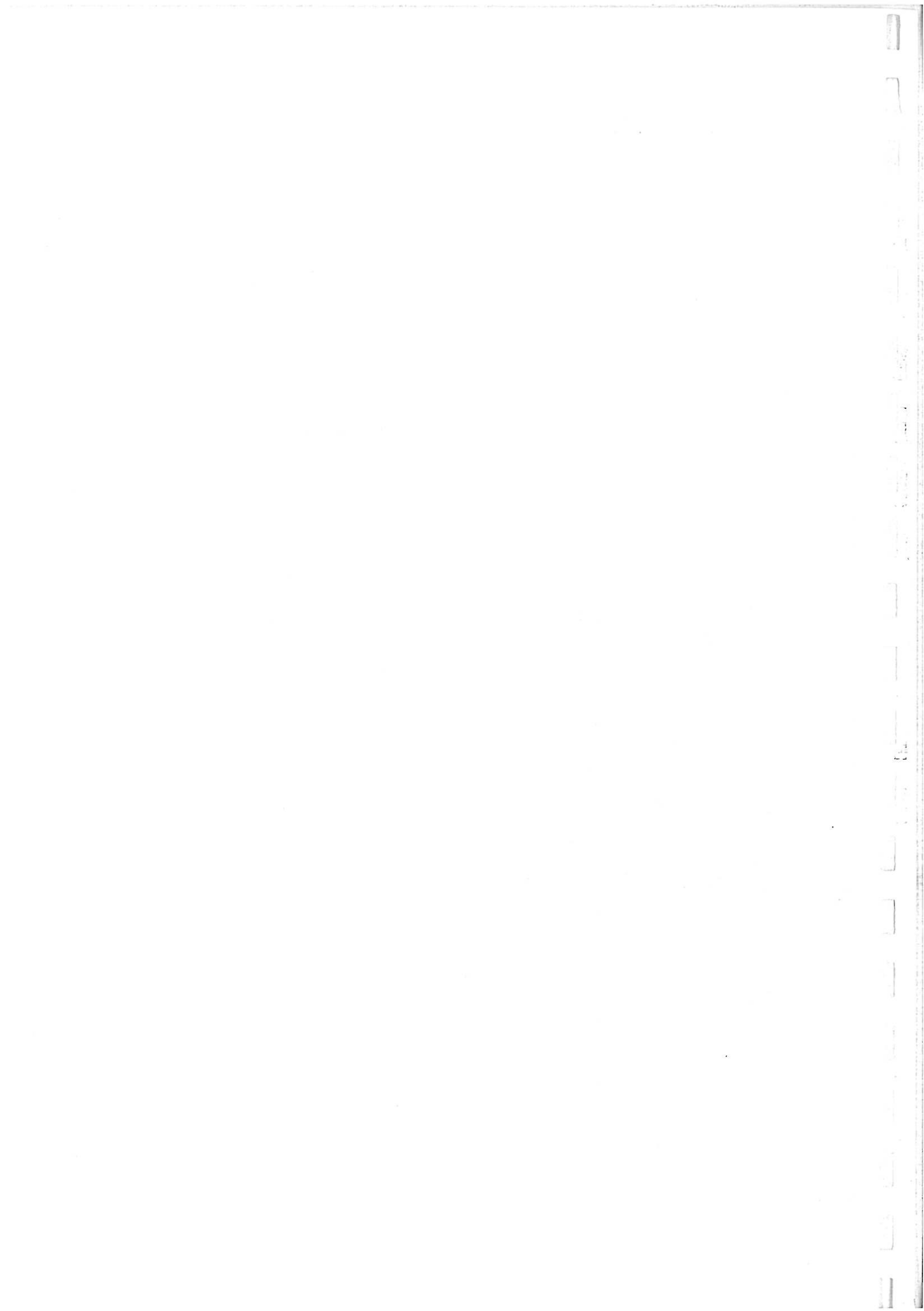
12.3 Annual water and sanitation project list

The annual projected project list for the establishment of adequate water and sanitation infrastructure, as prioritised in the I.D.P. and the Kou Kamma Municipality is summarised in the following Tables 1 & 2 :

Project Programme : water (Kou Kamma)

TABLE 1

Priority Number	Project/Activity	Target Group	Budget/Time Frame					Source of Funding
			2003/4	2004/5	2005/6	2006/7	2007/8	
1	Piping of water furrow + rising 3 Krone dam wall	Kareedouw	1 500					CMIP
2	Undertake a comprehensive water audit	Kou Kamma	220					DBSA
3	New settling tanks for Sandrift Water Treatment Works	Sandrif	650					KKM/CDM
4	Borehole + 200kl storage tank + bulk and reticulation network & water meters for 200 new erven	Eerste Rivier	2 100	1 050				CMIP/DHLG
5	Borehole + 300kl storage tank + bulk and reticulation network & water meters for 400 new erven - Mfengu Farms	Witkeilbos	3 200	1 600				CMIP/DHLG
6	New 350kl Storage Reservoir + Bulk and Reticulation Network & water meters for 400 New erven	Misgund	3 650	1 825	1 825			CMIP/DWAF
7	New borehole + 5kl Storage Tank + Reticulation for 15 erven	Heights / Die Hoogte	650		650			MAAP
8	Lourenwater-bulk water supply - Renegotiate water turn with Irrigation board for increased abstraction	Lourenwater	100	100				CMIP/DWAF
9	New Witteklipriver pumpstation & Ø110mm x 150m uPVC Class 9 rising main	Storms River West	200	200				CMIP/DWAF
10	Bulk and reticulation water meters for 470 erven	Storms River West	430	215	215			CMIP/DHLG
11	Krakeel Rivier - bulk water supply + refurbishment of existing borehole	Krakeel Rivier	550	275	275			CMIP/DWAF
12	New 300kl elevated storage reservoir for 400 new erven	Coldstream	500	250	250			CMIP/DWAF
13	Bulk and reticulation water meters for 200 erven (Die Rye/Punijiesbos)	Coldstream	200		200			CMIP/DHLG
14	Upgrading of bulk water storage - New 1,0Ml reservoir	Kareedouw	1 100		550	550		CMIP/MAAP
15	New borehole + 50kl storage tank + standpipes for 60 erven	Koornansbos	950		475	475		MAAP
16	Pump & rising main from Witteklip Rivier + Water Treatment Works for 50 erven	Goesa	390	130	260			MAAP
17	New 50kl elevated storage tank for 50 erven	Goesa	150					MAAP
18	Bulk and reticulation network & water meters for 50 erven	Goesa	300	300				MAAP
19	Joubertina-water purification works (Phase II & III)	Joubertina	825	400	425			CMIP/DWAF
20	Bulk and reticulation water meters for 675 existing erven	Clarkson	640	320	320			CMIP/DWAF
21	New air valves for existing water reticulation network	Joubertina	220			220		CMIP/DWAF
22	Twoe Riviere-water supply main (New borehole)	Twoe Riviere	2 240			1 120	1 120	MAAP
23	New 500kl Reservoir	Joubertina	650			650		CMIP/DWAF
24	Lourenwater-bulk water supply - Dredging / desludging of storage dam	Lourenwater	400			400		CMIP/DWAF
25	Replacement of old water reticulation in Joubertina	Joubertina	1 500	300	300			CMIP/MAAP
26	Bulk and reticulation water meters for 100 erven + 600m gravity line to CBD	Joubertina	240			240		CMIP/DWAF
27	Bulk and Reticulation water meters for 100 Existing erven	Storms River Village	200			100	100	CMIP/MAAP
28	Joubertina-upgrading of bulk water meters (Phase II)	Lourenwater	340			340		CMIP/DWAF
29	Increase height (capacity) of existing dam wall	Joubertina	400			200	200	CMIP/DWAF
30	16 New bulk water meters	Kareedouw	235			135	100	CMIP/MAAP
31	Construct Water Treatment Works: Phase 2 (New settling tank)	Kareedouw	1 000			1 000		CMIP/MAAP
32	New 250kl storage reservoir + bulk and reticulation network & water meters for 300 New erven	Woodlands	2 200			1 200	1 000	CMIP/DHLG
33	Twoe Riviere-water reticulation	Twoe Riviere	1 611			1 300	311	MAAP
34	Bulk and reticulation water meters for 200 erven	Thornham	205			105	100	MAAP
35	Bulk and reticulation water meters for 60 erven	Griqua Rust	75			75		MAAP
36	Bulk and reticulation network & water meters for 500 new erven - Nompumlelo	Sandrif	2 300			1 300	1 000	CMIP/DHLG
37	Upgrading of WTW + pump and rising main from Kruisrivier for 700 add. new erven	Sandrif	2 300			1 300	1 000	CMIP/DWAF
38	New 1,0Ml reservoir to accommodate add. 700 new erven	Sandrif	1 100				1 100	CMIP/DHLG
39	Bulk and reticulation network & water meters for 200 new Middle Income erven	Sandrif	905				905	CMIP/DWAF
40	New borehole + 50kl storage tank + reticulation + water meters for 33 erven	Blikkiesdorp	1 020				1 020	MAAP
41	Bulk and reticulation water meters for 20 erven	Kwaalbrand	45				45	MAAP
42	Bulk and reticulation water meters for 543 existing erven (40 Erf Houers, 80 Mfengu Farms, 423 Existing)	Woodlands	575				575	CMIP/DWAF
43	Upgrading of Water Treatment Works to accomm. 300 add. new erven	Woodlands	625				625	CMIP/DHLG
44	Develop borehole field	Kareedouw	2 500				2 500	CMIP/MAAP
45	New flow measuring equipment for storage dam	Joubertina	73				73	CMIP/DWAF
Total			41 264	7 115	7 345	7 070	7 860	8 154



ANNEXURE A

PUBLIC PARTICIPATION QUESTIONNAIRE SUMMARY

ANNEXURE A

PUBLIC PARTICIPATION QUESTIONNAIRE SUMMARY

The following table provides a summary of the responses received from the public participation questionnaire. The data is presented in a tabular format, detailing the number of respondents for each category and the corresponding percentage of the total sample. The categories include various demographic and attitudinal factors, such as age groups, gender, and levels of agreement with the proposed project. The summary highlights key trends and insights derived from the survey data, providing a clear overview of public opinion on the matter.

Category	Number of Responses	Percentage
Age Group 18-25	120	15%
Age Group 26-35	180	22%
Age Group 36-45	200	25%
Age Group 46-55	150	18%
Age Group 56-65	100	12%
Age Group 66+	50	6%
Male	300	37%
Female	400	50%
Agree	350	43%
Disagree	250	31%
Neutral	150	18%
Don't Know	50	6%

KOU KAMMA MUNICIPALITY
WATER SERVICES DEVELOPMENT PLAN PREPARATION
PUBLIC PARTICIPATION QUESTIONNAIRE

DISTRICT MUNICIPALITY	:	Cacadu
MUNICIPAL AREA	:	Kou-Kamma
WARD NO	:	No 1
DESCRIPTION OF AREA	:	
DATE COMPLETED	:	

WATER SERVICES STATUS

1. Which of these sources is bringing water services to your community?

Communal standpipes	31 %
Borehole	23 %
Metered yard connections	8 %
Unmetered Yard Connections	15 %
River or stream	23 %

2. Would you like to continue with this source?

YES	14 %
NO	86 %

IF NOT, what type of other source do you now prefer?

Metered yard connections _____

3. Do you use water services for domestic purposes only?

YES	33 %
NO	67 %

If no, what else?

Livestock	46 %
Agriculture	54 %
Other	

4. Do you currently encounter any problems with the provisioning of the service?

YES	71.4 %
NO	28.6 %

If yes, please identify the problem?

Vandalism	31 %
Abrupt interruption	31 %
Leakages	38 %
Purification	
Other	

5. Do you report the problem(s) to the municipality?

YES	100 %
NO	

If yes, how long does it take for them to come and fix?

Same day	20 %
Three to five days	80 %
A month	
Other	

6. Could you indicate the current health status with regard to water services?

Acceptable	14 %
Risky	57 %
Disastrous	
Not acceptable	29 %

7. Does the municipality have a public health programme regarding water services?

YES	100 %
NO	

SANITATION SERVICES STATUS

1. Which of these sanitation services systems is currently used in your community?

Water borne sewerage (flush)	44 %
Bucket System	34 %
On Site Dry VIP or Equivalent	22 %
Wet Installation	

2. Would you like to continue with this system?

YES	29 %
NO	71 %

If no, what type of other system would you prefer?

Please indicate

Water borne sewerage (flush)

3. Do you currently encounter any problems with the provisioning of sanitation services?

YES	85.7 %
NO	14.3 %

If yes, please identify the problem?

Blockages	40 %
Abrupt interruption	20 %
Delays in collection	
Leakages	40 %
Other	

4. Do you report the problem(s) to the municipality?

YES	100 %
NO	

If yes, how long does it take them to attend the problem?

Same day	33 %
Three to five days	67 %
A month	
Other	

5. Could you indicate the current health status with regard to sanitation services?

Acceptable	14 %
Risky	43 %
Disastrous	
Not acceptable	43 %

6. Does the municipality have a public health programme regarding water services?

YES	100 %
NO	

WILLINGNESS TO PAY FOR WATER SERVICES

1. Are you consistently paying the water services rendered to you by the municipality?

YES	12.5 %
NO	87.5 %

If no, why not, and if yes, what does your typical bill amounts to (Rands)?

2. What method of payment for water services is currently employed in your area?

Billing	60 %
Prepaid	
Flat Rate Amount	40 %

3. Are you satisfied with the payment method(s)?

YES	33 %
NO	67 %

4. Would you accept a prepaid system with regard to payment of water services?

YES	100 %
NO	

5. What other method(s) would you propose?

Please specify

WILLINGNESS TO PAY FOR SANITATION SERVICES

1. Are you consistently paying the sanitation services rendered to you by the municipality?

YES	20 %
NO	80 %

If no, why not, and if yes, what does your typical bill amounts to (Rands)?

2. What method of payment for sanitation services is currently employed in your area?

Billing	50 %
Prepaid	
Flat Rate Amount	50 %

3. Are you satisfied with the payment method(s)?

YES	67 %
NO	33 %

4. Would you accept a prepaid system with regard to payment of sanitation services?

YES	
NO	100 %

5. What other method(s) would you propose?

Please specify

Completed by :

Id No. :

Monthly Income

Contact No.:



KOU KAMMA MUNICIPALITY
WATER SERVICES DEVELOPMENT PLAN PREPARATION
PUBLIC PARTICIPATION QUESTIONNAIRE

DISTRICT MUNICIPALITY	:	Cacadu
MUNICIPAL AREA	:	Kou-Kamma
WARD NO	:	No 2
DESCRIPTION OF AREA	:	
DATE COMPLETED	:	

WATER SERVICES STATUS

1. Which of these sources is bringing water services to your community?

Communal standpipes	
Borehole	20 %
Metered yard connections	60 %
Unmetered Yard Connections	20 %
River or stream	

2. Would you like to continue with this source?

YES	40 %
NO	60 %

IF NOT, what type of other source do you now prefer?

Metered yard connections

3. Do you use water services for domestic purposes only?

YES	20 %
NO	80 %

If no, what else?

Livestock	43 %
Agriculture	57 %
Other.	

4. Do you currently encounter any problems with the provisioning of the service?

YES	100 %
NO	

If yes, please identify the problem?

Vandalism	
Abrupt interruption	30 %
Leakages	50 %
Purification	20 %
Other	

5. Do you report the problem(s) to the municipality?

YES	100 %
NO	

If yes, how long does it take for them to come and fix?

Same day	25 %
Three to five days	75 %
A month	
Other	

6. Could you indicate the current health status with regard to water services?

Acceptable	60 %
Risky	40 %
Disastrous	
Not acceptable	

7. Does the municipality have a public health programme regarding water services?

YES	20 %
NO	80 %

SANITATION SERVICES STATUS

1. Which of these sanitation services systems is currently used in your community?

Water borne sewerage (flush)	80 %
Bucket System	
On Site Dry VIP or Equivalent	20 %
Wet Installation	

2. Would you like to continue with this system?

YES	80 %
NO	20 %

If no, what type of other system would you prefer?

Please indicate

Water borne sewerage (flush)

3. Do you currently encounter any problems with the provisioning of sanitation services?

YES	60 %
NO	40 %

If yes, please identify the problem?

Blockages	60 %
Abrupt interruption	
Delays in collection	
Leakages	40 %
Other	

4. Do you report the problem(s) to the municipality?

YES	100 %
NO	

If yes, how long does it take them to attend the problem?

Same day	50 %
Three to five days	50 %
A month	
Other	

5. Could you indicate the current health status with regard to sanitation services?

Acceptable	40 %
Risky	40 %
Disastrous	
Not acceptable	20 %

6. Does the municipality have a public health programme regarding water services?

YES	20 %
NO	80 %

WILLINGNESS TO PAY FOR WATER SERVICES

1. Are you consistently paying the water services rendered to you by the municipality?

YES	20 %
NO	80 %

If no, why not, and if yes, what does your typical bill amounts to (Rands)?

2. What method of payment for water services is currently employed in your area?

Billing	25 %
Prepaid	25 %
Flat Rate Amount	50 %

3. Are you satisfied with the payment method(s)?

YES	75 %
NO	25 %

4. Would you accept a prepaid system with regard to payment of water services?

YES	80 %
NO	20 %

5. What other method(s) would you propose?

Please specify

WILLINGNESS TO PAY FOR SANITATION SERVICES

1. Are you consistently paying the sanitation services rendered to you by the municipality?

YES	75 %
NO	25 %

If no, why not, and if yes, what does your typical bill amounts to (Rands)?

2. What method of payment for sanitation services is currently employed in your area?

Billing	25 %
Prepaid	25 %
Flat Rate Amount	50 %

3. Are you satisfied with the payment method(s)?

YES	75 %
NO	25 %

4. Would you accept a prepaid system with regard to payment of sanitation services?

YES	60 %
NO	40 %

5. What other method(s) would you propose?

Please specify

Completed by :

Id No. :

Monthly Income

Contact No.:



KOU KAMMA MUNICIPALITY
WATER SERVICES DEVELOPMENT PLAN PREPARATION
PUBLIC PARTICIPATION QUESTIONNAIRE

DISTRICT MUNICIPALITY	:	Cacadu
MUNICIPAL AREA	:	Kou-Kamma
WARD NO	:	No 3
DESCRIPTION OF AREA	:	
DATE COMPLETED	:	

WATER SERVICES STATUS

1. Which of these sources is bringing water services to your community?

Communal standpipes	20 %
Borehole	
Metered yard connections	80 %
Unmetered Yard Connections	
River or stream	

2. Would you like to continue with this source?

YES	80 %
NO	20 %

IF NOT, what type of other source do you now prefer?

Metered yard connections

3. Do you use water services for domestic purposes only?

YES	100 %
NO	

If no, what else?

Livestock	
Agriculture	100 %
Other	

4. Do you currently encounter any problems with the provisioning of the service?

YES	10 %
NO	90 %

If yes, please identify the problem?

Vandalism	
Abrupt interruption	
Leakages	44 %
Purification	56 %
Other	

5. Do you report the problem(s) to the municipality?

YES	100 %
NO	

If yes, how long does it take for them to come and fix?

Same day	100 %
Three to five days	
A month	
Other	

6. Could you indicate the current health status with regard to water services?

Acceptable	70 %
Risky	20 %
Disastrous	
Not acceptable	10 %

7. Does the municipality have a public health programme regarding water services?

YES	80 %
NO	20 %

SANITATION SERVICES STATUS

1. Which of these sanitation services systems is currently used in your community?

Water borne sewerage (flush)	80 %
Bucket System	20 %
On Site Dry VIP or Equivalent	
Wet Installation	

2. Would you like to continue with this system?

YES	80 %
NO	20 %

If no, what type of other system would you prefer?

Please indicate

Water borne sewerage (flush)

3. Do you currently encounter any problems with the provisioning of sanitation services?

YES	20 %
NO	80 %

If yes, please identify the problem?

Blockages	
Abrupt interruption	
Delays in collection	100 %
Leakages	
Other	

4. Do you report the problem(s) to the municipality?

YES	100 %
NO	

If yes, how long does it take them to attend the problem?

Same day	100 %
Three to five days	
A month	
Other	

5. Could you indicate the current health status with regard to sanitation services?

Acceptable	80 %
Risky	
Disastrous	10 %
Not acceptable	10 %

6. Does the municipality have a public health programme regarding water services?

YES	80 %
NO	20 %

WILLINGNESS TO PAY FOR WATER SERVICES

1. Are you consistently paying the water services rendered to you by the municipality?

YES	100 %
NO	

If no, why not, and if yes, what does your typical bill amounts to (Rands)?

2. What method of payment for water services is currently employed in your area?

Billing	100 %
Prepaid	
Flat Rate Amount	

3. Are you satisfied with the payment method(s)?

YES	100 %
NO	

4. Would you accept a prepaid system with regard to payment of water services?

YES	
NO	100 %

5. What other method(s) would you propose?

Please specify

WILLINGNESS TO PAY FOR SANITATION SERVICES

1. Are you consistently paying the sanitation services rendered to you by the municipality?

YES	100 %
NO	

If no, why not, and if yes, what does your typical bill amounts to (Rands)?

2. What method of payment for sanitation services is currently employed in your area?

Billing	100 %
Prepaid	
Flat Rate Amount	

3. Are you satisfied with the payment method(s)?

YES	100 %
NO	

4. Would you accept a prepaid system with regard to payment of sanitation services?

YES	
NO	100 %

5. What other method(s) would you propose?

Please specify

Completed by :

Id No. :

Monthly Income

Contact No.:



KOU KAMMA MUNICIPALITY
WATER SERVICES DEVELOPMENT PLAN PREPARATION
PUBLIC PARTICIPATION QUESTIONNAIRE

DISTRICT MUNICIPALITY	:	Cacadu
MUNICIPAL AREA	:	Kou-Kamma
WARD NO	:	No 4
DESCRIPTION OF AREA	:	
DATE COMPLETED	:	

WATER SERVICES STATUS

1. Which of these sources is bringing water services to your community?

Communal standpipes	27 %
Borehole	
Metered yard connections	55 %
Unmetered Yard Connections	18 %
River or stream	

2. Would you like to continue with this source?

YES	50 %
NO	50 %

IF NOT, what type of other source do you now prefer?

Metered yard connections _____

3. Do you use water services for domestic purposes only?

YES	
NO	100 %

If no, what else?

Livestock	23 %
Agriculture	77 %
Other	

4. Do you currently encounter any problems with the provisioning of the service?

YES	100 %
NO	

If yes, please identify the problem?

Vandalism	
Abrupt interruption	27 %
Leakages	17 %
Purification	56 %
Other	

5. Do you report the problem(s) to the municipality?

YES	80 %
NO	20 %

If yes, how long does it take for them to come and fix?

Same day	
Three to five days	100 %
A month	
Other	

6. Could you indicate the current health status with regard to water services?

Acceptable	
Risky	77 %
Disastrous	
Not acceptable	23 %

7. Does the municipality have a public health programme regarding water services?

YES	
NO	100 %

SANITATION SERVICES STATUS

1. Which of these sanitation services systems is currently used in your community?

Water borne sewerage (flush)	60 %
Bucket System	20 %
On Site Dry VIP or Equivalent	
Wet Installation	20 %

2. Would you like to continue with this system?

YES	60 %
NO	40 %

If no, what type of other system would you prefer?

Please indicate

Water borne sewerage (flush)

3. Do you currently encounter any problems with the provisioning of sanitation services?

YES	11 %
NO	89 %

If yes, please identify the problem?

Blockages	67 %
Abrupt interruption	
Delays in collection	
Leakages	33 %
Other	

4. Do you report the problem(s) to the municipality?

YES	67 %
NO	33 %

If yes, how long does it take them to attend the problem?

Same day	
Three to five days	100 %
A month	
Other	

5. Could you indicate the current health status with regard to sanitation services?

Acceptable	46 %
Risky	27 %
Disastrous	
Not acceptable	27 %

6. Does the municipality have a public health programme regarding water services?

YES	11 %
NO	89 %

WILLINGNESS TO PAY FOR WATER SERVICES

1. Are you consistently paying the water services rendered to you by the municipality?

YES	67 %
NO	33 %

If no, why not, and if yes, what does your typical bill amounts to (Rands)?

2. What method of payment for water services is currently employed in your area?

Billing	
Prepaid	
Flat Rate Amount	100 %

3. Are you satisfied with the payment method(s)?

YES	63 %
NO	37 %

4. Would you accept a prepaid system with regard to payment of water services?

YES	100 %
NO	

5. What other method(s) would you propose?

Please specify

WILLINGNESS TO PAY FOR SANITATION SERVICES

1. Are you consistently paying the sanitation services rendered to you by the municipality?

YES	67 %
NO	33 %

If no, why not, and if yes, what does your typical bill amounts to (Rands)?

2. What method of payment for sanitation services is currently employed in your area?

Billing	
Prepaid	
Flat Rate Amount	100 %

3. Are you satisfied with the payment method(s)?

YES	37 %
NO	63 %

4. Would you accept a prepaid system with regard to payment of sanitation services?

YES	100 %
NO	

5. What other method(s) would you propose?

Please specify

Completed by :

Id No. :

Monthly Income

Contact No.:



ANNEXURE B

**ORGANOGRAM : WSDP STAFFING LEVELS FOR
WATER AND SANITATION**

ANNEXURE B

ORGANIGRAM - WSDP STAFFING LEVELS FOR
WATER AND SANITATION

ANNEXURE C

SETTLEMENT DEFINITIONS

ANNEXURE C
SETTLEMENT DEFINITIONS

**SECTION 9 OF THE WATER SERVICES ACT :
REGULATIONS**

ANNEXURE D

SECTION 5 OF THE AMERICAN BONDING AND SECURITY ACT OF 1986

EXHIBIT D

GUIDELINES

FOR

NORMS AND STANDARDS FOR WATER SERVICES TARIFFS

**GAZETTED IN TERMS OF
SECTION 10 THE WATER SERVICES ACT (108 OF 1997)**

July 2001



Introduction

These regulations were developed in terms of section 10 of the Water Services Act (Act no. 108 of 1997), which allows the Minister, with the concurrence of the Minister of Finance, to prescribe norms and standards in respect of tariffs for water services.

The norms and standards are aimed at promoting socially equitable, financially viable and environmentally sustainable tariffs. The departure point in compiling these norms and standards was to provide the responsible water services institution with a framework that reflects best practice while allowing it discretion on how it actually sets and quantifies the tariffs.

It was, however, necessary to be prescriptive on the maximum consumption rate of the first block of the rising block tariff structure for uncontrolled volume domestic connections (six kilolitres per household per month). This was necessary because of the development of a national "free basic water" policy which hinges on the water services institution being able to account separately for the first 6 kl supplied to a household per month. Basic water supply has been defined under section 9 regulations.

Although the water services authority will either be setting tariffs, or deciding the parameters within which tariffs are set, water services providers may in some circumstances set tariffs within the prescribed parameters. It is important to note that these regulations apply to all water services institutions and that no water services institution may use a tariff which is substantially different from any prescribed norms and standards.

Definitions

1. The definitions in these norms and standards are in addition to the definitions provided in Section 1 of the Water Services Act (the Act).

Water Services means water supply and sanitation services.

Water Services Authority means a municipality, responsible for ensuring access to water services.

Water Services Provider means any organisation that provides water services to consumers or to another water services institution.

Water Services Institution means a water services authority, a water services provider, a water board or a water services committee.

Determination of revenue requirements

2. A water services institution must, when determining its revenue requirements on which tariffs for water services are based, take into account at least the need to –
 - (a) recover the cost of water purchases;
 - (b) recover overhead, operational and maintenance costs;
 - (c) recover the cost of capital not financed through any grant, subsidy or donation;
 - (d) provide for the replacement, refurbishment and extension of water services works; and
 - (e) ensure that all households have access to basic water supply and basic sanitation.

The purpose of this regulation is to ensure that the tariffs set by a water services institution are financially sustainable. This is achieved by ensuring that all costs incurred in providing the service are recovered through the tariff.

The cost of water purchases is the amount that the water services institution is charged for bulk raw water or bulk potable water. The Department of

Minimum tariff to cover:

- cost of raw water or bulk potable water, plus
- cost of overhead and operational costs, plus
- cost of capital, plus
- cost of replacement and refurbishment and extension, minus
- subsidies (refer to Regulation 3).

The Water Services Act emphasises that the primary consideration in water services policy is the provision of a “basic water supply” to all households. The purpose of this regulation is to ensure that the tariff for a basic level of service is affordable even to the very poor. This regulation applies amongst others to communal standpipes and to installations such as the Durban tank system which provide a limited quantity of water per day.

According to the Department of Water Affairs and Forestry’s policy on a free basic water supply, a water services institution should make every effort to supply the basic water supply quantity of six kilolitres per household per month free of charge. It would be the norm for users supplied out of standpipes and by means of controlled volume supplies (depending on the size of tank) to use no more than a basic supply and it would also be expected that these users will generally be representative of lower income groups. It should thus be the norm for such users to be supplied free of charge, or at the lowest cost that the water services institution can afford.

Supply of water to a household through a water services work or consumer installation designed to provide an uncontrolled volume of water

6.(1) A tariff set by a water services institution for the supply of water through a water services work or consumer installation designed to provide an uncontrolled volume of water to a household must include a volume based charge that –

- (a) supports the viability and sustainability of water supply services to the poor;*
- (b) discourages wasteful or inefficient water use; and*
- (c) takes into account the incremental cost that would be incurred to increase the capacity of the water supply infrastructure to meet an incremental growth in demand.*

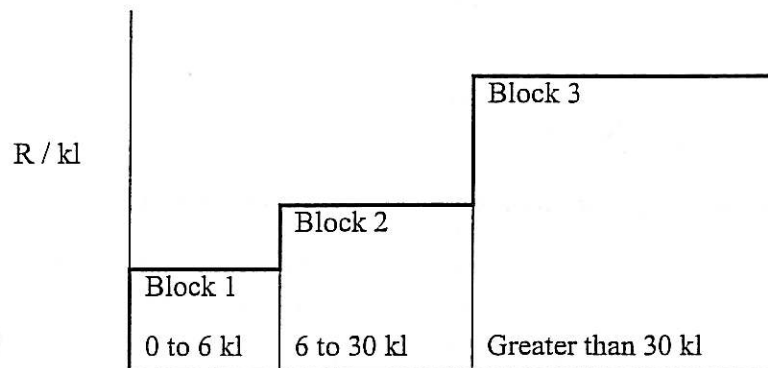
6.(2) The requirements of sub-regulation (1) are deemed to have been met where the tariff is set as a volume based charge that provides for a rising block tariff structure which includes –

- (a) three or more tariff blocks with the tariff increasing for higher consumption blocks;*
- (b) a consumption level for each block defined as a volume consumed by a household during any 30 day period;*
- (c) a first tariff block or lowest tariff block with a maximum consumption volume of six kilolitres and which is set at the lowest amount, including a zero amount, required to ensure the viability and sustainability of water supply services; and*
- (d) a tariff for the last block or highest consumption block set at an amount that would discourage high water use and that reflects the incremental cost that would be incurred to increase the capacity of the water supply infrastructure to meet an incremental growth in demand.*

NB: For more information on the use of this clause for free basic water policy, refer to the “guidelines and implementation strategy for free basic water policy” developed by DWAF: Water Services. The can be obtained from the DWAF website: www-dwa.pwv.gov.za.

This regulation applies to households that are served through a yard connection or a house connection, where the volume they use is unrestricted. The purpose of this regulation is to ensure that, in such cases, the tariff is related to the amount of water used i.e. “the more you use, the more you pay”. A further purpose is to achieve the benefits of charging higher unit rates for higher levels of usage. One way of achieving this is by using a rising block tariff system. Under rising block tariffs, the price per kilolitre increases stepwise with consumption as shown below.

EXAMPLE OF RISING BLOCK TARIFFS



Household Consumption per 30 day period

The rising block system should include at least three tariff blocks but may include more. The tariff for the first block, i.e. consumption between 0 and 6kl per household per month should be set as low as affordable by the water services institution and *should be provided for free if a “free basic water” policy is being implemented*. The second block in a three-block tariff structure is for “normal consumption” meaning that the upper consumption limit of this block should be set such that a household that uses water sparingly should be able to be accommodated within this block. The tariff charged for consumption in this block should ideally reflect the actual or average cost of water.

The third or top block is for “luxury consumption”. A household that uses water for luxury purposes, such as for filling a swimming pool or a household that does not use water sparingly should be required to pay a higher than average price for water that reflects the economic cost of this scarce resource. It could also be argued that the careless use of water is a major cause of having to construct new infrastructure earlier than what would have been required if water was conserved. For this reason it is recommended that the tariff for the highest tariff block should be set at a level that reflects the cost of developing new capacity and should be sufficiently higher than the tariff for the second or middle block to discourage the wasteful use of water.

The mathematics for calculating the charge for different levels of consumption using a rising block tariff structure is demonstrated in the example below:

Why charge a higher unit rate (R/kl) for higher levels of usage?

Equity – those that use water for “luxury purposes” can afford to pay to cross-subsidise basic services to the poor.

Conservation – higher charges gives an incentive for people not to waste water.

Economy –infrastructure has to be constructed to accommodate higher use. Capital expenditure for new infrastructure can be postponed if people conserve water.

TARIFF BLOCK	CONSUMPTION LIMITS	TARIFF PER KILOLITRE
1	0 to 6 kl	free
2	greater than 6 up to 30 kl	R2-50
3	greater than 30 kl	R5-50

A household using 5 kl would in this example pay no charge.

A household using 20 kl in a month would in this example get 6 kl for free and 14 kl at R2-50 per kl. The total charge would thus be R35-00 (R2-50 times 14).

A household using 40 kl in a month would in this example get 6 kl for free; 24 kl at R2-50 per kl; and 10 kl at R5-50 per kl. The total charge would thus be R115-00 (R2-50 times 24 plus R5-50 times 10).

Provision of sanitation services to a household

7. *A tariff set by a water services institution for the provision of sanitation services to a household must*

- (a) support the viability and sustainability of sanitation services to the poor;*
- (b) recognise the significant public benefit of efficient and sustainable sanitation services; and*
- (c) discourage usage practices that may degrade the natural environment.*

The purpose of this regulation is to give guidance on the objectives to be achieved with a domestic sanitation tariff while accommodating different approaches by not being overly prescriptive.

Poor sanitation practices impact negatively on the health and well being of the whole community and also on the environment. A water services institution should support the viability and sustainability of sanitation services to the poor by providing basic sanitation services (for example the removal of sludge from pit latrines) at as low a cost as it can afford to and preferably for free. The provision of low cost or free basic sanitation services would concurrently promote the use of sanitation practices that safeguard the public from diseases and would also discourage the uncontrolled disposal of raw sludge into the natural environment, such as the emptying of slop buckets into streams.

It is expensive and unnecessary to measure water borne sewerage. Rather, the sanitation tariff for water borne sanitation systems should be based on the volume of water supplied. A volume based sanitation charge levied on the higher water supply tariff blocks with no sanitation charge levied on at least the first 6kl would contribute towards the objectives set out in this norm.

Practices that base sanitation charges on factors that are not directly related to usage, such as the number of toilets, the property value or plot size are discouraged.

Fixed charge

8. *Any tariff set by a water services institution for the supply of water services to a consumer may include a fixed charge.*

Regardless of the amount of water that is consumed or effluent that is disposed of, there are fixed costs that are incurred by a water services institution that must be recovered. This includes for example, the costs of employing staff, maintaining equipment and infrastructure, metering, billing and running offices. When determining a tariff structure it is important to recognise that both fixed charges and volume based charges are sources of revenue that together are used to recover costs. The purpose of this regulation is to allow for a fixed charge component in the tariff structure. A fixed charge is a suitable mechanism for recovering costs from owners of holiday homes, where the annual water use may be too low to recover costs by only using a volume based charge.

However, in complying with Regulation 5 and in order to implement the "free basic water" policy, it is important that the fixed charge is not levied for those households using less than six kilolitres per month.

CONNECTION FEE

9. *A water services institution may charge a fee for connecting a consumer to a water services work.*

The costs of connecting new water users to reticulation systems are in many cases significant. This cost can either be recovered through the tariffs over time, or this regulation allows the water services institution to charge a fee for connecting a consumer to the system. The levying of a connection fee does, however, have a further advantage in that it requires that a transaction take place between the water services institution and the consumer, thus ensuring that the new consumer is registered by the water services institution.

A water services institution may decide to charge less than the full cost of a connection up front and to recover the remainder of the cost through the user tariffs over time. A water services institution may also decide to charge the same average cost fee for all new domestic connections that fall within a set distance of the reticulation network with a surcharge based on the length of the connecting pipe only applied for connections of longer than the set distance. Normally a higher charge would be applicable for larger diameter connections.

Fee for upgrading an unauthorized connection

10. *A water services institution may charge any consumer connected to a water services work without the authorization of the relevant water services institution, a connection fee for upgrading the unauthorized connection, irrespective of any other action the water services institution may take against such consumer.*

Unauthorised connections impact negatively on the ability of water services institutions to provide services. When unauthorised connections are made they place additional demands on reticulation systems for which they are often not designed. In addition, the type of connection made is often sub-standard without meters and valves and requires upgrading. In both instances, this imposes costs on the service provider and on other consumers. The purpose of this regulation is to provide for recovering costs incurred in regularising unauthorised connections. The levying of a connection fee for unauthorised connections should not prevent the water services institution from taking other legal action. Bylaws for the municipality must make provisions for this.

Commencement

11. *These regulations take effect on 1 July 2003.*

The period to July 2003 allows all water services institutions time to comply with the regulations.

QUERIES

Queries concerning the implementation of these norms and standards should be directed to:

Mr A Magadagela
Directorate: Operations and Intervention Support,
Department of Water Affairs and Forestry,
Private Bag X313,
Pretoria 0001

at phone 012-336 6501-email vdd@dwaf.gov.za

This guideline is obtainable in electronic format for the Department of Water Affairs and Forestry's web site:
www-dwaf.pwv.gov.za



ANNEXURE F

DRAWINGS

ANNEX 1

THE ANNEXES TO THE CONSTITUTION OF THE UNITED STATES OF AMERICA

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3. Basic Water Supply

The minimum standard for basic water supply services is –

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

A basic minimum standard of water supply is defined as a given *quantity* of potable water delivered within 200m of a household, at a minimum flow rate of 10 litres per minute. These requirements are designed to strike a balance between reducing the time and effort people have to spend collecting water, whilst still recognising that shorter walking distances and high flow rates have cost implications. The *quality* of potable water is covered in Regulation 5.

The government's free basic water policy envisages that every poor household receives 6,000 litres per month free of charge.

The *quantity* of water forming the basic minimum standard is defined as being either 25 litres per person per day or 6,000 litres per household per month (equivalent to 25 litres per person per day for a household of eight people). The reason for the household based volume is that it is often more practical for water services institutions to count the

number of households to be served rather than the actual number of individuals. 25l/p/day is a provision for communal standpipes and 6000 litres for yard connections.

Although eight people were used for 6000 litres, this remains the limit irrespective of the number of people in a household except in cases where the municipality decides to provide a higher amount.

This regulation also includes education in the effective use of water as part of the minimum standard, again acknowledging the fact that the proper operation and maintenance of infrastructure and sound health and hygiene practices would complement the provision of water supply services in improving people's health. Education should also include information on how to use water efficiently and prevent water wastage. This will enable poor consumers not to exceed the free basic water allocation, will promote financial viability for water services institutions by reducing non-revenue demand and promote the objectives of water conservation.

This regulation recognises that reliability of a water supply also forms part of the basic minimum standard. This is addressed by the requirement that no consumer is denied access to basic water supply for more than seven full days in any year

*A full day is a 24-hour period measured from midnight to midnight.
A year is any twelve month period.*

services are being provided. Expressing key information in the form of percentages and comparing these with figures obtained in previous years provides an indication on progress being made in maintaining and extending services.

Cost recovery is a vital factor in ensuring the sustainability of water services. Figures relating to cost recovery are required by the audit to assist the water services institution monitor the financial viability of the water services.

The installation of meters enables a water services institution to monitor and control the provision of services and to improve the efficiency of its billing. Water meters also assist in the determination of water losses and unaccounted for water (UAW) and are an essential component of implementing a free basic water policy. Measurement of water services is also essential in implementing water conservation and demand management measures.

What is unaccounted for water (UAW)?

The water balance basically compares what goes into a water reticulation network with what comes out of it. A water balance can be done for each discrete part of the network as well as for the network as a whole. UAW is the difference between the measured volume of water put into the supply and distribution system and the total volume of water measured to authorized consumers. Losses can be due to a number of reasons:

background leakage: small leaks at joints and fittings;

visible leakage: leaks normally reported by public including burst due to breakages of pipes and fittings or overflowing of reservoirs;

underground leakage: leaks that usually run to ground or stormwater drains or sewer drains caused by breakages of pipes and fittings

authorised but unmetered consumption (I.e. fire fighting).

Unauthorized unmeter usage (i.e. from fire hydrants)

Inaccurate registration of metered consumption (inaccurate meters, broken meters etc)

Non-physical losses: (meter reading errors. book entry errors. billing errors

Water conservation is one of the key issues that the Water Services Act seeks to address. At the water services institution level water loss management and demand management can be used to promote conservation measures. The audit also requires a water services authority to report on what water conservation and demand management measures have been put in place.

There are a number of ways in which the water used by consumers may be regulated by the water services institution. Such measures are collectively referred to as demand management activities. Examples of demand management activities are the encouragement of the use of water saving devices e.g. pressure reducing valves; campaigning for responsible use of water and regulating the use of water in terms of time and quantity.

By undertaking a water balance calculation, the water services institution can work out the amount of water that is being lost to the system, and where these losses are occurring. The audit requires the water services institution to use the water balance to calculate the "unaccounted for water" (UAW). This information provides an indicator of how efficiently the water supply system is being run, and provides information to the water services institution on how to improve the system.

The water audit also requires details of the water quality sampling and testing programme put in place by the water services authority as required under Regulation 5.

11. Water and effluent balance analysis and determination of water losses

(1) Within two years of the promulgation of these Regulations, a water services institution must every month -

(a) measure the quantity of water provided to each supply zone within its supply area;

In all eventualities the key to dealing with interruptions effectively is good *communication* with consumers and prior *planning*.

5. *Quality of Potable Water*

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

The intention of this regulation is to ensure that water services authorities provide potable water that is safe for human consumption, suitable for drinking, food preparation and personal hygiene and not harmful to water supply installations and domestic appliances. This is achieved by requiring water services authorities to implement a sampling and testing programme. Within two years of the promulgation of the regulations, all water services authorities are required to include details of their water sampling programme in the submission of their water services development plan. The sampling programme would have to be developed by the water services authority to best suit local circumstances, taking account of water quality issues experienced locally as well as available resources.

Records of the measurements taken and the calculations that are performed serve as a useful source of information both at the local and national level. These records may be used as a means of assessing progress between successive years. For this reason, this regulation encourages all water services institutions to keep records of all measurements and of the calculations.

12. Repair of Leaks

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

Effective water conservation demands that water losses be quickly controlled and kept to a bare minimum. It is recognised that a large amounts of water are wasted through pipe bursts and leakage without speedy action being taken.

The purpose of this regulation is to ensure that all water services institutions play an active roll in reducing water wastage through pipe bursts and leakage. Ideally the leak should be repaired within 24 hours but in order to accommodate for exceptional cases the time allocated in the regulation has been increased to 48 hours. Water services institutions should ensure proper and efficient procedures for reporting and repair of leaks, which could be combined with the "consumer service" required under Regulation 16. The water services institution should also ensure that it has dedicated resources (equipment, staff, and money) to ensure that leaks that are detected or reported are attended to promptly. In the case of repairs that take more than 24 hours, the water services institution should make arrangements for alternative water supply services as required in Regulation 4.

13. Measurement or control of water supplied

(1) *A water services institution must -*

- (a) *within two years after promulgation of these Regulations, fit a suitable water volume measuring device or volume controlling device to all user connections provided with water supply services that are existing at the time of commencement of these Regulations; and*
- (b) *fit a suitable water volume measuring device or volume controlling device to every user connection made after the commencement of these Regulations.*

(2) *If constructed or installed after promulgation of these Regulations, a suitable water volume measuring device or volume controlling device must be fitted to separately measure or control the water supply to every -*

- (a) *individual dwelling within a new sectional title development, group housing development or apartment building;*
- (b) *individual building, having a maximum designed flow rate exceeding 60 litres per minute within any commercial or institutional complex; and*
- (c) *irrigation system with a maximum designed flow rate exceeding 60 litres per minute that uses water supplied by a water services institution.*

(3) *Where the water supplied is measured by way of a meter, that meter must comply with the Trade Metrology Act, 1973 (Act No. 77 of 1973), if of a size regulated under that Act.*

The quality of water in rivers and streams (watercourses) must be protected. Failure to do so can endanger people's health and result in damage to the natural environment. Runoff from surfaces such as roads, car parks and other surfaces finds its way directly or indirectly (via the storm water drainage system) into watercourses with little or no

Objectionable substances are substances that are unsuitable for discharge into watercourses without treatment. This may include sewage, domestic wastewater, petroleum products (e.g. engine oil), chemicals, leachates from solid waste dumps etc.

treatment. In order to protect the quality of water in rivers and streams, it is important that water services institutions take measures to prevent objectionable substances from entering watercourses. This requires the proper management of storm water runoff with particular attention to the planning / design, operation and maintenance of storm water drainage systems. Water services authorities should also introduce appropriate by-laws that prohibit consumers to discharge any substances other than uncontaminated storm water into the storm water system.

The planning and design of stormwater systems is beyond the scope of these explanatory guidelines. For further information a useful reference would be:

"Guidelines for Human Settlement Planning and Design", by Dept. of Housing / CSIR, Pretoria, 2000.

Whether it is a pit latrine or a piped sewerage network, all sewage systems should be designed to a certain capacity based on the population and sewage loads they have to accommodate. Although there may be some ingress of stormwater into sewage systems, if this is significant, the design capacity of the sewage system may be exceeded. This could result in "backing up" and overflow and spilling of sewage or the inability of treatment plants to cope with flows, resulting in inadequate treatment and discharge into watercourses. Thus, significant stormwater ingress into the sewage system can cause serious health problems as well as damage to the environment. This regulation, therefore, requires all water services institutions to take measures to prevent storm water entering the sewerage system. The exact measures to be taken would depend on the type of sewage system in question and the stormwater runoff

What is the relevance of the National Water Act to this regulation?

According to Schedule 1 (f) of the National Water Act, wastewater or runoff can be discharged into a stormwater system only with the permission of the person controlling the stormwater system (normally the water services authority or other municipality).

Section 21 of the National Water Act

problems experienced in a particular area.

7. Disposal of Grey Water

A water services institution may impose limitations on the use of Grey water if the use thereof may negatively affect health, the environment or available water resources.

peri-urban smallholdings and market garden. The regulations requiring meters to individual buildings in complexes and to irrigation systems, is to promote a culture of water use audits and water use efficiency to consumers.

14. Consumer Installations other than Meters

Every consumer installation must comply with SABS 0252: Water Supply and Drainage for Buildings and SABS 0254: The Installation of Fixed Electric Storage Water Heating Systems, or any similar substituting re-enactment or amendment thereof if the consumer installation is of a type regulated by either standard.

Every consumer installation together with the distribution network forms an integrated water supply system that conveys water from its source to the consumer points where it is drawn. The water services authority is partly responsible for ensuring that water that is delivered into the consumer installations is not lost due to poor materials and installation. It is therefore necessary for water services authorities to lay down appropriate standards to which consumer installations must comply as part of strategies that are aimed at effective water conservation. This regulation sets the standards in accordance with the South African Bureau of Standards (SABS) that must be met by all consumer installations for these to be approved by a water services authority.

Relevant SABS Specifications

*SABS 0252: Water Supply and Drainage for Buildings
SABS 0254: The Installation of Fixed Electric Storage Water Heating Systems*

Compliance with minimum specifications ultimately provides protection to the consumer by ensuring that plumbing installation and equipment adheres to certain performance and safety requirements. In turn, this also leads to a minimizing of maintenance and a reduction in risk

of malfunction and leaks. This regulation has been included also due to the particular safety hazards related to electrically heated water storage systems. These aspects would be addressed through the compliance with SABS standards. Water services authorities are required to incorporate these requirements into their own by-laws and appoint inspectors who will be amble to verify compliance to plumbing installations.

15. Pressure in a Reticulation System

- (1) *A water services institution must design and maintain every water reticulation system installed after promulgation of these Regulations to operate below a maximum pressure of 900 kPa.*
- (2) *Where water pressure in a water reticulation system could rise above 900kPa, a water services institution must install a pressure control device to prevent the pressure at any domestic consumer connection from rising above 900 kPa.*

Effective management requires practical methods with which to reduce water losses. Water losses in a reticulation system are caused by various factors including pipe bursts and leaking connections. Although pressure is required to make water flow through the system, excessive pressures considerably increase leakage as well as wear and tear on pipes and fittings. It is therefore necessary to strike a balance between levels of pressure that ensure adequate flow through pipelines and maintaining the pressure at a level that does not result in excessive water losses and system deterioration. It is also generally true that water gushing out of a tap or standpipe in large volumes at high speed is difficult to control. Such a situation causes consumers to receive more water than they actually need resulting in wastage.

Water reticulation systems that are planned after the regulations are promulgated should be designed to operate below a pressure of 900 kPa (kilo Pascal) and if feasible below 600 kPa. The water services institution should amend the design standards for water reticulation systems, in its area of jurisdiction, in order to specify the permissible maximum pressure at any point in a reticulation system. Approval of the

9. Quantity and Quality of Industrial Effluent Discharged into a Sewerage System

Natural water sources can only handle a limited pollution load. Every institution that discharges effluent into a water body (river, stream, lake, and reservoir) must have an authorisation to do so from the

A water services institution is only obliged to accept the quantity and quality of industrial effluent or any other substance into a sewerage system that the sewage treatment plant linked to that system is capable of purifying or treating to ensure that any discharge to a water resource complies with any standard prescribed under the National Water Act.

Department of Water Affairs and Forestry. The authorisation would specify the types and maximum levels of contaminants that the effluent is allowed to contain.

Before a water services institution allows an industry or business to connect to its sewerage system it must consider the effect of that discharge on the quantity and especially the quality of the effluent ultimately discharged from the sewage works. If accepting that discharge would pose a risk to the treatment process or lead to a breach of the permit, the water services institution should only agree to accept the effluent once the harmful substances have been removed or reduced. Industries can comply by:

- pre-treating their effluent such that it complies with the permit conditions;
- separating effluent discharges and treating the harmful component of the discharges separately; or
- collecting harmful streams that are then removed by appropriate waste disposal contractors.

The quantity and the concentration of the effluent must be considered together to get the total contaminant load. Industries should not be allowed to dilute effluent in order to comply with set concentration limits.

Water Services institutions should monitor the effluent discharge by large industrial consumers on a regular basis in order to ensure compliance is maintained on an ongoing basis.

10. Water Services Audit

(1) *A water services authority must include a water services audit in its annual report on the implementation of its water services development plan required in terms of section 18(1) of the Act.*

(2) *A water services audit must contain details for the previous financial year and, if available, comparative figures for the preceding two financial years of –*

(a) *the quantity of water services provided, including at least -*

- (i) *the quantity of water used by each user sector;*
- (ii) *the quantity of water provided to the water services institution by another water services institution;*
- (iii) *the quantity of effluent received at sewage treatment plants; and*
- (iv) *the quantity of effluent not discharged to sewage treatment plants and approved for use by the water services institution;*

(b) *the levels of services rendered, including at least -*

- (i) *the number of user connections in each user sector;*
- (ii) *the number of households provided with water through communal water services works;*
- (iii) *the number of consumers connected to a water reticulation system where pressures rise above 900 kPa at the consumer connection;*



This regulation requires a water services authority to complete and submit a water services audit every year. The audit is designed to monitor the compliance of the water services authority and other water services institutions with these regulations. As much of the information required for the Minister to monitor water services institutions is similar to the information required for reporting on the water services development plan, these regulations call for a water services authority to submit this audit as part of their annual report on the implementation of their plan. **This allows the audit to be used as a tool to compare actual performance of the water services authority against the targets and indicators set in their plan. The water audit can also be used to determine opportunities, the role and key performance indicators of water conservation and water demand management.**

By understanding who and how water is used this will

What is the purpose of the water services audit?

- *To monitor compliance with these regulations;*
- *To compare actual performance against targets contained in the water services development plans.*
- *To determine the opportunities of water conservation and water demand management*

these figures in terms of user sectors. The water services authority is required to sub-divide their consumers into specific user sectors. Each sector should consist of consumers with similar consumption patterns e.g. residential, commercial, industrial etc. Through the separation and measurement of supply to these sectors, the water services authority is able to record the total **quantity** of water services used by each user sector. This information would enable water services authorities to monitor whether resources are being allocated on an equitable basis and would assist in determining the tariff structure.

Where do we get the information?

- *departments within the municipality (the water services authority) e.g. technical services, finance, administration etc.;*
- *other municipalities within the area of jurisdiction of the water services authority e.g. a local municipality;*

What kind of information is required in an audit?

- *quantity of water services supplied;*
- *level of service provided;*
- *level of cost recovery achieved;*
- *progress with meter installations;*
- *water quality sampling and testing;*
- *progress on water conservation and demand management measures.*

This information is essential for the water services authority and provider to manage the system properly.

assist water services institutions as well as DWAF in the planning of water services and water resources respectively.

In order to assist municipalities, the way the information for the annual water services audit is supplied is fully integrated with the process of reporting on the water services development plans.

In order to manage water services efficiently, it is important to be able to measure and quantify the services provided to consumers and to separate

If the water services authority receives bulk water from other water services institutions (e.g. a water board), it should record the total quantity of water received from each of these. The recording of effluent received at the sewage treatment plants provides important information on water utilisation i.e. what proportion of the water fed into the system is discharged.

The levels of services rendered provide an indication of the equitable basis on which



- (b) determine the quantity of unaccounted for water by comparing the measured quantity of water provided to each supply zone with the total measured quantity of water provided to all user connections within that supply zone;
 - (c) measure the quantity of effluent received at each sewage treatment plant; and
 - (d) determine the quantity of water supplied but not discharged to sewage treatment plants by comparing the measured quantity of effluent received at all sewage treatment plants with the total measured quantity of water provided to all user connections.
- (2) A water services institution must -
- (a) take steps to reduce the quantity of water unaccounted for; and
 - (b) keep record of the quantities of water measured and of the calculations made.

Knowledge of the extent of water losses is essential for effective management of water services. Water services institutions are therefore required to determine the amounts of water losses and unaccounted for water and to seek economical ways of reducing these losses (*refer to Regulation 10*).

The water services institution should sub-divide its entire area of supply into discrete supply areas using criteria such as topography, layout of the distribution system, pressure zones or townships fed from one or more metered bulk supply mains. Each supply area should further be sub-divided into supply zones whereby each supply zone comprises of a given number of houses that are all supplied with water from one or more water supply mains. The water services institution should implement a program to install meters at appropriate positions on the distribution network i.e. bulk meters on supply mains to the supply area, zone meters to parts of the water distribution system that can be isolated from the rest and meters on every consumer connection. The water services institution should take regular monthly readings of all meters and replace faulty or unreadable meters.

The quantity of water provided to a supply zone represents the amount of measurable water that has been delivered into one of these well-defined areas, townships or suburbs. When this measurement is compared with the total measured quantity of water used by consumers in that supply zone, the difference provides an indication of unaccounted for water usage within the water supply network in that area. In order to highlight the impact of UAW, it is recommended that it is also reflected in terms of financial losses. Water services institutions are encouraged to determine an appropriate benchmark of UAW according to their own specific circumstances.

The quantity of effluent received at each sewage treatment plant is an essential component of the total water balance. The difference between the total quantity of water provided to consumers and the total quantity of effluent received at sewage treatment plants over the same period should give an indication of the water that has either been retained by consumers (e.g. in swimming pools or used for the watering of gardens), or lost through leakage in the water and sewerage networks. Such information is essential in the formulation of water conservation strategies and in water resource planning. The water services institution should ensure that all sewage treatment plants under its control are equipped with appropriate meters to measure the flow quantities. The ingress of stormwater in the sewerage system has the effect of inflating the quantity of effluent received at sewage treatment works resulting in misleading figures. To assess the magnitude of the ingress of stormwater in the sewerage that the sewerage flow patterns are compared to average rainfall figures. Not all water provided to consumers ends up at the sewage treatment plants. Some consumers, especially in the industrial and agricultural sectors, make use of the effluent emanating from their manufacturing processes. The use of recycled effluent is however subject to approval by the water services institution (refer to Regulations 7 and 8).

<p>References</p> <p><i>SABS 0306: 1999 the code of practice for "The management of potable water in distribution systems" provides an approach which water services institutions may use to</i></p>



What is a volume-controlling device?

A "volume controlling device" is a mechanism that restricts the supply of water to a consumer to a pre-arranged quantity. This could be used to:

- ensure that, where consumers are unable to pay for more than a certain amount of water, they are unable to exceed this amount (e.g. in implementing the free basic water policy, volume can be restricted to 200 litres per day for those who cannot afford to pay for water); or to
- ensure the equitable allocation of water where there are limited water resources (i.e. everyone gets their share and no more).

Before installing any form of volume control it is vital that consumers are consulted to ensure that they understand why their water supply is being restricted and to ensure that they agree to this approach.

Examples of volume controlling devices include manually or automatically regulated yard/roof tanks and trickle feed systems. For more information refer to "Water supply service levels: a guide to local authorities" available from DWAF, Directorate: Interventions and Operations Support.

The Water Services Act calls for the operational efficiency and economic viability of water services. In order to meet these objectives, it is important that water services institutions can measure the amount of water being supplied to consumers. Measurement can be done by using meters or by controlling the volume of water supplied to consumers. Good measurement and control of water supplies enables the water services institution to develop a more efficient and fair billing system and makes it easier to determine and minimise unaccounted for water (UAW). Measurement and volume control are also essential components of implementing Government's "free basic water" policy. It is also a necessary tool for efficient management of a water supply system.

This regulation provides for a period of two years within which all **user connections** existing at the time of promulgation of the Regulations are to be fitted with meters or volume controlling devices. *The word "user connection" has been defined in the regulations and does not only refer to individual connections.* The two year period, within which these measure have to be implemented allows the water services institution time to:

- carry out necessary surveys to identify the nature and magnitude of the work required;
- allocate financial resources; and to
- plan and implement any necessary work.

In the case of developments that are *built after the regulations have been promulgated*, the water services authority should ensure *the metering (or volume control) of all new user connections including individual dwellings in group housing developments, sectional title developments and apartment buildings.*

The metering (or volume control) of all individual dwellings can be made conditional to the approval of building plans.

With regard to commercial or industrial developments that are constructed after the regulations have come into force, all individual buildings within such complexes, whose anticipated water usage is in excess of 60 litres per minute, should be separately metered or controlled. Meters for individual meters within complexes will not belong to the water services authority and do not have to be read by them. The

Benefits of meters or volume control devices

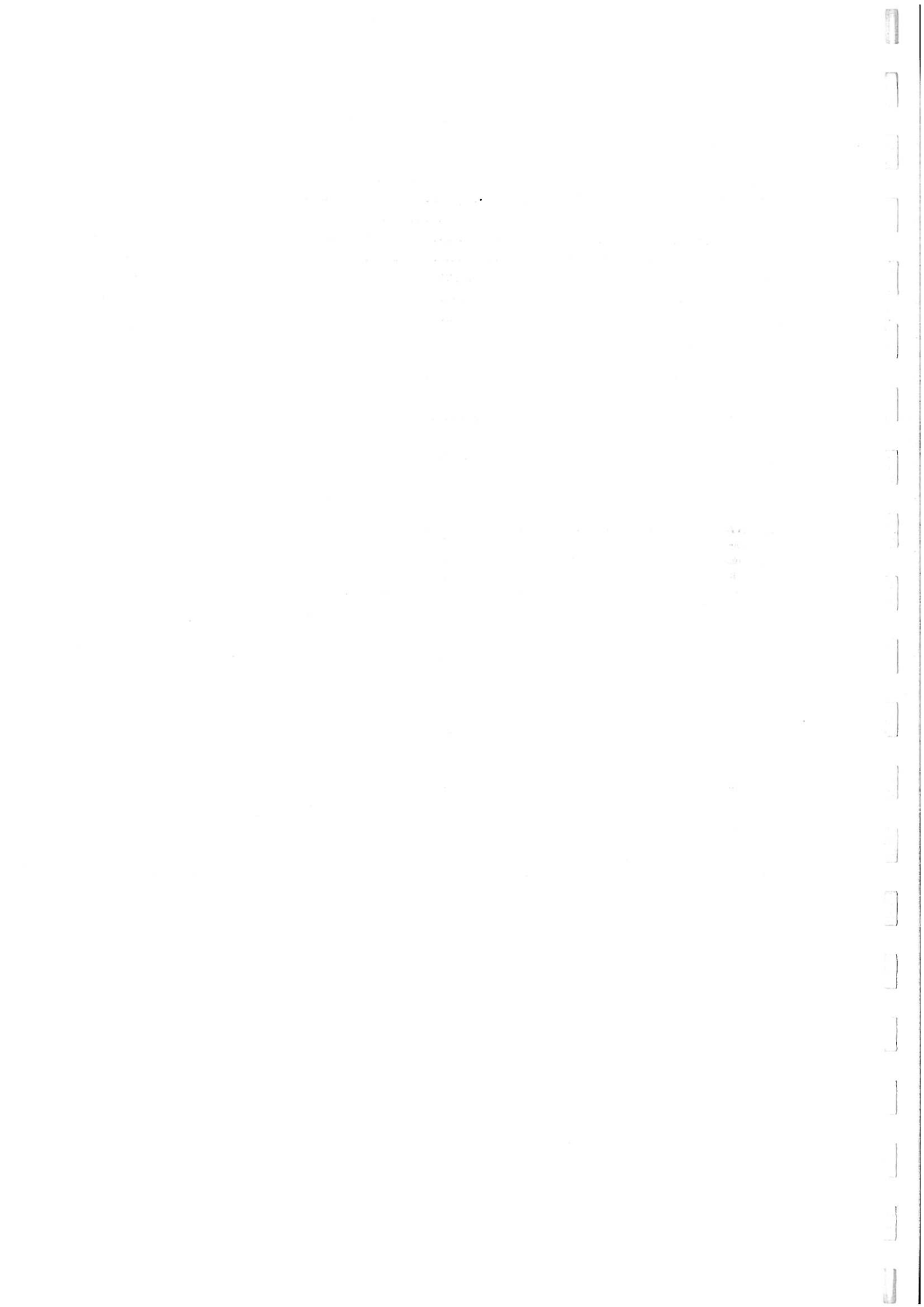
For consumers

- It assists in minimising wastage.
- It enables consumers to manage their water usage and hence expenditure on this commodity.
- It enables the detection and repair of leaks on consumer installations thereby avoiding high water bills.
- It is fair and equitable, water efficient consumers do not have to pay for excessive use of wasteful consumers

For water services institutions

- It allows planning and monitoring of water conservation efforts and demand management strategies
- It facilitates the effective monitoring and control of consumption by user sector.
- It enables the determination of water losses and hence provides for a more effective management.
- It is a pre-requisite for an efficient billing system;
- It is essential for the implementation of a "free basic water" policy.

water services authority should amend its building standards or by-laws to make provision for the metering (or volume control) of such buildings to be conditional to the approval of the building plans. The use of building standards or by-laws should however be supplemented by physical inspections and on site tests in order to ensure compliance. In addition, separate water meters or volume control devices are required to all connections provided for irrigation purposes where supply exceeds 60 litres per minute. Examples of these connections include golf courses, sports fields,



designs for any new reticulation system should be conditional on the maximum operating pressures being lower than 900 kPa.

In the case of water reticulation systems existing at the time the regulations were enforced, the water services institution should analyse the reticulation system in order to identify areas where the operating pressures exceed 900 kPa. The method of analysis of the pressure distribution in a water reticulation system is dependent upon the nature of the pressure system. Some reticulation systems are gravity fed whereas pumping devices of varying types drive others. In the case of water towers and break pressure reservoirs (usually from gravity fed bulk supplies or pumping bulk supplies) the maximum overflow level will occur when the demand is very low. This is called the static water pressure elevation. Where water is pumped directly into the distribution system, the maximum operating pressure will be dependent on the pump.

Once a proper analysis has been undertaken and areas where pressure exceeds 900kPa have been identified, pressure control devices such as pressure reducing valves or break pressure tanks should be installed to make the system comply with this regulation. Water services institutions are also advised to consider the installation of "smart pressure reducing valves". Such valves reduce pressure during the night where demand is low and by doing so reduce the level of leakage and protect the supply system from excessive pressures.

The difference between the elevation of the storage reservoir feeding the reticulation network and the elevation at the consumer connection constitutes the maximum pressure at the consumer connection, i.e. the difference between these two elevations in metres, multiplied by a factor of approximately 10, constitutes the approximate pressure in kPa.

16. Reporting of non-compliance

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

One of the main objectives of these regulations is to ensure that consumers are aware of their rights and understands the roles and obligations of water services institutions with respect to compulsory national standards. It is also important that consumers know what to do in the event that a water services institution fails to meet its obligations. This regulation requires a water services institution to set up a consumer service. The purpose of the consumer service is primarily to receive and record all instances of non-compliance reported by consumers along with what responses and actions have been taken to address the complaint. The contact details of the consumer centre should be widely publicised and information should be provided on how a complaint can be made, and on how a consumer can follow up to ensure that it is being addressed. The efficiency, accessibility, responsiveness and accountability of the consumer centre will largely dictate the public image of the water services institution.



ANNEXURE E

**SECTION 10 OF THE WATER SERVICES ACT :
NORMS AND STANDARDS FOR WATER SERVICES
TARIFFS**

ANNEXURE B

SECTION 13 OF THE WATER SERVICES ACT
NORMS AND STANDARDS FOR WATER SERVICES
TABLE 1

What are recognised quality standards?

Details of the procedure for the establishment of a water quality-sampling programme are too complex to be adequately dealt with in these explanatory notes. For more information the reader is referred to SABS 241 and the following publications, obtainable, upon request, from the Department of Water Affairs and Forestry, Department of Health or the Water Research Commission :

Quality of Domestic Water Supplies

Volume 1 : Assessment Guide

Volume 2 : Sampling Guide

Volume 3 : Analysis Guide

Volume 4 : Treatment Guide

Volume 5 : Management Guide

For water to be of an acceptable quality, it should comply with minimum quality standards that are recognised. In order to ensure a reliably safe quality of water, it is necessary to carry out water quality monitoring on a regular basis. This does not mean that a complex testing programme is required, but certain basic water quality tests are required to ensure that water is safe for human consumption. Where initial tests indicate that there may be cause for concern, additional testing is required to investigate the possible contamination.

The reason for requiring a sampling and testing programme is to protect the health of consumers. The results of the tests should be

compared to the standards referred to in this regulation. If there is any actual or potential risk to the health of consumers, the water services authority is required to inform the Director General of the Department of Water Affairs and Forestry, the Health Department of the Provincial Government and its consumers. Consideration should also be given to suspending the water supply until the water quality problem can be rectified.

Communications to consumers should be clear, well targeted and should keep people continuously informed of developments. Information provided should include the risks and dangers associated with the water, the cause(s) of the problem, precautions that consumers should take in order to protect their health and the time frame in which the water services authority intends to have the situation rectified.

Certain water quality issues may not be harmful to health, but could cause inconvenience to consumers or could damage household appliances. In such cases, the water services authority should inform consumers of the potential problems and advise on any mitigating measures they can take.

6. Control of Objectionable Substances

(1) A water services institution must take measures to prevent any substance other than uncontaminated storm water to enter -

(a) any storm water drain; or

(b) any watercourse, except in accordance with the provisions of the National Water Act.

(2) A water services institution must take measures to prevent storm water from entering its sewerage system.

1. Definitions

In these Regulations any word or expression to which a meaning has been assigned in the Act shall bear that meaning and, unless the context otherwise indicates –

“effluent” means human excreta, domestic sludge, domestic wastewater, grey water or wastewater resulting from the commercial or industrial use of water;

“grey water” means waste water resulting from the use of water for domestic purposes, but does not include human excreta;

“supply zone” means an area, determined by a water services institution, within which all the consumer connections are provided with water supply services from the same bulk supply;

“the Act” means the Water Services Act, 1997 (Act No. 108 of 1997);

“the National Water Act” means the National Water Act, 1998 (Act No. 36 of 1998);

“user connection” means any connection through which a user can gain access to water services and includes any consumer installation and any bulk or communal connection.

“user sector” means the applicable category of users, being users categorised into at least either –

- (a) domestic;*
- (b) industrial; or*
- (c) commercial, sectors;*

“water efficient device” means any product that reduces the excessive use of water.

The definitions in the compulsory national standards are in addition to the definitions provided in Section 1 of the Water Services Act (the Act). The term “user connection” is used in these regulations rather than the term “consumer installation” defined in the Act. This is because “user connection” includes both “consumer installations” (connections to end users) as well as bulk connections to other water services institutions.

1. Introduction

In terms of Section 9(1) of the Water Services Act (Act 108 of 1997), the Minister of Water Affairs and Forestry may prescribe compulsory national standards. These Regulations regulate the supply of potable water and sanitation services to consumers.

It is important to note that these regulations apply to all water services institutions.

The objectives of the regulations are to *protect consumers*, municipalities and water services institutions and to ensure the application of sound management principles.

Key principles incorporated in the regulations are:

- the regulations aim to be simple and easy to implement;
- the regulations should encourage good management principles and general good practice;
- the regulations should respect the independence of local government as the sphere of government responsible for water services i.e. the regulations should focus on broader issues of good practice and leave municipalities the discretion on *how* to implement the regulations.

The regulations have been developed after much consultation at local, provincial and national levels with all key stakeholders. The Department of Water Affairs and Forestry (DWAF) places great emphasis on supporting municipalities to implement the regulations. These guidelines have been produced as a tool to assist consumers, municipalities and other water services providers in understanding the regulations. The guidelines explain the purpose of each regulation and may provide options on implementation.

Water Services Authority means a municipality responsible for ensuring access to water services.

Water Services Provider means an organisation that provides water services to consumers or to another water services institution.

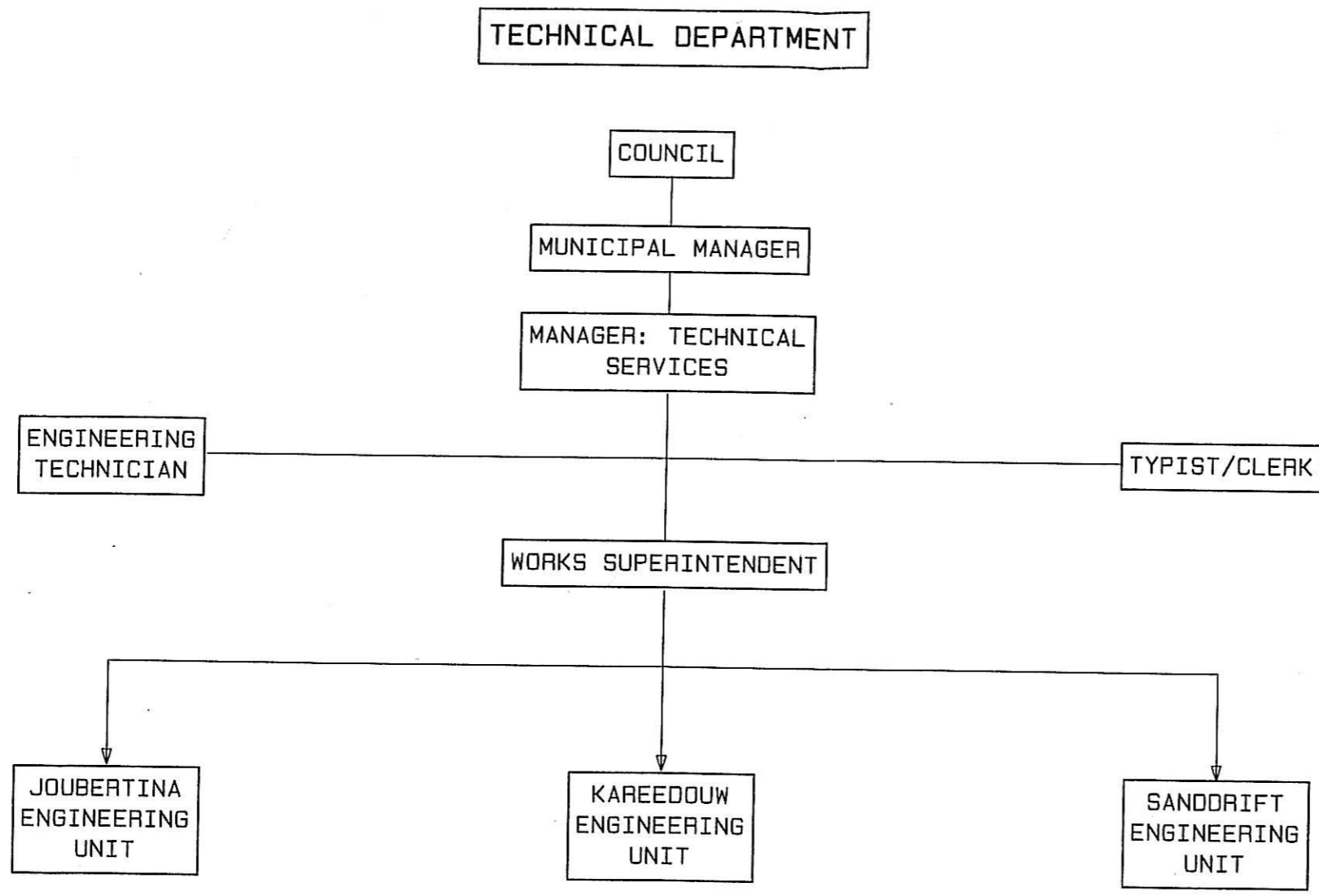
Water Services Institution means a water services authority, a water services provider, a water board or a water services committee.

Water Services means potable water supply services and sanitation (sewage and wastewater) services.

**GUIDELINES
FOR
COMPULSORY NATIONAL STANDARDS**

**GAZETTED IN TERMS OF
SECTION 9 THE WATER SERVICES ACT (108 OF 1997)**

July 2001



Notes

Amendment

No.	Date	Checked	Done by	Description

KWEZI V3 ENGINEERS
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 e-mail: portelizabeth@v3.co.za



Designed	Drawn	Checked

Consulting Engineer _____ Date _____

Client _____ Date _____

Client
KOUKAMMA MUNICIPALITY

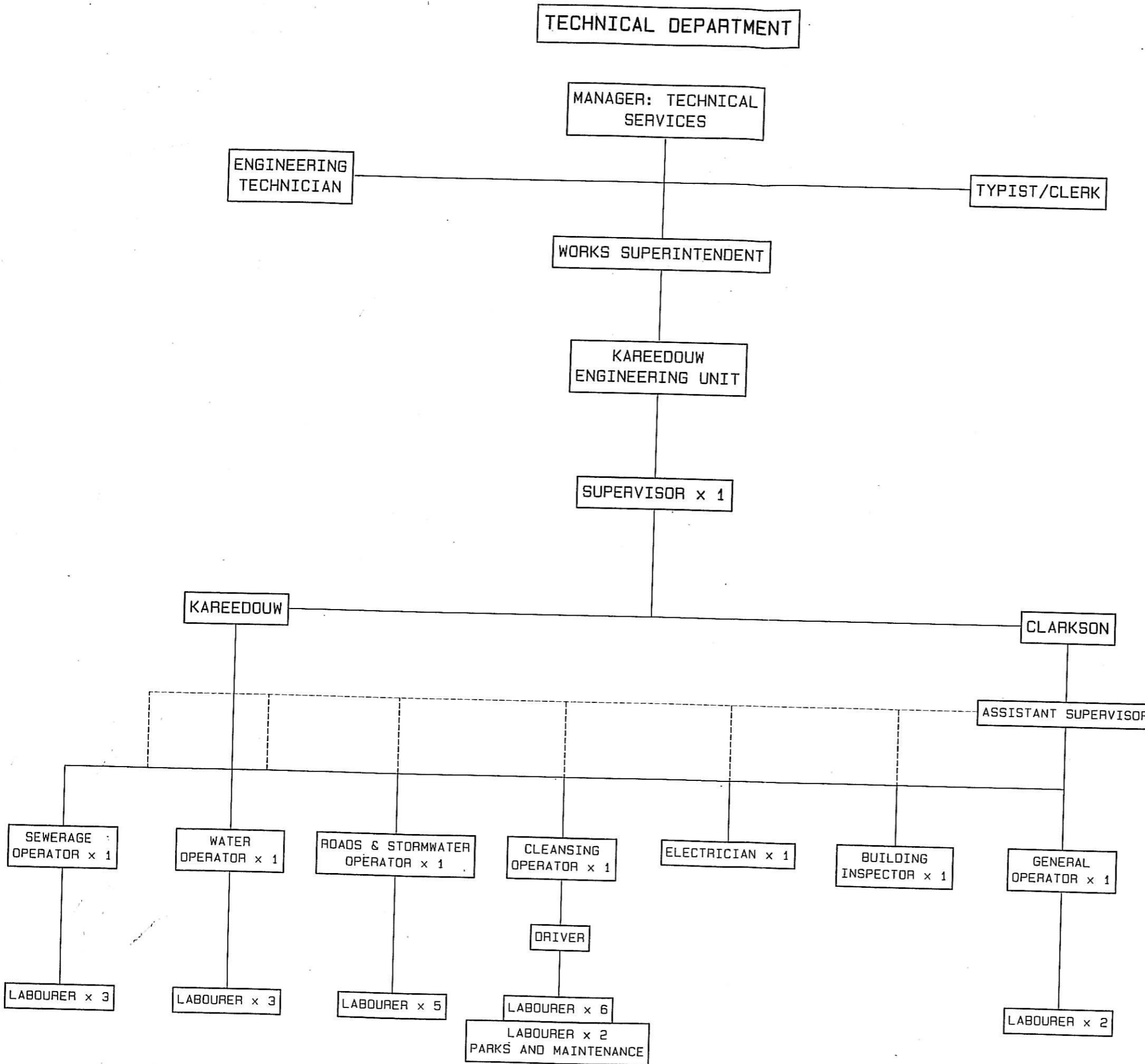
Project
KOUKAMMA WATER SERVICES DEVELOPMENT PLAN

Drawing description
ORGANOGRAM: KOUKAMMA TECHNICAL SERVICES OPERATING UNIT

Scale: N. T. S. Date: JUNE 2003

Drawing number
18961000/A





Notes

Amendment

No.	Date	Checked	Done by	Description

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Consulting Engineer _____ Date _____

Client _____ Date _____

Client
KOUKAMMA MUNICIPALITY

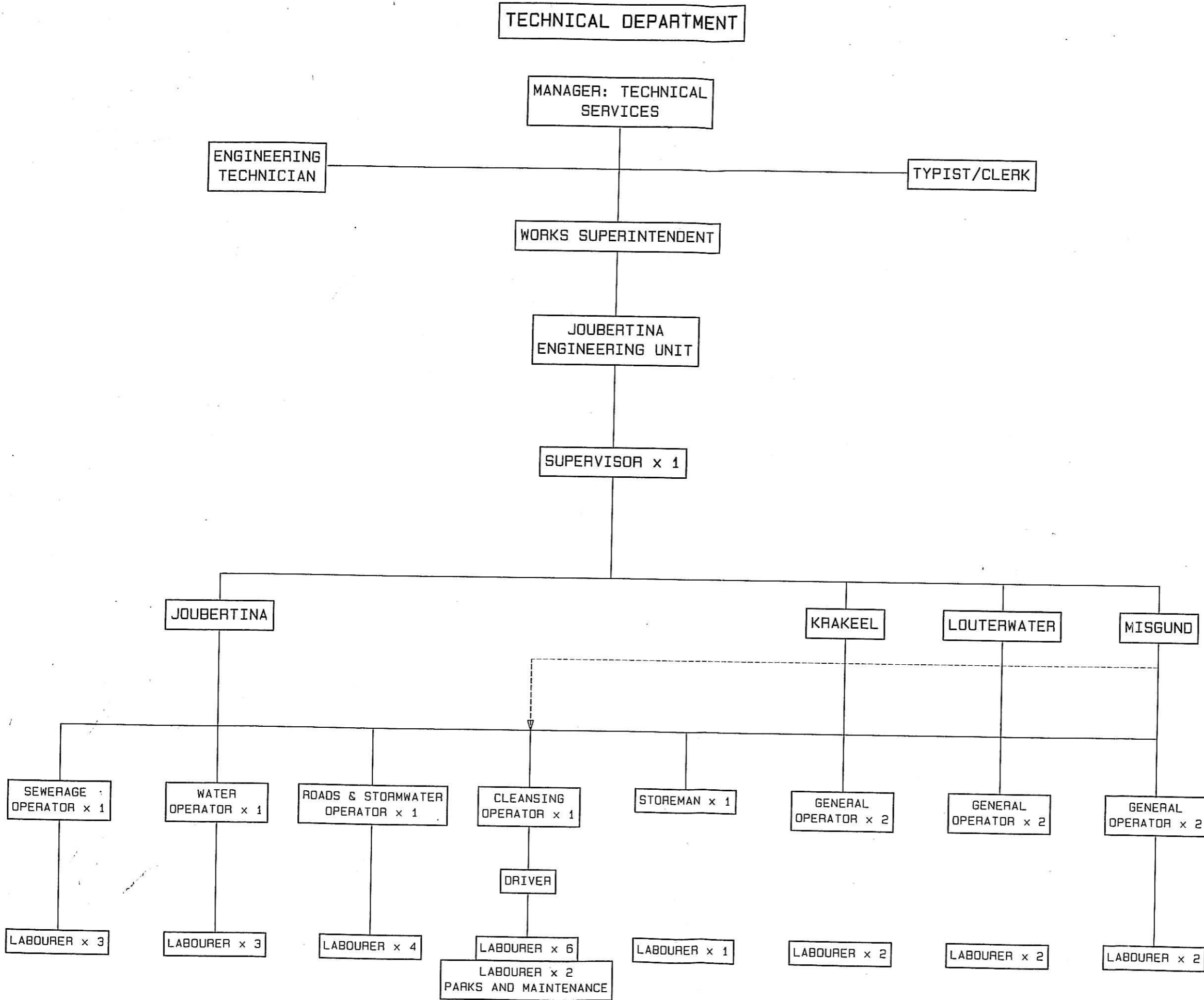
Project
KOUKAMMA WATER SERVICES DEVELOPMENT PLAN

Drawing description
ORGANOGRAM: KAREEDOUW TECHNICAL SERVICES OPERATING UNIT

Scale N. T. S. Date JUNE 2003

Drawing number
18961000/B





Notes

Amendment

No.	Date	Checked	Done by	Description

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Consulting Engineer _____ Date _____

Client _____ Date _____

Client

KOUKAMMA MUNICIPALITY

Project

KOUKAMMA WATER SERVICES DEVELOPMENT PLAN

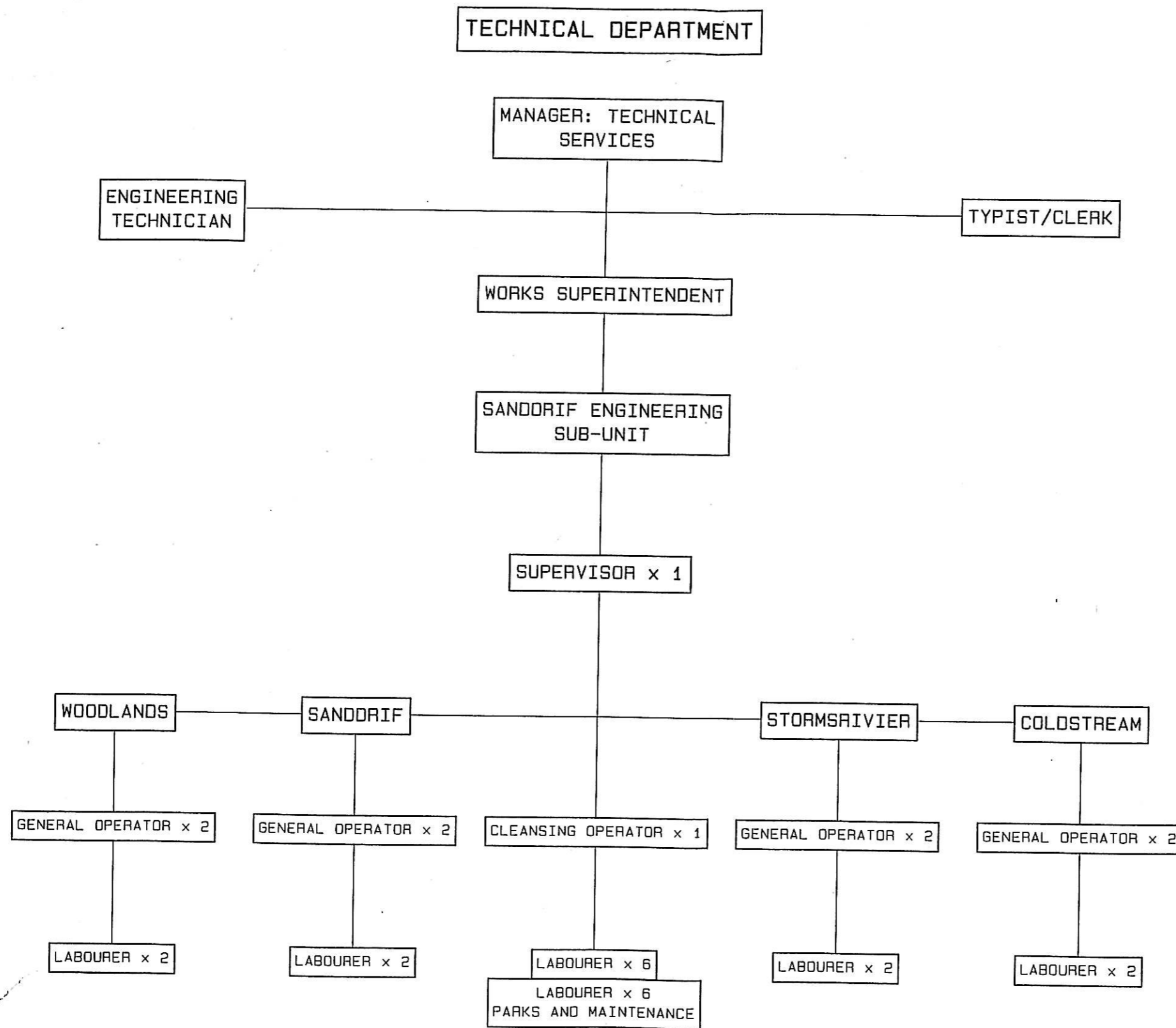
Drawing description

ORGANOGRAM: JOUBERTINA TECHNICAL SERVICES OPERATING UNIT

Scale N. T. S. Date JUNE 2003

Drawing number
18961000/C





Notes

Amendment

No.	Date	Checked	Done by	Description

KWEZI V3 ENGINEERS

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Consulting Engineer _____ Date _____

Client _____ Date _____

Client

KOUKAMMA MUNICIPALITY

Project

KOUKAMMA WATER SERVICES DEVELOPMENT PLAN

Drawing description

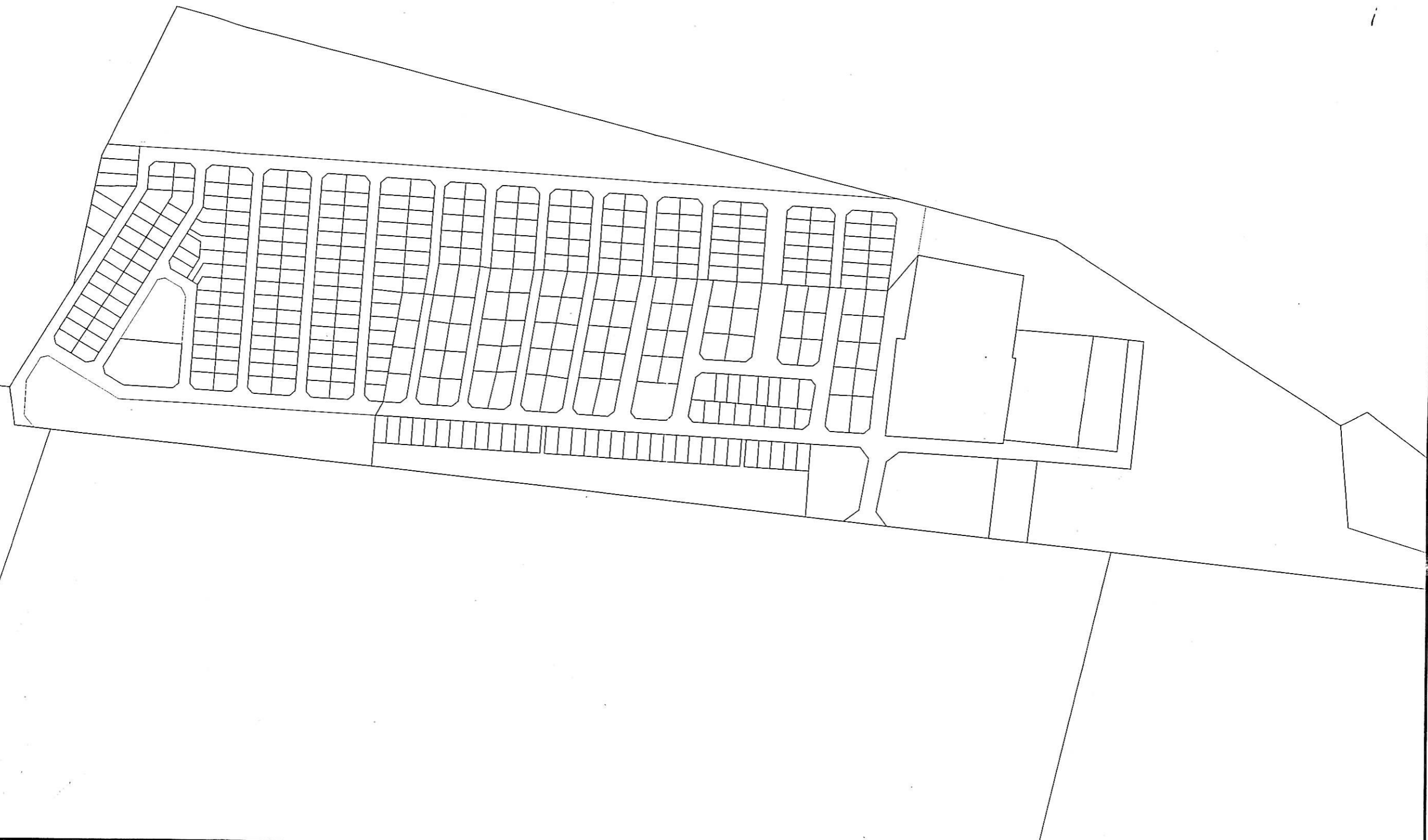
**ORGANOGRAM:
 SANDDRIF TECHNICAL SERVICES OPERATING UNIT**

Scale N. T. S.	Date JUNE 2003
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Drawing number
18961000/D

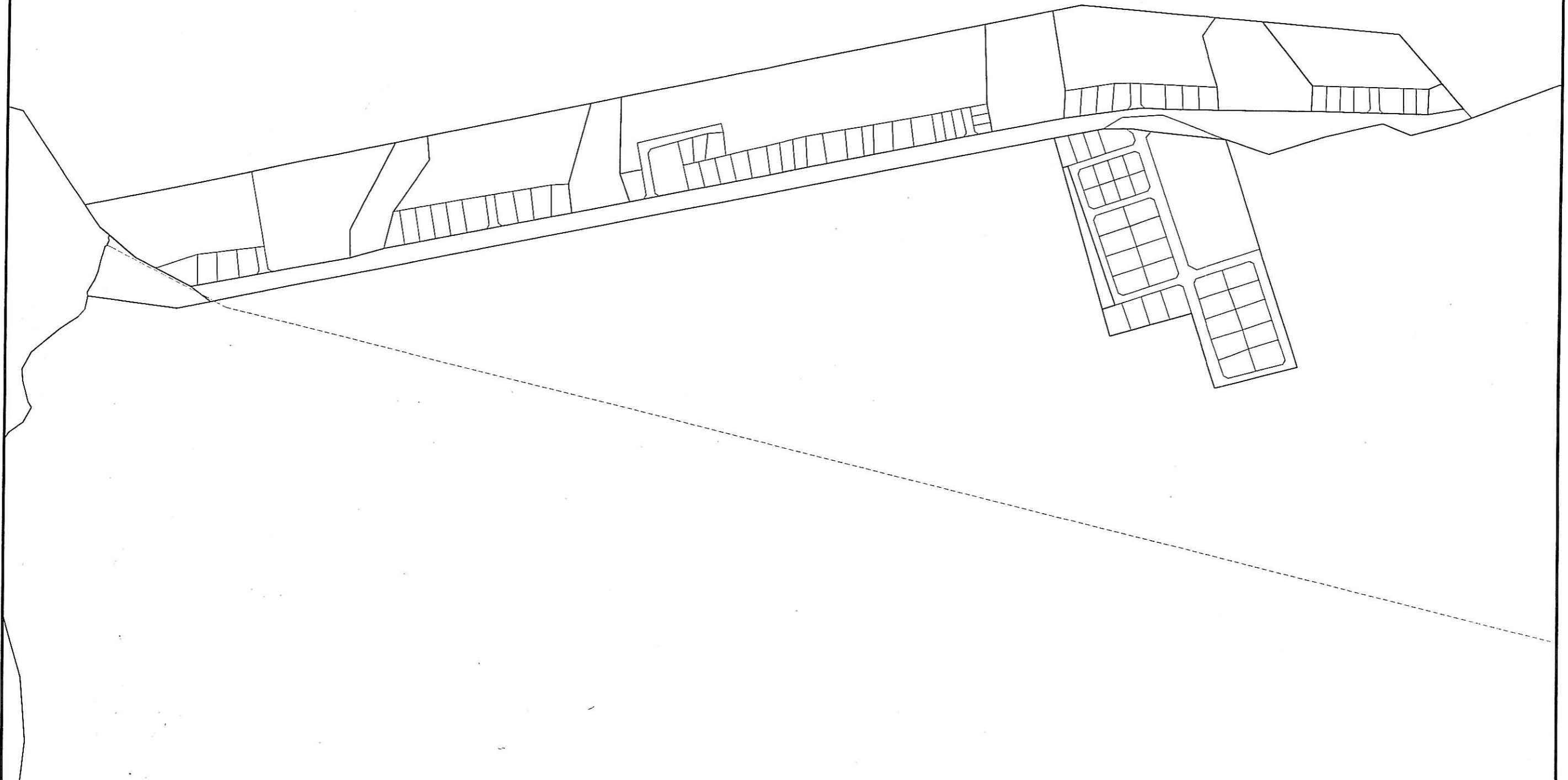






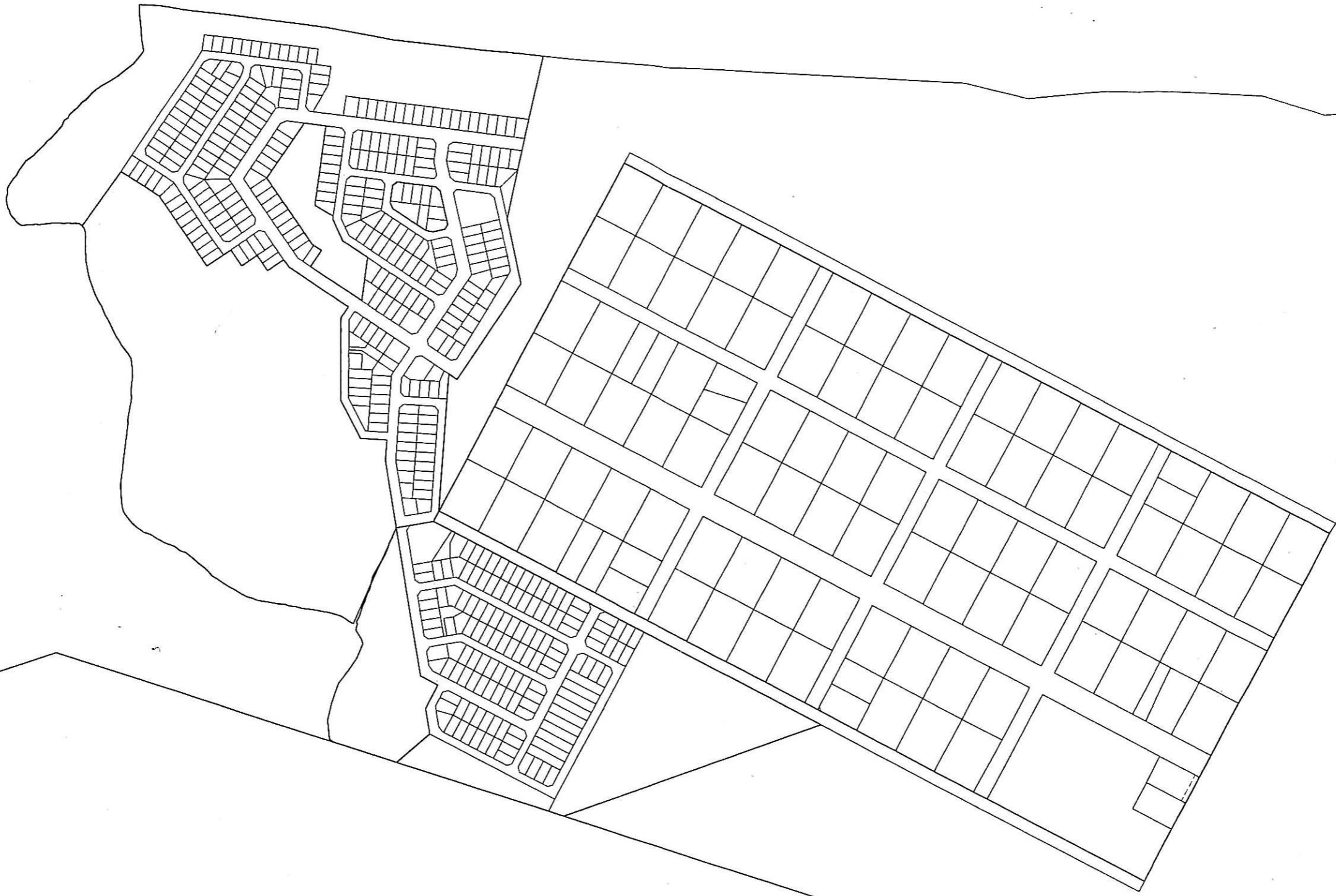
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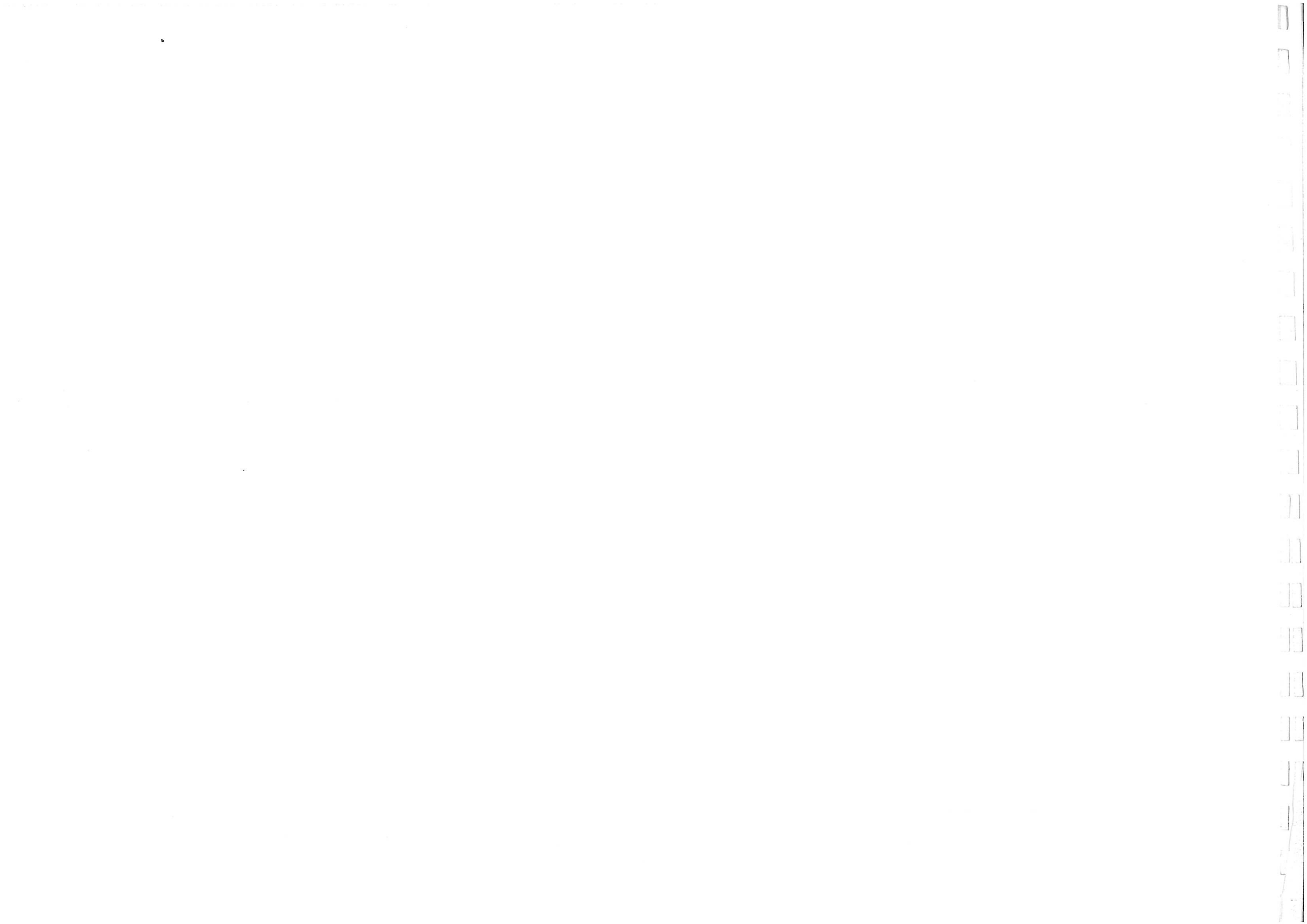


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No.	Date	Checked by	Description																																								



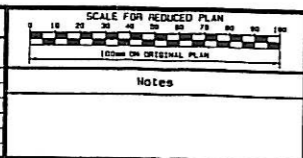


<table border="1"> <thead> <tr> <th colspan="4">Amendment</th> </tr> <tr> <th>No.</th> <th>Date</th> <th>Checked By</th> <th>Description</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>				Amendment				No.	Date	Checked By	Description																	<p>SCALE FOR REDUCED PLAN 100m ON ORIGINAL PLAN</p> <p>NOTES</p>		<p>KWEZI V3 ENGINEERS P.O. Box 7387 Newton Park 6055 Tel: (041) 391-8811 Fax: (041) 394-3798 e-mail: portelizabethv3.co.za</p>		<table border="1"> <tr> <td>Designed</td> <td> </td> </tr> <tr> <td>Drawn</td> <td> </td> </tr> <tr> <td>Checked</td> <td> </td> </tr> </table>		Designed		Drawn		Checked		<table border="1"> <tr> <td>Consulting Engineer</td> <td> </td> </tr> <tr> <td>Date</td> <td> </td> </tr> <tr> <td>Client</td> <td> </td> </tr> <tr> <td>Date</td> <td> </td> </tr> </table>		Consulting Engineer		Date		Client		Date		<table border="1"> <tr> <td>Client</td> <td>KOU KAMMA MUNICIPALITY</td> </tr> </table>		Client	KOU KAMMA MUNICIPALITY	<table border="1"> <tr> <td>Project</td> <td>KOU KAMMA WATER SERVICES DEVELOPMENT PLAN</td> </tr> </table>		Project	KOU KAMMA WATER SERVICES DEVELOPMENT PLAN	<table border="1"> <tr> <td>Drawing description</td> <td>STORMSRIVER LAYOUT PLAN WARD 1</td> </tr> </table>		Drawing description	STORMSRIVER LAYOUT PLAN WARD 1	<table border="1"> <tr> <td>Scale</td> <td>N. T. S.</td> </tr> <tr> <td>Date</td> <td>JUNE 2003</td> </tr> <tr> <td>Drawing number</td> <td>18981000/16</td> </tr> </table>		Scale	N. T. S.	Date	JUNE 2003	Drawing number	18981000/16
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Drawing number	18981000/16																																																																				





Amendment			
No.	Date	Checked by	Description



KWEZI VS ENGINEERS
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 Tel: (045) 391-8811
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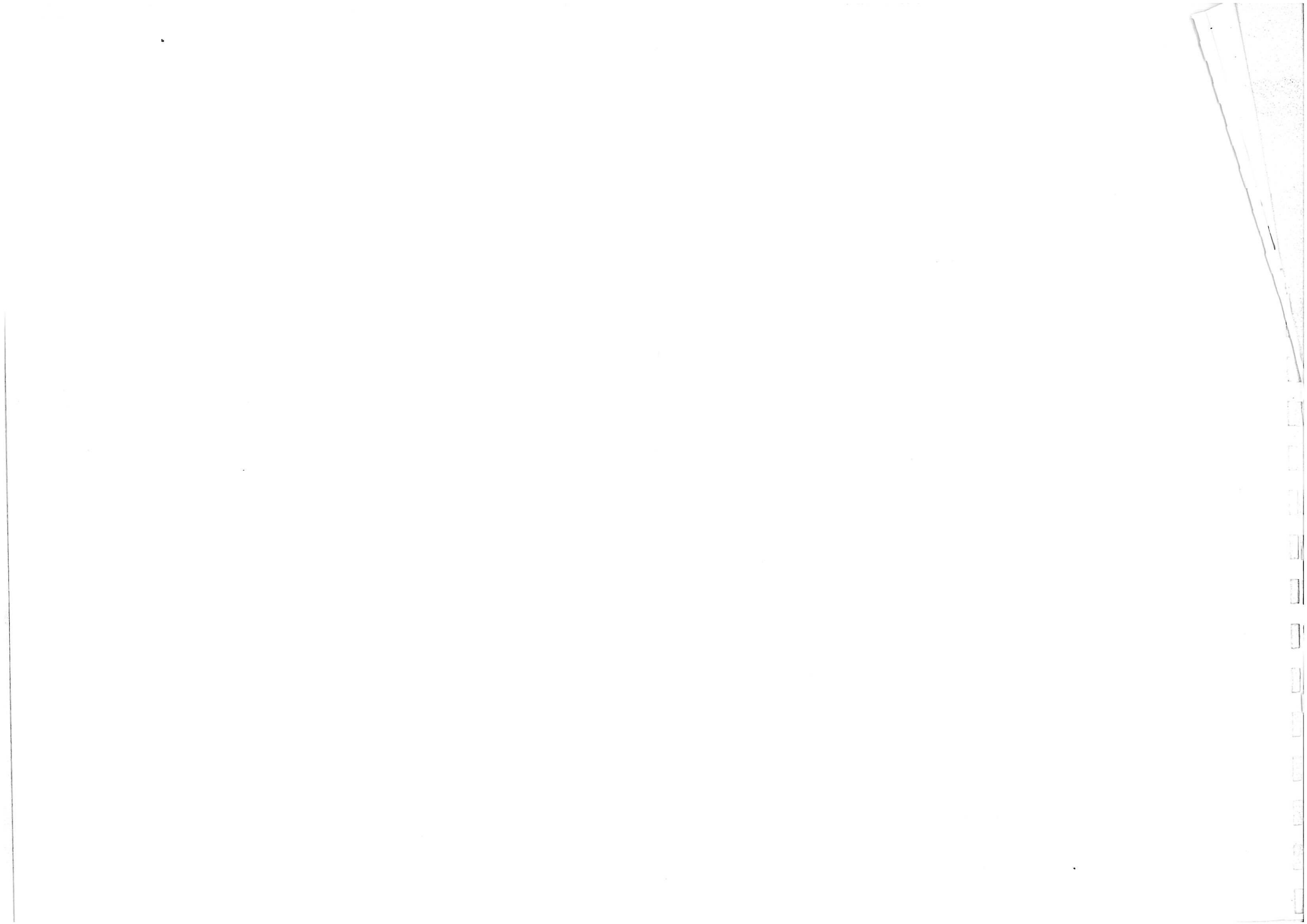
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Drawn		Date	
Checked		Client	
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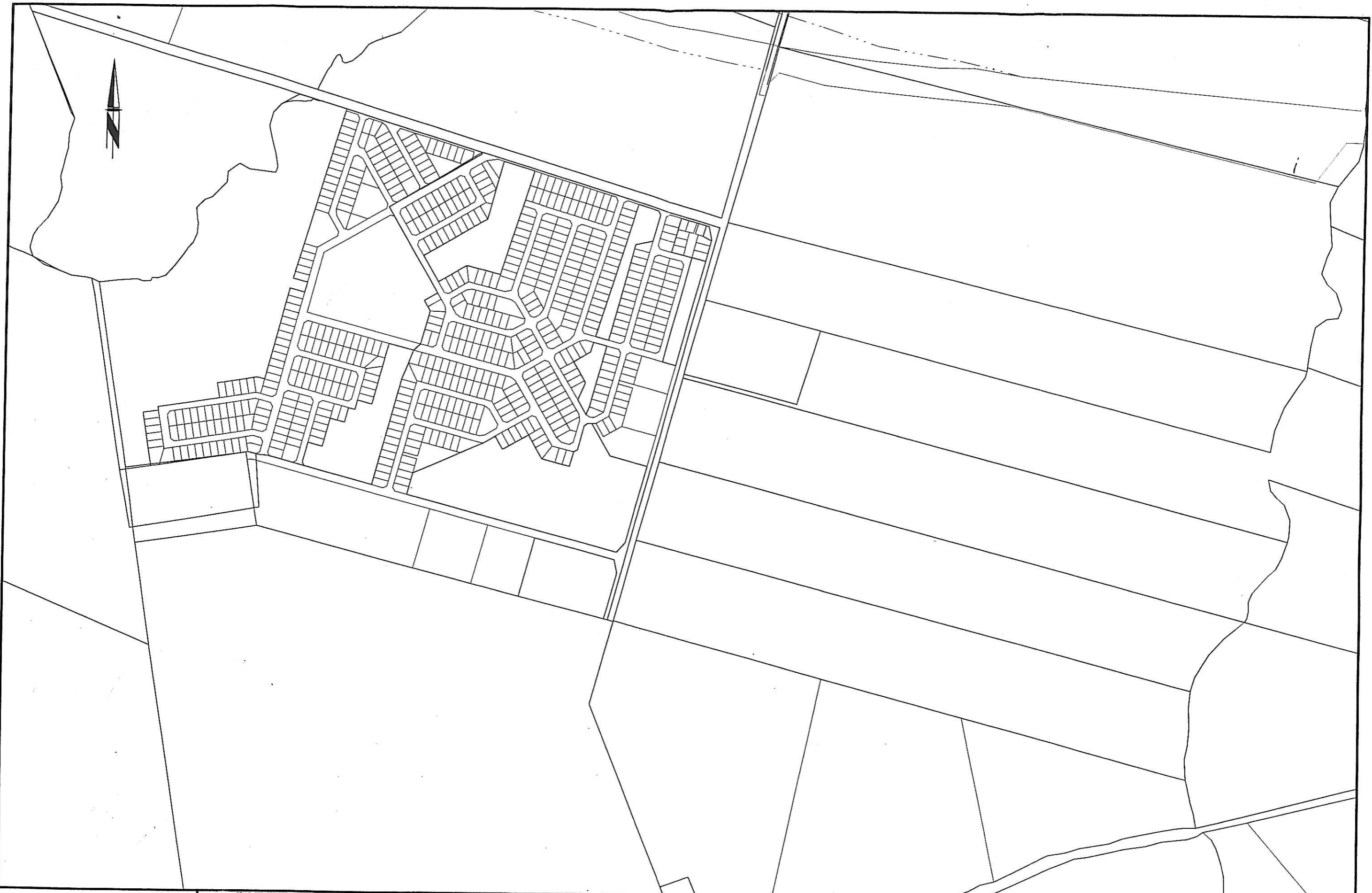
Client
KOU KAMMA MUNICIPALITY

Project
KOU KAMMA WATER SERVICES DEVELOPMENT PLAN

Drawing description
MISGUND LAYOUT PLAN WARD 4

Scale	N.T.S.
Date	JUNE 2003
Drawing number	18961000/13





Amendment				SCALE FOR REDUCED PLAN 0 10 20 30 40 50 60 70 80 90 100 100mm ON ORIGINAL PLAN		KWEZI VS ENGINEERS P.O. Box 7587 Newton Park 6055 Tel: (041) 391-8811 Fax: (041) 364-3798 e-mail: portel@kweziengineers.co.za		Designed	Consulting Engineer	Client	Project	Drawing description	Scale
No.	Date	Checked	Done by	Notes			Drawn	Date	KOU KAMMA MUNICIPALITY	KOU KAMMA WATER SERVICES DEVELOPMENT PLAN	SANDDRIF/NOMPUMELELO LAYOUT PLAN WARD 1	N.T.S.	
							Checked	Client				Date	Date JUNE 2003 Drawing number 18981000/18





Amendment			
No.	Date	Checked by	Description

SCALE FOR REDUCED PLAN

 100m ON ORIGINAL PLAN

Notes

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 e-mail: portelizabeth@kv3.co.za

Designed		Consulting Engineer	
Drawn		Date	
Checked		Client	
		Date	

Client
KOU KAMMA MUNICIPALITY

Project
KOU KAMMA WATER SERVICES DEVELOPMENT PLAN

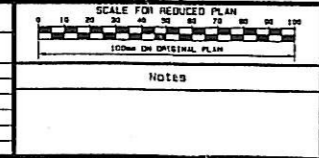
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KOOMANSBOS LAYOUT PLAN WARD 1

Scale	N. T. S.
Date	JUNE 2003
Drawing number	18981000/17





Amendment			
No.	Date	Checked	Done



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 e-mail: port@zibethenv3.co.za



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Consulting Engineer	
Date	
Client	
Date	

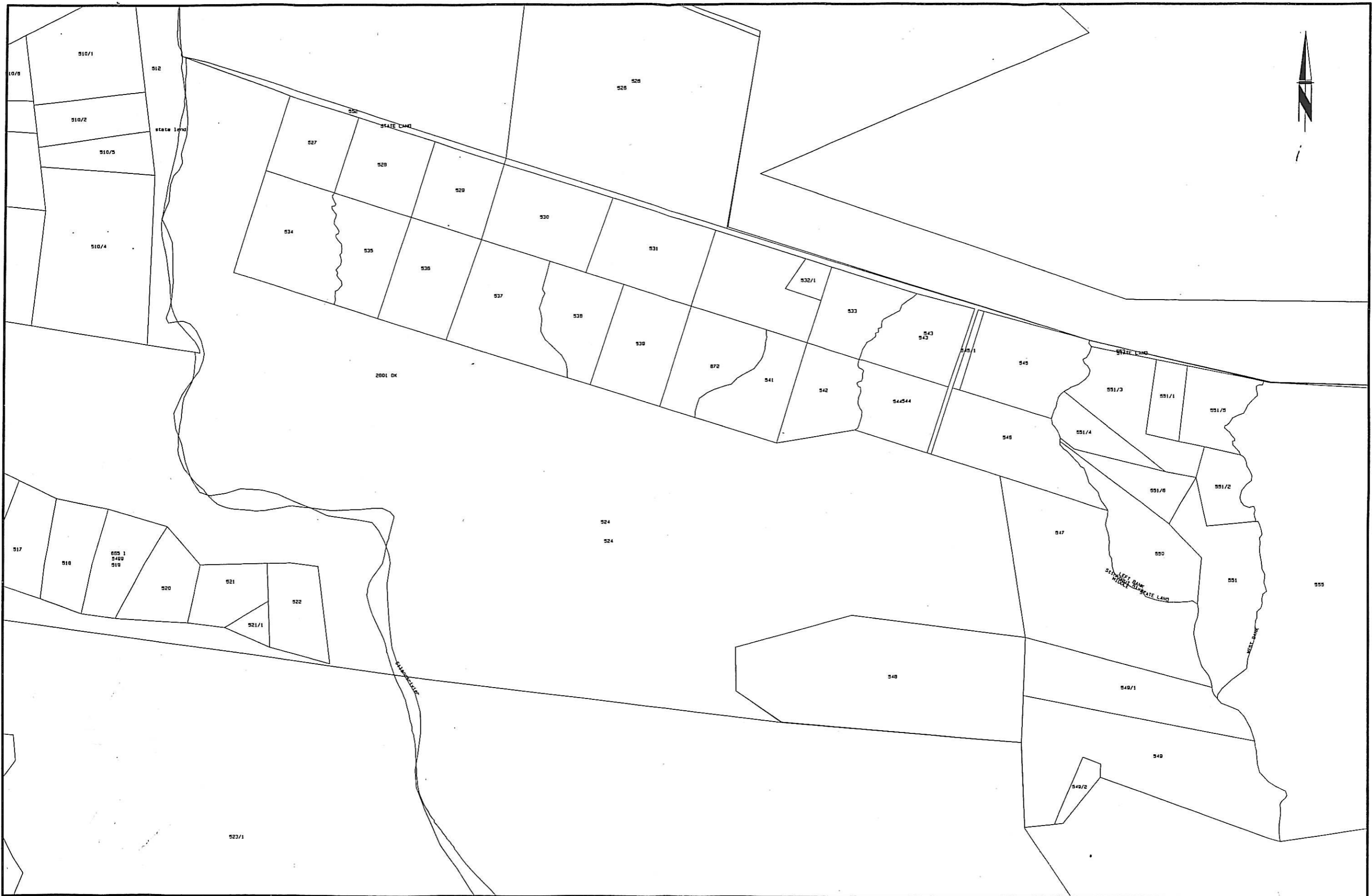
Client
KOU KAMMA MUNICIPALITY


Project
KOU KAMMA WATER SERVICES DEVELOPMENT PLAN

Drawing description
RAVINIA LAYOUT PLAN WARD 3

Scale	1:1250
Date	JUNE 2003
Drawing number	18961000/08



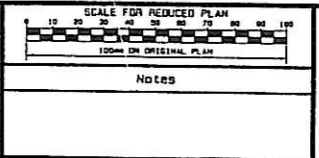


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No.	Date	Checked	Done by	10 20 30 40 50 60 70 80 90 100		P.O. Box 7587 Newton Park 6055 Tel: (041) 321-0511 Fax: (041) 384-3708 e-mail: port@izweethkv3.co.za		KOU AMMA MUNICIPALITY		KOU AMMA WATER SERVICES DEVELOPMENT PLAN		WITELSBOS LAYOUT PLAN WARD 1		N.T.S.	
				100% ON ORIGINAL PLAN				Designed		Consulting Engineer				Date	
								Drawn		Date				JUNE 2003	
								Checked		Client				Drawing number	
										Date				18981000/08	





No.	Date	Checked	Done	Description



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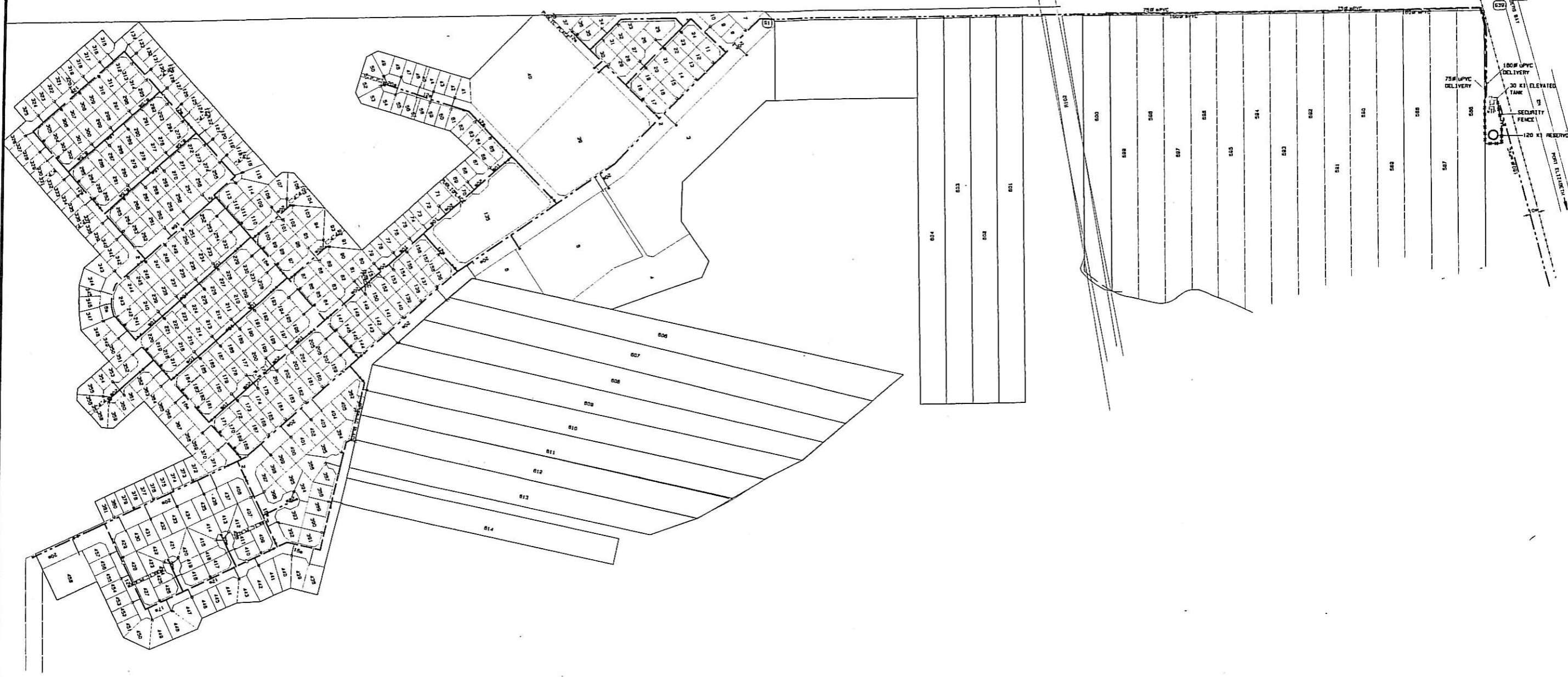
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KOU KAMMA MUNICIPALITY

Project
KOU KAMMA WATER SERVICES DEVELOPMENT PLAN

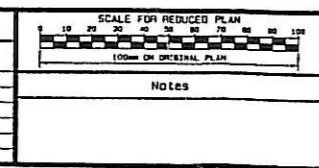
Drawing description
STORMSRIVER LAYOUT PLAN WARD 1

Scale
 N. T. S.
 Date
 JUNE 2003
 Drawing number
18981000/07






Amendment			
No.	Date	Checked by	Description



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Checked		Client	
		Date	

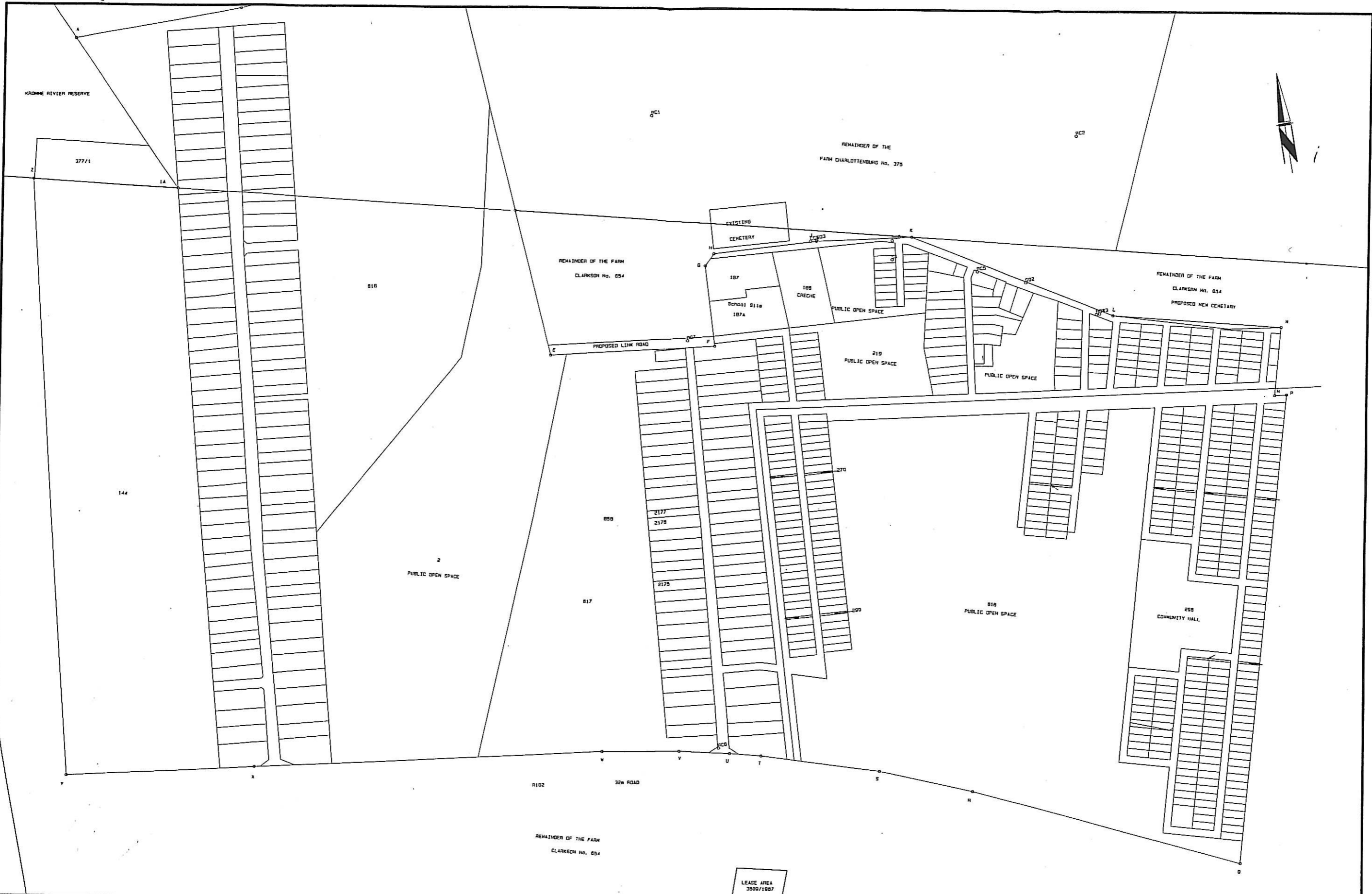
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KOU KAMMA MUNICIPALITY

Project
KOU KAMMA WSDP


Drawing description
WOODLANDS LAYOUT PLAN WARD 2

Scale	N.T.S.
Date	JUNE 2003
Drawing number	18861000/09

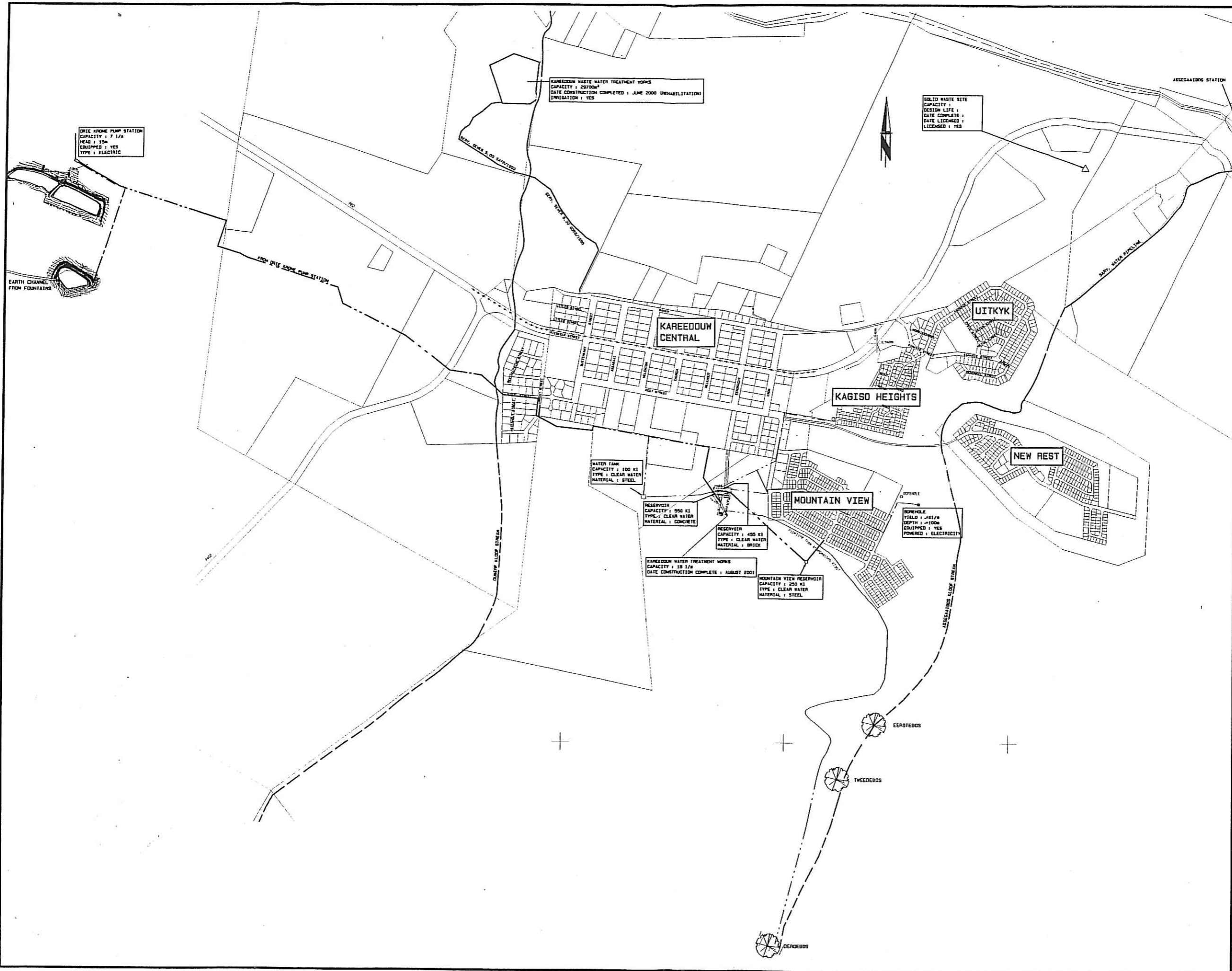




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3000/1007

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Amendment		Description																																										
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Designed		Consulting Engineer																																										
Drawn		Date																																										
Checked		Client																																										
		Date																																										





DRIVE KROMME PUMP STATION
CAPACITY : 7 1/2 m³
HEAD : 15m
EQUIPPED : YES
TYPE : ELECTRIC

KAREEDOUW WASTE WATER TREATMENT WORKS
CAPACITY : 25700m³
DATE CONSTRUCTION COMPLETED : JUNE 2000 (REHABILITATION)
IRRIGATION : YES

SOLID WASTE SITE
CAPACITY :
DESIGN LIFE :
DATE COMPLETE :
DATE LICENSED :
LICENSED : YES

WATER TANK
CAPACITY : 100 K1
TYPE : CLEAR WATER
MATERIAL : STEEL

RESERVOIR
CAPACITY : 550 K1
TYPE : CLEAR WATER
MATERIAL : CONCRETE

RESERVOIR
CAPACITY : 450 K1
TYPE : CLEAR WATER
MATERIAL : BRICK

KAREEDOUW WATER TREATMENT WORKS
CAPACITY : 18 1/2 m³
DATE CONSTRUCTION COMPLETE : AUGUST 2001

MOUNTAIN VIEW RESERVOIR
CAPACITY : 250 K1
TYPE : CLEAR WATER
MATERIAL : STEEL

BONHOLE
FIELD : +21/8
DEPTH : +100m
EQUIPPED : YES
POWERED : ELECTRICITY

SCALE FOR REDUCED PLAN
100m ON ORIGINAL PLAN

Notes

Amendment				
No.	Date	Checked By	Done By	Description

KWEZI V3 ENGINEERS
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Tel: (041) 391-0011
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Designed	Drawn	Checked

Consulting Engineer: _____ Date: _____

Client: _____ Date: _____

Client
KOU KAMMA MUNICIPALITY

Project
KOU KAMMA WATER SERVICES DEVELOPMENT PLAN

Drawing description
KAREEDOUW BULK WATER AND SANITATION LAYOUT PLAN WARD 2

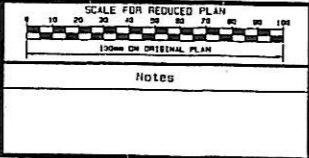
Scale: N. T. S. Date: JUNE 2003

Drawing number
189610Q0/02





Amendment			
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Drawn		Date	
Checked		Client	
		Date	

Client
KOU KAMMA MUNICIPALITY

Project
KOU KAMMA WATER SERVICES DEVELOPMENT PLAN

Drawing description
LAYOUT PLAN: STUDY AREA

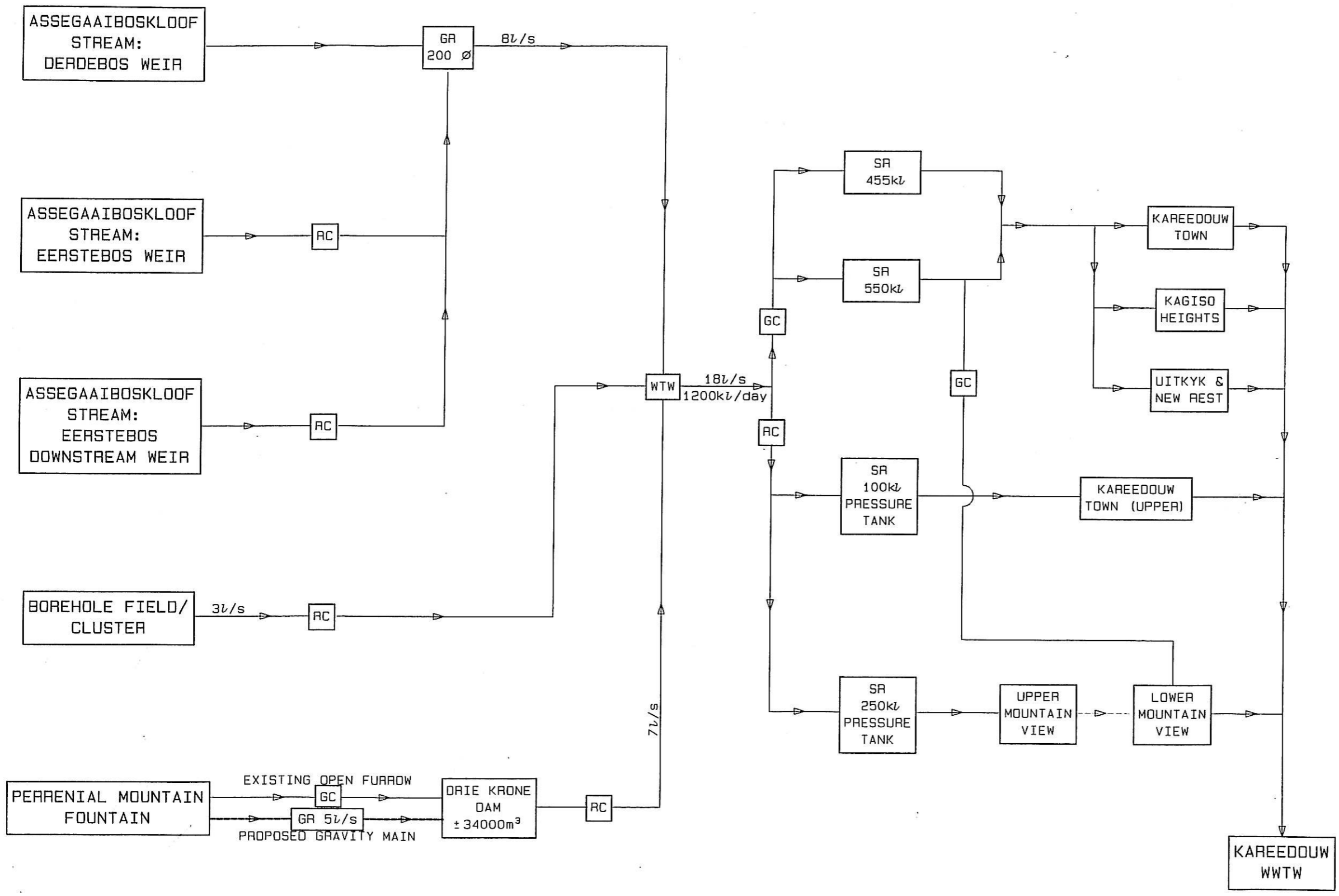
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 Date
 JUNE 2003
 Drawing number
18981080/01





LEGEND

- RC - RISING MAIN LINE
- GC - GRAVITY MAIN LINE
- SR - RESERVOIR FOR REGION
- WTW - WATER TREATMENT WORKS
- WWTW - WASTE WATER TREATMENT WORKS



Notes

Amendment

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Designed	Drawn	Checked

Consulting Engineer _____ Date _____

Client _____ Date _____

Client
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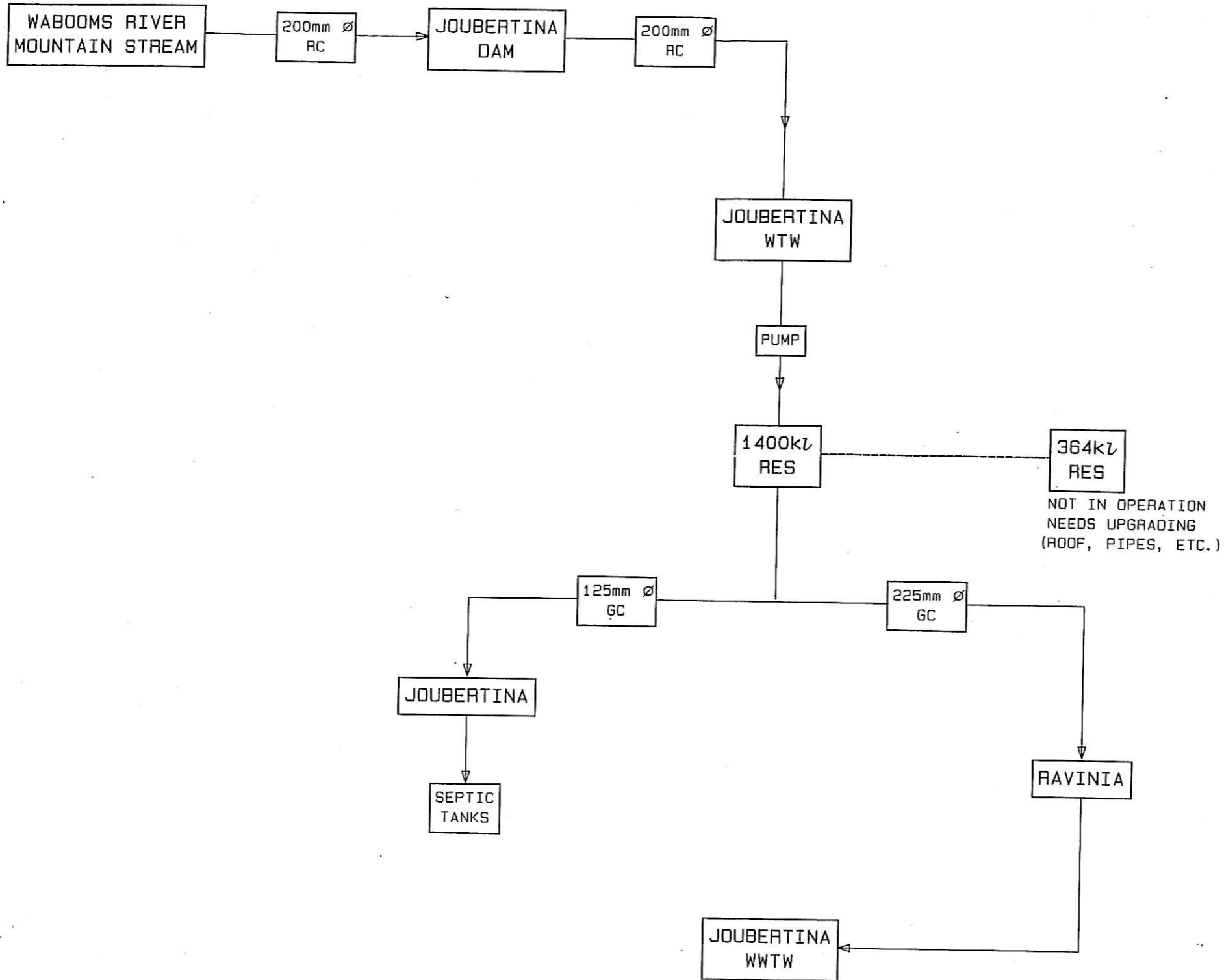
Project
KOU KAMMA WATER SERVICES DEVELOPMENT PLAN

Drawing description
KAREEDOUW BULK WATER AND SANITATION INFRASTRUCTURE SCHEMATIC LAYOUT

Scale N. T. S. Date JUNE 2003

Drawing number
18961000/03





LEGEND

GC - GRAVITY MAIN LINE
 RC - RISING MAIN
 WTW - WATER TREATMENT WORKS
 WWTW - WASTE WATER TREATMENT WORKS

Notes

i

Amendment				
No.	Date	Checked	Done by	Description

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KOUKAMMA WATER SERVICES DEVELOPMENT PLAN

Drawing description

Joubertina BULK WATER AND SANITATION INFRASTRUCTURE

Scale	Date
N. T. S.	JUNE 2003

Drawing number

18961000/05



ANNEXURE C: SETTLEMENT DEFINITIONS

Summary: Settlement categories

Settlement Types	Short Description
Urban	Former TLCs
Dense Settlements	Dense, unproclaimed settlements. Formal and informal.
Villages	Less dense, informal unproclaimed settlements.
Scattered settlements	Low density, scattered informal settlements.
Farmland	Farmland and privately held land.

These settlement types are described in more detail below.

1. Urban Settlements

This category includes formal residential areas where township establishment has taken place and informal settlements which are contiguous with these areas. Here the term 'informal' implies relatively recent settlement: people who have settled on land which they do not own in order to be closer to urban economies. The term 'contiguous' could be taken to mean that the edge of informal area is not further than 5km from the edge of established townships.

1.1 Settlement density

A density criterion could be applied here to deal with small holdings (with no squatters) and to help define a cut-off for those situations where there is a peri-urban fringe which expands continuously outwards from an urban core. This latter situation is often associated with towns adjacent to former homeland areas. In this case land ownership has not been a constraint for people in settling close to urban cores. A typical density limit would be of the order of 5 dwellings per hectare.

1.2 Settlement size

Urban settlements will generally be relatively large (greater than 5 000 people). However, there are some small towns which are below this limit. If a situation is found where an urban area accommodates less than 2 500 people then this should be categorised as a village.

1.3 Institutions

Within the urban category there will generally be an established local council, which has been delegated executive authority to provide services. The offices of this council will typically be within the settlement.

1.4 EA types

The urban category would include the entire census categories called 'urban'. With regard to the 'semi-urban' census category the following guidelines are proposed:

1. 'Semi-urban formal' should be treated as urban, with the size qualification mentioned above.
2. 'Semi-urban informal' is likely to be the hardest to judge, as many areas in this census category may be away from urban cores and thus would fit more appropriately into the dense settlement category or, if they are smaller than 5 000 people, even into the villages category.

3. 'Semi-urban hostels and institutions' would typically be regarded as urban.

4. 'Rural formal and semi-formal' are unusually handled in the census as they refer to formal areas and are given the name 'towns'. If these rural formal and informal settlements are larger than 5 000 people they belong with the urban category. If they are smaller than 2 500 people they belong with villages. If they are of in-between size it becomes a judgement call.

2. Dense settlements

Typically the term dense settlements have been used for large settlements associated with people who were forcibly removed under the apartheid government. These settlements are separated from urban areas by a substantial distance (generally greater than 50 km). They are typically located in former homeland areas and have not had townships proclaimed. They have little of their own urban economic activity and typically do not have central business districts.

2.1 Settlement density

When is a settlement a single settlement and when is it a group of individual settlements?

It is proposed here that if the density of settlement in an area is greater than 0.5 dwellings per hectare (dwellings an average of 150 meters apart) it should be considered a single settlement. However, the nature of dense settlements is that they seldom have densities this low and will almost always have densities of greater than 5 dwellings per hectare and often have densities of greater than 15 dwellings per hectare.

2.2 Settlement size

The dense settlement category is reserved for settlements of greater than 5 000 people.

2.3 Institutions

Dense settlements often do not have local councils with executive responsibility for providing services. Although some may be in this situation the council will seldom have an office within the settlement. From a service provider point of view dense settlements typically require more formal service provision arrangements, since community-based management is not well suited to settlements of this size. Their size generally warrants some formally employed service provider staff being based in the settlement.

2.4 EA types

The dense settlement category would include some of the following:

1. 'Semi-urban informal' (see discussion under urban above):

2. 'Rural tribal villages and informal'. If these settlements are larger than 5 000 people they should be included under dense settlements.

3. Villages

This category is primarily used for traditional settlements in former homeland areas. However, small towns of less than 500 people and small informal settlements are also included. (The separation between 'traditional' and 'informal' settlement relates primarily to the history of the settlement, but also to the nature of the dwellings).

3.1 Settlement density

The density limit for a single settlement is similar to those for dense settlements. But villages will often have relatively low densities, in the range of 0.5 to 5 dwellings per hectare. However, higher densities do not preclude a settlement from being categorised as a 'village'.

3.2 Settlement size

The term 'village' is reserved for settlements of between 500 and 5 000 people.

3.3 Institutions

Villages typically do not have local councils with executive responsibility for service provision, although this is not necessarily always the case. Regardless of the local authority's situation, service provision is frequently best performed in such settlements through informal, community-based arrangements. The main reasons for this are the distance from formal service provider offices, and the low viability of having a formally employed person based in the village.

3.4 EA types

This category would include some of the following:

1. 'Urban' settlements which are smaller than 2 500 people.

2. 'Semi-urban formal' if it is has between 500 and 2 500 people in the settlement.
3. 'Semi-urban informal, if they are between 500 and 5 000 people in size.
4. 'Rural formal and semi-formal'. As mentioned under 'dense settlements', if these rural formal and informal settlements are larger than 5 000 people they belong with the 'urban' category. If they are smaller than 2 500 people they belong with 'villages'. If they are of in-between size it becomes a judgement call.
5. 'Rural tribal villages and informal', if these settlements are 500 to 5 000 people in size.

4. Scattered settlements

This term is reserved for all settlements which are less than 500 people in size, excluding commercial farms.

4.1 Settlement institutions

In scattered settlements the situation with service provider arrangements is similar to that with villages. However, the establishment of even community-based arrangements becomes difficult.

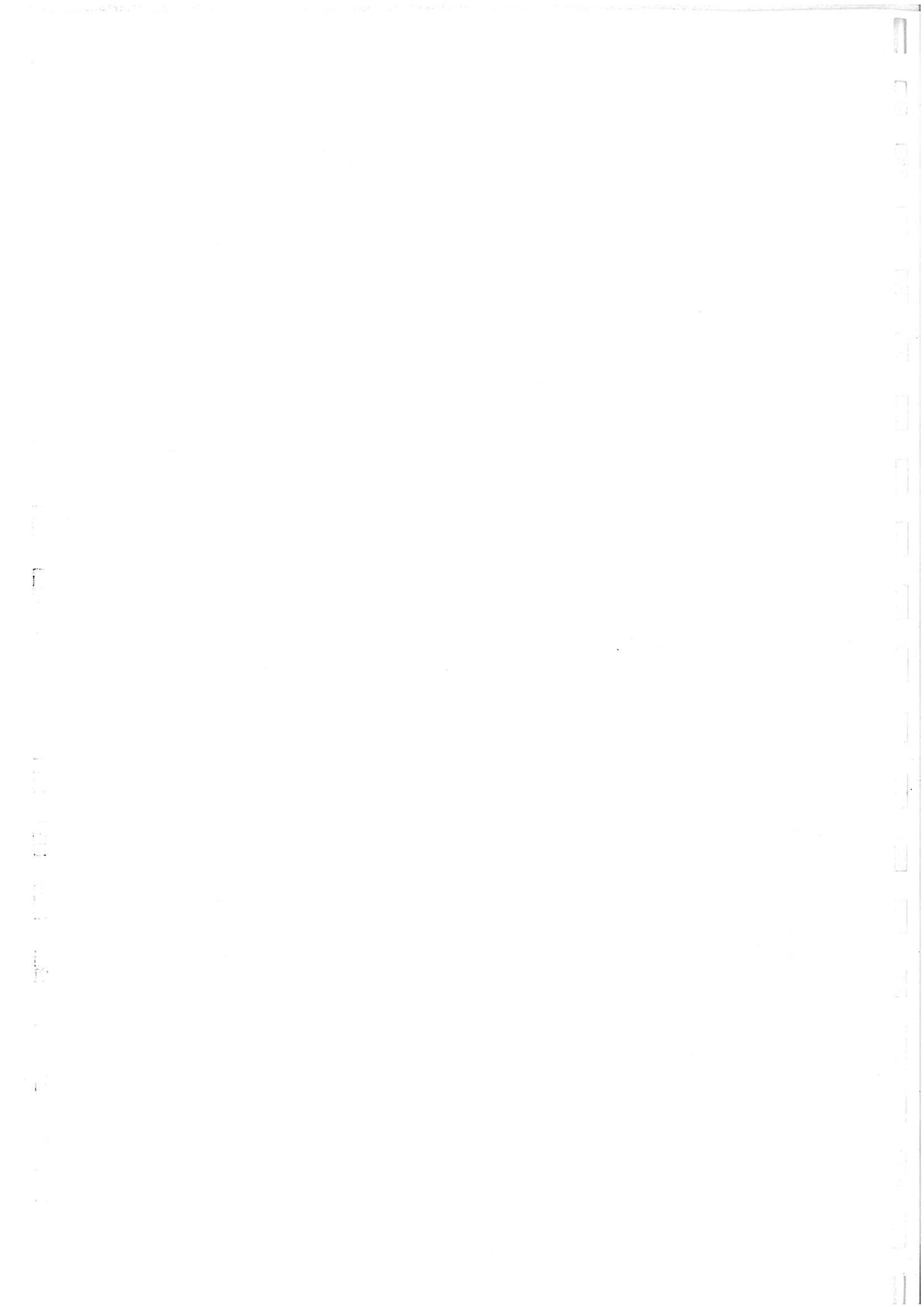
5. Farmland

This is a sub-category of 'scattered' to provide for people living on commercial farms or associated with other commercial activity. Settlement sizes are lower than 500 people and/or densities are lower than 0.5 dwellings per hectare. This category includes a mix of land owners and tenants, with the assumption that tenants are employed on the farm or by some other commercial entity.

5.1 Institutions

There is a specific institutional arrangement associated with this category, in that the owner of the commercial enterprise is responsible for service provision.

(This annexure is based on the settlement type definitions of the District Services Model Manual, Version 1.1. The District Services Model is one of a number of infrastructure planning models that has been developed for the Development Bank of Southern Africa).



ANNEXURE G
USEFUL CONTACTS

ANNEXURE C

LOCAL CONTACTS

USEFUL CONTACTS

Province	Coordinator	Telephone	Fax	Cell	e-mail
Head Office	Bev Pretorius	012-336-8290	012-321-1193	082-809-5102	pretoriusb@dwaf.gov.za
	Maxima Ranamane	012-336-8815		082-806-3901	obd@dwaf.gov.za
	Sorrious Manele	012-336-8284		082-809-2286	maneles@dwaf.gov.za
	Jarita du Plessis	012-336-8290		072-278-7487	duplessisj@dwaf.gov.za
Eastern Cape	Mfusi Mpendu	043-643-3011	043-642-1136	082-805-7636	mpendud@dwaf.ecape.gov.za
Free State	Priscilla Mohapi	051-430-3134	051-430-8146	082-805-8590	mohapip@dwaf.ncape.gov.za
Gauteng	Johann Enslin	012-392-1421	012-392-1407/8	082-805-3879	enslinj@dwaf-nuc.pwv.gov.za
KwaZulu Natal	Thulani Mchunu	035-474-4109	035-474-1307	082-808-9922	mchunut@dwaf.kzntl.gov.za
	Busiswe Grace Dhludla	034-212-3571	034-218-1024	082-803-3307	dludlab@dwaf.kzntl.gov.za
Mpumalanga	Nancy Ngobeni	013-759-7340	013-755-1678	082-806-5322	ngobenin@dwaf.mpu.gov.za
Northern Cape	Kobus Streuders	053-831-4125	053-831-5682 /4534	082-804-2755	streudersk@dwaf.ncape.gov.za
Northern Province	Takalani Ramabulana	015-290-1351	015-295-3250	082-802-2947	ramabut@dwaf-ptg.pwv.gov.za
North West	Ishmael Khumoeng	018-384-3270	018-392-2998	082-806-8857	2ci@dwaf.pwv.gov.za
Western Cape	Simpiwe Mashicila	021-950-7100	021-946-3666	082-805-6039	maggass@dwaf-wcp.wcape.gov.za



ANNEXURE H

REFERENCES

ANNEXURE II

REFERENCES

Section	Publications guides (Guidelines on appropriate quality of domestic water supplies.)	Where to find	Contact Details
5	Permissible Utilisation and Disposal of Sewage Sludge, Edition 1, 1997	→ Water Research Commission	Head Office Pretoria Tel: 012 330 0340
5	Procedures to assess effluent discharge impacts, WRC Report No TT 64/94, first Edition 1995.	→ Water Research Commission	Head Office Pretoria Tel: 012 330 0340
9	Management Guidelines for Water Service Institutions (Urban), Palmer Development Group. Ref TT 98/98: Module 1 Introduction to Organisational Arrangements.	→ Water Research Commission	Head Office Pretoria Tel: 012 330 0340
3, 10, 11	Management Guidelines for Water Service Institutions (Urban), Palmer Development Group. Ref TT 98/98: Module 3 Consumer Profile and Demand for Services	→ Water Research Commission	Head Office Pretoria Tel: 012 330 0340
11	Management Guidelines for Water Service Institutions (Urban), Palmer Development Group. Ref TT 98/98: Modules 4 and 5 Tariff Setting	→ Water Research Commission	Head Office Pretoria Tel: 012 330 0340
7	Management Guidelines for Water Service Institutions (Urban), Palmer Development Group. Ref TT 98/98: Modules 6 and 7 Reporting Procedures for Water and Sanitation Services	→ Water Research Commission	Head Office Pretoria Tel: 012 330 0340
3, 4, 7	Census 1996	→ Statistics South Africa	Head Office Pretoria Tel: (012) 310-8911 Fax: (012) 322-3374 E-mail: info@statssa.pwv.gov.za
4	Municipal Service Options: A Guideline for Local Authorities	→ National Department of Local and Provincial Government	Head Office Pretoria 012 334 0600 www.local.gov.za
11	Municipal Tariff Guidelines	→ National Department of Local and Provincial	Head Office Pretoria



ANNEXURE H: REFERENCES

1. PUBLICATIONS

Section	Publications	Where to find	Contact Details
3, 4, 5, 6, 8, 10, 11	National Water Audit	→ DWAF Water Services Water Regulations Section 10	DWAF Water Services Directorate Intervention and Operational Support Tel; 012 336 6509
3, 4, 7	First Order Strategy	→ DWAF Water Services Available on CD	DWAF Water Services Tel: 012 336 7500
4	South African Water Quality Guidelines. Vol 1-6. Second Edition, 1996	→ DWAF Document Available from Web Site	Head Office Pretoria Tel: 012 336 7500 www.dwaf.gov.za
5	Minimum Requirements for the Water Monitoring at Waste Management Facilities, Second Edition, 1998.	→ DWAF Document Available from Web Site	Head Office Pretoria Tel: 012 336 7500 www.dwaf.gov.za
5	Minimum Requirements for Waste Disposal by Landfill, Second Edition, 1998	→ DWAF Document Available from Web Site	Head Office Pretoria Tel: 012 336 7500 www.dwaf.gov.za
5	Minimum Requirements for Handling, Classification and Disposal of Hazardous Waste, Second Edition, 1998.	→ DWAF Document Available from Web Site	Head Office Pretoria Tel: 012 336 7500 www.dwaf.gov.za
5	Permissible utilisation and disposal of sewage, Sewage Sludge, 1997	Department of Health Library	DOH Library Tel: 012 312 0809/7
5	V1.1, Managing the Water Quality Effects of Settlement; The National Strategy, First Edition, April 1999.	→ DWAF Document Available from Web Site	Head Office Pretoria Tel: 012 336 7500 www.dwaf.gov.za
5	V1.2, Managing the Water Quality, Effects of Settlement; Vol. 2, Guideline for Implementation, June 1999.	→ DWAF Water Quality Management → Spoke with Manda Hinsch – they are planning to combine this document and the above on a CD which will be available from WQ	Head Office Pretoria Tel: 012 336 7500 www.dwaf.gov.za
5	<u>Aide Memoire for the preparation of a water quality report to support the application for licenses for sewage purification works in terms of the requirement</u>	→ DWAF Document Available from Water Quality Management Web Site	Head Office Pretoria Tel: 012 336 7500 www.dwaf.gov.za

Section	Publications	Where to find	Contact Details
		Local and Provincial Government	012 334 0600 www.local.gov.za
5	SABS Ref: 241 – 2001 Specification Drinking Water: Guide to correct testing of Water Quality.	↪ SABS <i>Available by order or direct purchase</i>	Head Office Pretoria Tel: 012 428 6925
6	SABS Ref: 306 – 1999 The Management of Potable Water in Distribution Systems.	↪ SABS <i>Available by order or direct purchase</i>	Head Office Pretoria Tel: 012 428 6925
6	Water Conservation and Water Demand Management Strategy for the Water Services Sector: 2000	↪ DWAF ↪ Water Conservation	DWAF Chief Directorate Water Use and Conservation Tel: 012 336 8086 www.dwaf.gov.za

2. LEGISLATION

Section	Legislation	Where to find	Contact Details
3, 4, 5, 6, 7, 8, 9, 10, 11	Water Services Act	↪ DWAF Web Site ↪ DWAF Library ↪ National Library of South Africa (NLSA)	www.dwaf.gov.za DWAF Library Tel: 012 336 8412/14/15 NLSA Pretoria Tel: 012 321 8931
5	National Water Act	↪ DWAF Web Site ↪ DWAF Library ↪ National Library of South Africa (NLSA)	www.dwaf.gov.za DWAF Library Tel: 012 336 8412/14/15 NLSA Pretoria Tel: 012 321 8931
5	Regulation 2834 of 1985 of National Water Act (Act 54 of 1956).	↪ DWAF Library ↪ National Library of South Africa (NLSA)	DWAF Library Tel: 012 336 8412/14/15 NLSA Pretoria Tel: 012 321 8931
5	Regulation 991 of 1984 of National Water Act (Act 54 of 1956) – Government Gazette, 18 May 1984 No 9225.	↪ DWAF Library ↪ National Library of South Africa (NLSA)	DWAF Library Tel: 012 336 8412/14/15 NLSA Pretoria Tel: 012 321 8931

3. MAPS

Section	Maps	Where to find	Contact Details
3	Ground Water Harvesting Potential Map	↪ DWAF Geohydrology Maps Available from Web Site	Head Office Pretoria Tel: 012 336 7849 www.dwaf.gov.za
4	Hydrological Map Series of the RSA	↪ DWAF Contact Details Available from Web Site	Head Office Pretoria Tel: 012 336 7500 www.dwaf.gov.za
9	National Ground Water Data Bank – Geo-	↪ DWAF Geohydrology Contact Details and Map	Head Office Pretoria