Water Services Development Plan

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A: SOURCE DESCRIPTION

District Municipality:	Amatole		Chris Hani	✓	O.R Tambo	
	Ukhahlamba		Cacadu		Alfred Nzo	

Local Municipality: INKWANCA

Institution where Information is held: KWEZI V3 ENGINEERS

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Pump Testing Data		✓		
Chemical Water Analysis Data		✓		
Geohydrological Data	✓			✓
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185050QO

DEPARTMENT: WATER AFFAIRS AND FORESTRY
REPUBLIC OF SOUTH AFRICA

WATER SERVICES DEVELOPMENT PLAN

INKWANCA LOCAL MUNICIPALITY

DRAFT

December 2002

THE MUNICIPAL MANAGER
Inkwanca Local Municipality
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INKWANCA LOCAL MUNICIPALITY
WATER SERVICES DEVELOPMENT PLAN FOR THE TOWNS OF MOLTENO AND STERKSTROOM
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Our ref : 185050QO

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INKWANCA LOCAL MUNICIPALITY
WATER SERVICES DEVELOPMENT PLAN FOR THE TOWNS OF MOLTENO AND STERKSTROOM

A. INTRODUCTION

A.1 Abbreviations

The Local Municipality, which does not have Water Services Authority status, is required to prepare a Water Sector Plan according to the Water Services Act (Act 108 of 1997,Section 13). All Local Municipalities will receive Water Services Authority Status in 2003, after which it will be a requirement from the Local Municipality to prepare a Water Services Development Plan.

Water Services Development Plans due to its nature are technical orientated documents. The following abbreviations are used in this Water Services Development Plan:

- WSP - Water Sector Plan
- WSDP - Water Services Development Plan
- DWAF - Department of Water Affairs and Forestry
- LM - Local Municipality (Inkwanca Local Municipality)
- CHDM - Chris Hani District Municipality
- WSA - Water Services Authority
- IDP - Integrated Development Plan
- LDF - Local Development Forum (IDP steering committee)
- PSC - Project Steering Committee
- LDO - Local Development Objective
- WPP - Water Purification Plant
- WWTW - Waste Water Treatment Works
- N/A - Not applicable
- N.A. - Not available

A.2 Background

A WSDP is a legal requirement. The real value of preparing a WSDP lies in the need to plan for water services, whereby key targets are set for a five-year period.

Since the Municipal Systems Act of 2000 requires all municipalities to produce an Integrated Development Plan (IDP), Local Municipalities (LM) will be identifying strategies and projects to address their constituency's development needs.

The main reason for preparing a WSDP is to progressively ensure efficient, affordable, economical and sustainable access to water services. This requires the WSA to understand the water services business, make key decisions about water services targets, and towards achieving those targets.

The purpose of the consulting service is to provide support to the Inkwanca Local Municipality Water Services Development Plan process so that:

- the process supports and is aligned with the Municipality's IDP process;
- the WSDP meets the requirements of the Water Services Act (Act 108 of 1997);
- Capacity is built with the Local Municipality to undertake water sector planning processes within a framework of informed decision making.

A.3 Site description

Molteno together with Sterkstroom formed the Inkwanca Local Municipality during the municipal elections held during December 2000. Inkwanca Local Municipality is situated in the North-eastern Cape approximately 413 km from Port Elizabeth, 347 km from Bloemfontein, 325 km from East London and 82 km from Queenstown. The presiding District Municipality, in which Inkwanca Local Municipality is located, is the Chris Hani District Municipality with its main offices in Queenstown.

Molteno is the principal town of the Inkwanca Local Municipality and surrounded by the towns of Steynsburg (±58km), Sterkstroom (±26km), Burgersdorp (±62km) and Dordrecht (±74km). Sterkstroom, the other town in Inkwanca Local Municipality, is surrounded by the towns of Queenstown (±56km), Molteno (±26km), Tarkastad (±66km) and Dordrecht (±52km).

The general climatic conditions in the Inkwanca Local Municipality vary from very cold winters to hot summers.

The co-ordinates of Molteno are : Latitude - 26° 22' 00"
Longitude - 31° 26' 00 "

The co-ordinates of Sterkstroom are : Latitude - 31° 32' 45"
Longitude - 26° 32' 42"

Refer to attached drawing no. 185050QO/1 and 185050QO/2 for the locality plans of both towns.

A.4 Definitions

Water Services Development Plan Definition

A Water Services Development Plan is a plan to progressively ensure efficient, affordable, economical and sustainable access to water services. It is the product of the water services development process. It is a sectoral plan, which deals with socio-economic, technical, financial, institutional and environmental issues as they pertain to water services. It also functions as a management tool in ensuring the provision of total, effective and sustainable water services.

Integrated Development Plan Definition

An Integrated Development Plan is the process through which a Municipality can establish a strategic development plan, for the short, medium and long-term. It is a principal strategic planning instrument that guides and informs all planning, budgeting, managing and decision-making in a municipality.

B. PROJECT DELIVERABLES

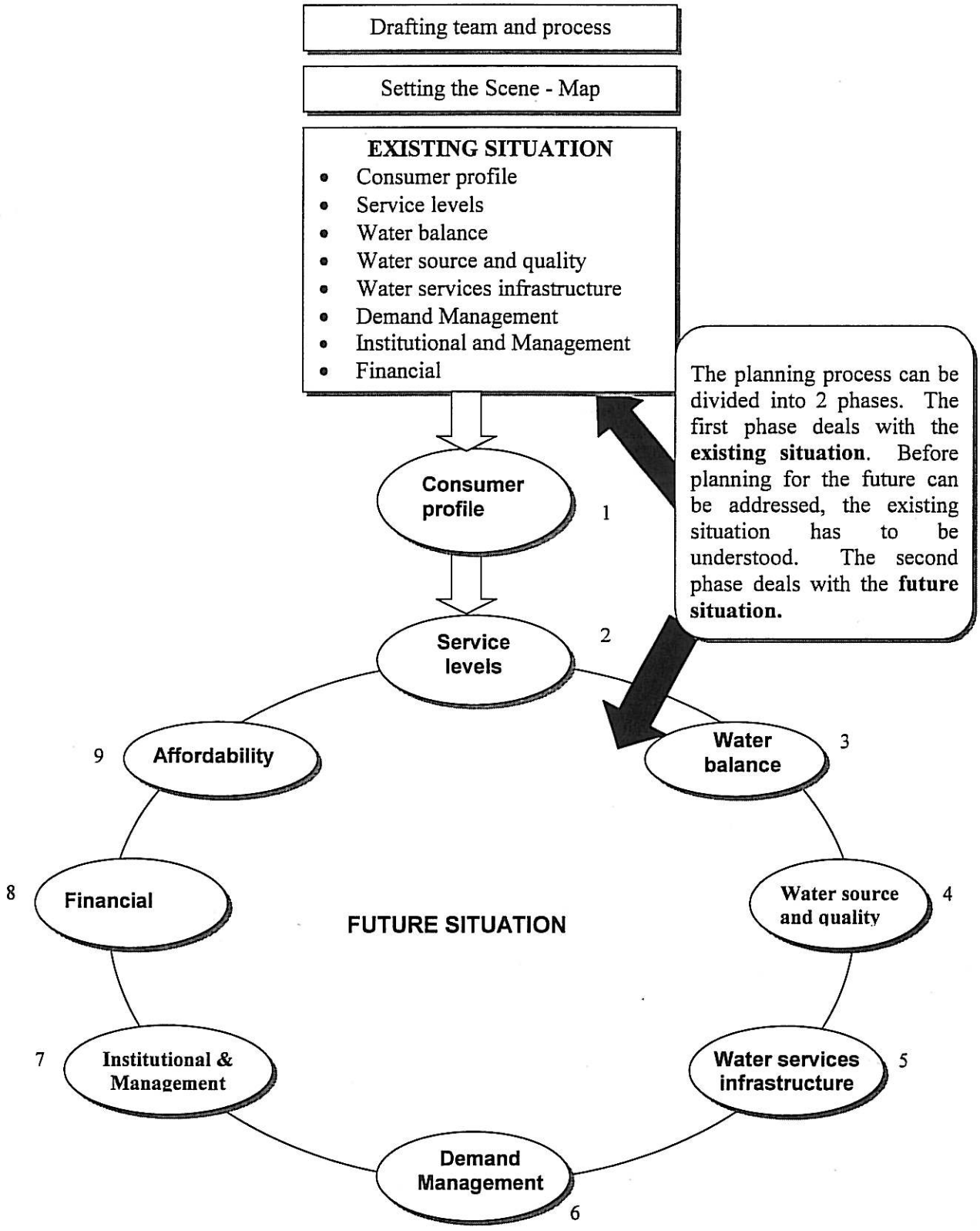
B.1 Phases of WSDP project

Kwezi V3 Engineers were responsible for compiling the WSDP according to the Department of Water Affairs and Forestry Guidelines for Water Services Authorities. A WSDP was prepared for Inkwanca Local Municipality as the LM will receive Water Services Authority status in 2003. The following 11 steps in co-operation with the Inkwanca Local Municipality were followed to compile the draft WSDP, they are:

- Drafting team and process.
- Compiling a map of existing situation.
- Compiling the consumer profile.
- Determining the service levels required/afforded.
- Completing the water balance.
- Investigating water sources and quality.
- Compiling existing and future water infrastructure demand (map).
- Compiling water demand management proposals.
- Determining institutional and management proposals.
- Financing of proposals and current finance structures.
- Determining affordability of proposals.

B.2 Scope of work and details

The following diagram shows the different steps in the WSDP planning process:



B.3 METHODOLOGY

B.3.1 Data Collection

The data collection was done according to the chapters in DWAF's Guidelines for Water Services Authorities for WSDP. The following data was collected as a unit regarding Water Services in the Inkwanca Local Municipality:

- Administration
- IDP and WSDP Goals
- Water Services Institutional Arrangements Profile
- Customer Services Profile
- Financial Profile
- List of Project

The following data due to its physical nature and impact was collected separately for the towns of Molteno and Sterkstroom:

- Physical and Socio-economic Profile
- Service Level Profile
- Water Resource Profile
- Water Conservation / Demand Management
- Water Services Infrastructure Profile
- Water Balance

B.3.2 Draft WSDP

The successive chapters in this draft WSDP report are numbered according to the Preparation Guide of DWAF's WSDP Guidelines for Water Services Authorities (as requested by DWAF). The data that was collected as unit as set out above in paragraph B.3.1 is discussed in the successive chapters according to the Preparation Guide of DWAF's WSDP Guidelines for Water Services Authorities. The data that was collected separately for Molteno and Sterkstroom as set out above in paragraph B.3.1 is discussed in the successive chapters according to the Preparation Guide of DWAF's WSDP Guidelines for Water Services Authorities, the only difference is that either a (A) or (B) will be noted at the end of the chapter. The data collected for Molteno is denoted by (A) and the data collected for Sterkstroom is denoted by (B).

1 ADMINISTRATION

1.1 Name and Address of WSA (Only from 2003)

Name and Address of WSA

1. Name	Inkwanca Local Municipality
2. Address	P.O. Box 1 Molteno 5500
3. DM Reference No	Not available

1.2 Contact person/persons

Name	Position	Tel. Number	E-mail
N A Ncube	Municipal Manager	(045) 967 0021	ncube@moltenosa.gov.za
E T Zini	Works superintendent	(045) 966 0008	ncube@moltenosa.gov.za
N Simanga	Credit control	(045) 967 0021	ncube@moltenosa.gov.za
H Steynberg	Engineer	(041) 391 8811	hsteynberg@kv3.co.za
N Tukani	Technician	(041) 391 8811	ntukani@kv3.co.za

1.3 WSDP drafting team

Since the WSDP needs to be integrated with the IDP, it is important that there are WSDP and IDP representatives on both the WSDP and the IDP drafting teams, which are as follows:

Name	Organisation	Telephone number
E T Zini	Inkwanca Local Municipality	(045) 966 0008
S Simanga	Inkwanca Local Municipality	(045) 967 0021
A N Ncube	Inkwanca Local Municipality	(045) 967 0021
B Geyer	Inkwanca Local Municipality	(045) 966 0008
B van Zyl	Inkwanca Local Municipality	(045) 967 0021
N Tukani	Kwezi V3 Engineers	(041) 391 8811
H Steynberg	Kwezi V3 Engineers	(041) 391 8811

1.4 IDP drafting team

The IDP Representative Forum was represented by different political social organisations. The following is the list of the IDP Steering Committee:

Name	Organisation	Telephone number
Mr. N A Ncube	Municipality (Municipal Manager)	(045) 967 0021
Cllr. M E Yekani	Municipality (Mayor)	(045) 967 0021
Cllr. N P Makhalima	Municipality (Councillor)	(045) 967 0021
Ms N F Koto	Municipality (Finance Officer)	(045) 967 0021
Ms S D Mphokela	Municipality (Human Resource Officer)	(045) 967 0021

1.5 Participation Process

Reasonable steps must be taken by the Inkwanca Local Municipality to bring its draft WSDP to the notice of a number of different stakeholders so that they have the opportunity to comment on it as per Section 14 of the Water Services Act. A copy of the WSDP must also be supplied to the minister of Water Affairs and Forestry, Minister of Provincial and Local Government, the relevant Province and neighbouring WSAs.

A Public Participation Process was held for the residents of the Inkwanca Local Municipality, as part of the participation process of the WSDP. The Public Participation Process involved the completion of questionnaires by the different ward committees established in Molteno and Sterkstroom respectively. The Inkwanca Councillors facilitated this process. A full Public Participation Process was not possible due to the time constraints involved. In all, about 97 questionnaire sets were completed for the Inkwanca Local Municipality and are available on request.

For a summarised report on the Public Participation Process in Molteno and Sterkstroom respectively please refer to Annexure A & B.

Other than the Public Participation Process in Molteno and Sterkstroom the following different stakeholders were also notified of the opportunity to comment on the WSDP for the Inkwanca Local Municipality, and they are:

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

1.6 Responsible officials

To ensure that each component of the WSDP is adequately addressed and implemented, the following officials from the WSA were assigned as listed below to take responsibility for the different WSDP components.

Areas of expertise	Responsible official	Tel.	E-mail
1. Project manager	NA Ncube	(045) 967 0021	ncube@moltenosa.gov.za
2. Workshop/participation Facilitator/ co-ordinator	ET Zini	(045) 967 0021	ncube@moltenosa.gov.za
3. Physical profile / GIS / maps	I Hansen	(045) 838 4098	
4. Social profile / community liaison	ET Zini / N Simanga	(045) 966 0008	ncube@moltenosa.gov.za
5. Economic profile / business liaison	J Wentzel	(045) 967 0021	ncube@moltenosa.gov.za
6. Domestic consumer profile			
7. Industry consumers & water quality			
8. Health education & liaison			
9. Water resources, conservation & demand management			
10. Water services infrastructure operation	B van Zyl / B Geyer	(045) 967 0021	ncube@moltenosa.gov.za
11. Water services system management	E T Zini	(045) 966 0008	ncube@moltenosa.gov.za
12. Environmental impact & legal Compliance			
13. Institutional and management	N A Ncube	(045) 967 0021	ncube@moltenosa.gov.za
14. Finance	J Wentzel / NF Koto	(045) 967 0021	ncube@moltenosa.gov.za
15. Strategic planning & analysis co-ordination	N A Ncube	(045) 967 0021	ncube@moltenosa.gov.za
16. Inter-sectoral alignment and integration with IDP	N A Ncube	(045) 967 0021	ncube@moltenosa.gov.za

1.7 Approval by the Inkwanca Local Council

Inkwanca Local Council Resolution			
Resolution Reference No		Date	

2 IDP AND WSDP GOALS

2.1 IDP vision

IDP vision for the municipality
A Municipality that provides an opportunity for material and social upliftment for its residents through economic growth, multi-skilling of communities, good governance, and provision of efficient and quality services.

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 is 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.

2.2 IDP priority issues and objectives related to water services

The IDP process provides for the development of mid-term objectives for each priority issue. The following table indicates the priority issues highlighted in the Inkwanca Local Municipality's IDP and how it relates to water services.

IDP priority issues which impact on water services	IDP objectives related to water services
Water and Sanitation.	Ensure all households within the Inkwanca Municipal area have access to clean potable water
	Implement an appropriate and affordable water and sanitation services policy for various contextual environments in July 2002.
	Implement free basic water in the Inkwanca Municipal area by July 2002
	Ensure all households within the Inkwanca Municipal area have access to affordable and appropriate sanitation service by 2006.
	Contribute to improved hygiene practices
Housing	Ensure that the housing need of the most disadvantaged residents is adequately addressed
	Enable people to access land for housing

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 (Inkwanca Local Municipality) should aim to achieve, namely :

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

2.3 Sustainable water services sub-goals

	Sub-goals
Provision of basic water services (includes free basic water)	To implement free basic water policy in the Inkwanca Municipal area by July 2002
Provision of basic sanitation services	Ensure that the bulk sanitation services infrastructure is adequate enough.
Higher levels of water services	All households within the Inkwanca Municipal area to have house connections.
Higher levels of sanitation services	Ensure that all households within the Inkwanca Municipal area have access to affordable and appropriate sanitation

2.4 Integrated water resource management sub-goals

	Sub-goals
Water resource protection	Develop and implement WSDP.
Water resource conservation	Develop and implement WSDP.
Demand management	Develop and implement WSDP.
Other (state)	None

2.5 Efficient and effective water services institutional arrangements sub-goals

	Sub-goals
Water services authority (WSA) overall capacity	Align tariff policy with Indigent policy.
	Improve consumer payments : Installation of water meters in the Inkwanca Local Municipality
Water services provider (WSP) institutional arrangements	N/A

3. PHYSICAL AND SOCIO-ECONOMIC PROFILE

3.1 MAP – Current situation

The boundary of the WSA (Inkwanca LM) is shown in the attached drawing Map. no.26 of February 2000, as provided by the Municipal Demarcation Board. The N6 national route passes through the east of the Inkwanca LM, while regional routes R 56 and R 344 pass through the respective towns of Molteno and Sterkstroom.

3.1A MAP – Current situation : Molteno

Attached drawing no. 185050QO/03 shows the layout plan for Molteno. Three distinctive areas are shown on the plan namely Molteno town, Nomonde residential area and Dennekruin residential area.

Bulk water to Molteno is supplied from the Molteno dam, Jubilee dam and a borehole in the town. The bulk water is purified at the Molteno WPP located to the south of the town. Purified water within the SABS 241specification gravitates to two storage reservoirs located west of the purification works from where the bulk distribution network commence for the entire Molteno.

The existing water services characteristics as provided by the Inkwanca Local Municipality are shown in attached drawing 185050QO/11.

The Molteno WWTW is located to the east of Molteno. All the wastewater is pumped to the WWTW. The WWTW comprise an-aerobic ponds, facultative ponds, maturation ponds and irrigation ponds consisting of a total area of 28 800m^2.

The existing sanitation services characteristics in Molteno as provided by the Inkwanca Local Municipality are shown in attached drawing 185050QO/13.

The known bulk water and sanitation infrastructure services for Molteno are shown in attached drawing no. 185050QO/5.

3.1B MAP – Current situation : Sterkstroom

Attached drawing no. 185050QO/04 shows the layout plan for Sterkstroom. Three distinctive areas are shown on the plan namely Sterkstroom town, Masakhe residential area and Hoffmansville residential area.

Four existing water sources, namely, the Halse Fountains, three boreholes in Sterkstroom, two Masakhe boreholes and the Lismore borehole supply or can supply water to the Sterkstroom and Masakhe reservoirs at present. There are five other boreholes that are not in use (Refer to the attached Site Locality Map by GeoCon dated 24 April 2002).

Two Halse fountains exist on the farm Carnarvon Estates, 17 km east of the town. This is a water source that was developed by the South African Railways in 1903 to supply water for domestic purposes as well as for the steam locomotives. The present delivery from this source is 6 l/s. Water is gravitated by means of a 23 km x 125 mm ø CI gravity main to a 455 kl break pressure tank at Penhoek, then a 240 kl and a 480 kl break pressure tank at Hex River and finally to the 1 100 kl Sterkstroom reservoir. The total present delivery from the fountains is 6 l/s (518 kl/d). It is alleged that the maximum delivery of the fountains is 12 l/s but this figure needs to be verified.

Six boreholes (Sterkstroom 1 to 6) were drilled 1 km north of the town to supply water to the communities. Two of these boreholes were vandalized to destruction and need to be cement plugged. The pumping equipment of two other boreholes was vandalized d need to be replaced. The safe yields of the Sterkstroom borehole 2,4 & 6 are given in the successive chapters. These safe yields were obtained during the geohydrological survey done by the SA Geoconsultans.

The existing water services characteristics in Sterkstroom as provided by Inkwanca Local Municipality are shown in attached drawing 185050QO/12.

Sterkstroom town and Hoffmansville have a full waterborne sanitation system. 351 erven in Old Masakhe have access to full waterborne sanitation while the remainder of Old Masakhe is currently served by the bucket sanitation system. This is an unacceptable system that is below RDP standards and it is foreseen that the remainder of Old Masakhe will be provided with waterborne sanitation within the next five years, thus increasing the water demand.

Sterkstroom town consist of a small bore sewerage system which are a network of pipes with diameters between 63 mm and 160 mm which are connected to conservancy tanks on every erf. Only the supernatant of every tank is carried away to the WWTW, the solids stays in the tank and digest.

Hofmansville consists of a conventional sewerage network that carries away the entire effluent. The sewerage gravitates from Hoffmansville, through old Masakhe to a sewerage pump station south of Masakhe. The sewerage is then pumped to the WWTW.

The entire Masakhe consist of a simplified sewerage network, but only 30% of the erven have flush toilets and are connected to the sewerage network. It is planned that the entire Masakhe will be provided with flush toilets and connected to the sewerage network.

3.2 MAP – Future situation

The Inkwanca Local Municipality is aiming at the following development strategies and objectives:

- To devise and implement an appropriate and affordable water and sanitation services policy for various contextual environments by July 2002.
- To ensure that all households within the Inkwanca Local Municipal area have access to clean potable water.
- To ensure that all households within the Inkwanca Local Municipal area have access to affordable and appropriate sanitation service by 2006.
- To implement free basic water policy in the Inkwanca Local Municipal area by July 2002.
- To ensure that the housing need of the most disadvantaged residents is adequately addressed.
- To enable people to access land for housing.

3.2A MAP – Future situation : Molteno

The future water services characteristics in relation to the existing water services characteristics are shown on attached drawing 185050QO/13. The provision of yard connections to all households currently served by communal water supply and the installation of water meters to all households with un-metered water on site connections are the two water connector services priority projects for Molteno.

A housing development of 2000 erven is also planned at the old airstrip of Molteno. In view of this development the existing WPP of Molteno will be upgraded to meet the new demand of the housing development and those areas receiving improved level of services in terms of water and sanitation.

Households indicated on attached drawing 185050Q0/11 as having none or inadequate services with regard to sanitation will be upgraded to waterborne sewers.

3.2B MAP – Future situation : Sterkstroom

The future water services characteristics in relation to the existing water services characteristics are shown on attached drawing 185050QO/12. The provision of yard connections to all households currently served by communal water supply and the installation of water meters to all un-metered households are the two connector services priority projects for Sterkstroom.

A housing development of 2 021 erven at Sterkstroom and Masakhe is also planned for the informal households in Sterkstroom.

Households indicated on attached drawing 185050Q0/14 as having none or inadequate (bucket sanitation system) services with regard to sanitation will be upgraded to waterborne sewers.

3.3 Physical profile

The following tables are the descriptive summaries of the different attributes that form the physical profiles of Molteno and Sterkstroom, respectively,

3.3A Physical profile : Molteno

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	3671	N.A.	N.A.	N.A.	Y	Y	N
2. Commercial areas	31	N.A.	N.A.	N.A.	Y	Y	N
3. Police Stations	1	N.A.	N.A.	N.A.	Y	Y	N
4. Magisterial Offices	1	N.A.	N.A.	N.A.	Y	Y	N
5. Schools	5	N.A.	N.A.	N.A.	Y	Y	N
6. Clinics	3	N.A.	N.A.	N.A.	Y	Y	N
7. Hospitals	1	N.A.	N.A.	N.A.	Y	Y	N
8. Prisons							
9. Industries	4	N.A.	N.A.	N.A.	Y	Y	N
10. Mining							
11. Agriculture dryland	3	N.A.	N.A.	N.A.		Y	N
12. Agriculture irrigation							
13. Agr. Intensive livestock							
14. Agr. Extensive livestock	3	N.A.	N.A.	N.A.		Y	N
15. Resorts and tourism	1	N.A.	N.A.	N.A.		Y	N
16. Conservation areas						Y	N
17. Other (Please state) Old-age Home	1	N.A.	N.A.	N.A.		Y	N
18. Other (Please state)	N/A						

3.3B Physical profile : Sterkstroom

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	2146	N.A.	N.A.	N.A.	Y	Y	N
2. Commercial areas	16	N.A.	N.A.	N.A.	N	Y	N
3. Police Stations	1	N.A.	N.A.	N.A.	N	Y	N
4. Magisterial Offices	1	N.A.	N.A.	N.A.	N	Y	N
5. Schools	4	N.A.	N.A.	N.A.	N	Y	N
6. Clinics	2	N.A.	N.A.	N.A.	N	Y	N
7. Hospitals							
8. Prisons							
9. Industries							
10. Mining							
11. Agriculture dryland							
12. Agriculture irrigation							
13. Agr. Intensive livestock							
14. Agr. Extensive livestock							
15. Resorts and tourism	1	N.A.	N.A.	N.A.	N	Y	N
16. Conservation areas	4	N.A.	N.A.	N.A.	N	Y	N
17. Other (Please state) Chreche	3	N.A.	N.A.	N.A.	N	Y	N
18. Other (Please state)							

3.4 Topographical profile

Molteno and Sterkstroom are Karoo towns and the topographical profile can be classified as being flat. Inkwanca Local Municipality is located on watershed line of the Karoo escarpment. The remainder of the areas surrounding Molteno and Sterkstroom can be classified from flat to rolling to mountainous.

3.5 Current consumer profile

The entire municipal area of Molteno and Sterkstroom is classified as being urban while the surrounding areas of both towns comprise of agricultural farmland. The following tables summarise the different consumer profiles for Molteno and Sterkstroom respectively:

3.5A Current consumer profile : Molteno

	Urban	Dense	Village	Scattered	Farmland	Total
1. Total population	20 728				1349	22 077
2. No. of household consumer units	3671				N.A.	3 671
3. No. of dry industrial consumer units	4				N/A.	4
4. No. of wet industrial consumer units						
5. No. of commercial consumer units	31				N/A	31
6. No. other	24				N/A	24

3.5B Current consumer profile : Sterkstroom

	Urban	Dense	Village	Scattered	Farmland	Total
1. Total population	10551				2069	12620
2. No. of household consumer units	2146				N.A.	2146
3. No. of dry industrial consumer units						
4. No. of wet industrial consumer units						
5. No. of commercial consumer units						
6. No. other						

Source of information : Adopted IDP Inkwanca Local Municipality (April 2002).

3.6 Present population and projected population growth rates

The population growth rate per annum used in the IDP is 4%, which is high for the LM taking into account the demographics of the Inkwanca LM. The effective growth rate will be the weighed average taking into account the factors of the HIV/Aids pandemic and the annual growth rate. A current weighed effective growth rate of 1% was calculated taking the previous mentioned factors into account. The effective growth rate will increase marginally in line with mission statement as contained in the IDP to reduce unemployment in the Inkwanca LM.

The effective growth rate for the next five years will thus be as follows:

3.6A Present population and projected population growth rates : Molteno

Settlement Type	No. of households	Current population	Effective population growth rate (%/a)				
			Year 1	Year 2	Year 3	Year 4	Year 5
Urban	3 671	20 728	1%	1%	1.02%	1.05%	1.1%
Dense							
Village							
Farmland	N.A.	1349					
Scattered							
Total							

3.6B Present population and projected population growth rates : Sterkstroom

Settlement Type	No. of households	Current population	Effective population growth rate (%/a)				
			Year 1	Year 2	Year 3	Year 4	Year 5
Urban	2 146	10 551	1%	1%	1.02%	1.05%	1.1%
Dense							
Village							
Farmland	N.A.	2 069					
Scattered							
Total							

3.7 Demographic trends and migration patterns

No information regarding demographic trends and migration patterns is available.

3.8 Age and gender profile

The age and gender profile for the communities of Molteno and Sterkstroom as contained in the Inkwanca LM IDP are shown in the tables below:

3.8A Age and gender profile: Molteno

Settlement Type	Permanent resident population	Aged Residents (>65yrs)	Youth residents (<18yrs)	Male residents	Female residents
Urban	20 728	2 648	6 604	9 742	10 986
Dense					
Village					
Farmland	1 349	162	419	634	715
Scattered					
TOTAL	22 077	2 810	7 023	10 376	11 701

3.8B Age and gender profile: Sterkstroom

Settlement Type	Permanent resident population	Aged Residents (>65yrs)	Youth residents (<18yrs)	Male residents	Female residents
Urban	10 551	390	2 004	4 979	5 572
Dense					
Village					
Farmland	2 069	24	127	977	1 092
Scattered					
TOTAL	12 620	414	2 131	5 956	6 664

3.9 Health profile

No information regarding the overall health indicators is available for the Inkwanca LM. The quality of water is being controlled, and monitored once a month and sometimes on a weekly basis according to officials from the Inkwanca LM.

3.10 Employment profile

The statistics from IDP demonstrate that 80.5% of the residents of Inkwanca either do not have income or earn below R12 000-00 per annum. The high rate of unemployment impacts on the citizens' ability to pay for services. The employment profile for Molteno and Sterkstroom as contained in the Inkwanca LM IDP are shown in the following tables:

3.10A Employment profile: Molteno

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	11 476	9 238	N.A.	N.A.	N.A.	N.A.	N.A.
2. Dense							
3. Village							
4. Farmland	1 349	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
5. Scattered							
6. TOTAL							

3.10B Employment profile: Sterkstroom

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
7. Urban	5 841	4 702	N.A.	N.A.	N.A.	N.A.	N.A.
8. Dense							
9. Village							
10. Farmland	2 019	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
11. Scattered							
12. TOTAL							

3.11 Household income

The household income for Molteno and Sterkstroom as contained in IDP in relation to affordability of water and sanitation services are as follows:

3.11A Household income : Molteno

Settlement type	Number of households with monthly income of:					Affordability			
						Water		Sanitation	
	< R800	R800 to R1500	R1500 To R2500	R2500 To R3500	> R3500	Typical Monthly Water Bill	Avg % of monthly income	Typical monthly Water Bill	Avg % of monthly income
1. Urban	540	2461	233	235	261	R26-40	4.02%	R21-22	3.2%
2. Dense									
3. Village									
4. Farmland									
5. Scattered									
6. TOTAL									

3.11B Household income : Sterkstroom

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 Water Bill	Avg. % of monthly income	Typical monthly Water Bill	Avg. % of monthly income
7. Urban	311	1417	160	108	150	R 25.85	3.2%	R 46.45	5.8%
8. Dense									
9. Village									
10. Farmland									
11. Scattered									
12. TOTAL									

3.12 Poor household definition

Definition of poor household by the Inkwanca Local Municipality:
People earning less than R 800/month

3.13 Economic sectors, GGP contribution and employment

Stock farming and manufacturing are the major economic sectors that contribute to the LM economy. Agro development constitutes the largest portion of economic activity with the largest number of employees working on farms around Molteno and Sterkstroom. The manufacturing is dominated by Nola ("Ouma rusk" manufacturing), the Bone Mill factory (manufacturing cattle feed); and the Stormberg Organic Farms manufacturing biltong. All of these previous mentioned institutions are located around Molteno.

The following table describes the sector contributions to the gross geographic product (GGP) in the Inkwanca LM.

Economic sector	Total no. of employees	No. of local employees	No. of migrating labour	% contribution to local GGP
Stock farming	N.A.	N.A.	N.A.	N.A.
Manufacturing	N.A.	N.A.	N.A.	N.A
Agricultural farming	N.A.	N.A.	N.A.	N.A.

3.14 Economic trends

No information regarding the economic trends is available for the Inkwanca LM.

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.

This part of the planning process is driven by the vision and mission of the IDP. The targets set in this section are compatible with the IDP.

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 is a range 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 –

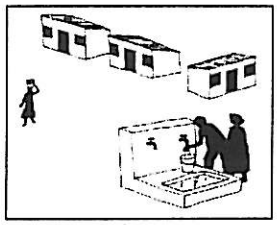
- at a minimum flow rate of not less than 10 litres per minute;
- within 200 metres of a household; and
- with an effectiveness of not more than 7 days interruption supply to any consumer per year.

Basic sanitation comprises:

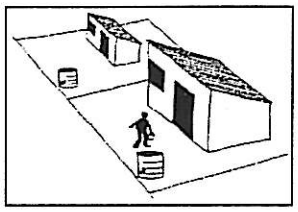
a) the provision of appropriate health and hygiene education; and

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.

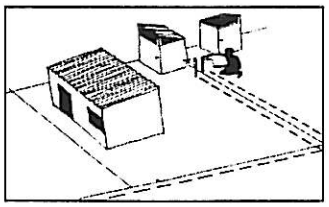
Water service levels
Communal water supply
See 'basic water supply' explained above.

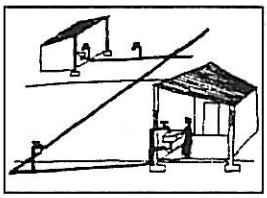


Controlled volume supply
E.g. Yard Tanks
Each house is provided with a tank which holds about 200 litres. The tank gets filled up once a day. This type of service is often referred to as an intermediate level of supply.

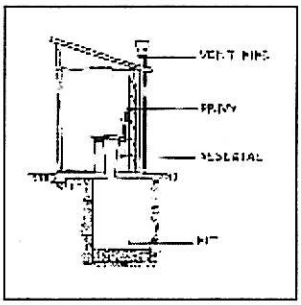


Uncontrolled volume supply
There are generally two types: either the tap stands outside the house on its own or on the wall of an outside toilet (yard tap) or water is piped into the house to take water to taps in the kitchen, bathroom, toilet etc.

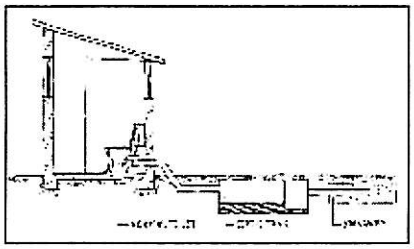




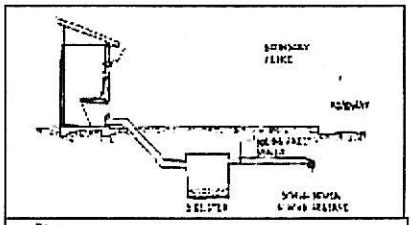
Sanitation
Consumer installations: Dry
See basic sanitation supply explained above. The latrine has a lined pit with a concrete slab over it. An air vent allows smells out into the air above the privy.



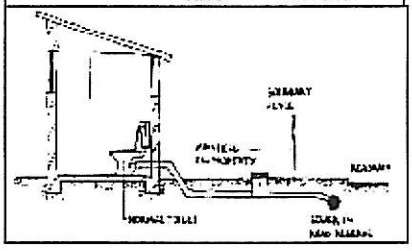
Consumer installations: Wet (septic tanks)
Water is flushed into a digester where certain bacteria live. Digester effluent flows into the soakaway, then the ground. The digester has to be pumped out occasionally.



Discharge to wastewater treatment works
Here there are generally two types: intermediate (e.g. aquaprivy with solids free sewer which is similar to a septic tank, but instead of a soakaway 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.

Service level coverage – "quantity"

The current situation was completed for the urban settlement type is and consolidated according to the tables below. By year 5, there shall be no consumer units that have a level of supply that is "none or inadequate".

4.1 Residential consumer units for water: urban

All residential and non-residential erven in Molteno and Sterkstroom are considered to be in urban context. All subheading relating to rural village and rural scattered erven, as prescribed in the Guidelines for WSDP, are none existent in the Inkwanca LM and will thus be ignored since it is of no significance. The rural farmland context is reported in chapter 3 in terms population figures but no other information is available and subsequently all subhedings on rural farmland is ignored in the successive chapters.

4.1A Residential consumer units for water: urban : Molteno

No. consumer units with:	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. None or inadequate		0	0	0	0	0	0
2. Communal water supply		681	0	0	0	0	0
3. Controlled volume supply		0	0	0	0	0	0
4. Uncontrolled volume supply: yard tap or house connection		2 990	3 708	5 745	5 745	5 745	5 745
5. Total served (2+3+4)		3 671	3 708	5 745	5 745	5 745	5 745
6. Total (1 + 5)		3 671	3 708	5 745	5 745	5 745	5 745

All consumers in Molteno have access to at least a basic level of water supply currently. The communal water supply to 681 households is a priority project of the Inkwanca LM in which these households will receive water on site connections as reflected in the table above. In year 2 the households in Molteno increase by 2000 households due to the planned airstrip housing development of the LM. The effective growth in residential erven remains the same for the proceeding 3 years after 2000 household airstrip development, thus the effective growth rate is compensated by the planned development. It is foreseen that all households in year 5 will have access to water on site.

4.1B Residential consumer units for water: urban : Sterkstroom

No. consumer units with:	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. None or inadequate		0	0	0	0	0	0
2. Communal water supply		100	100	0	0	0	0
3. Controlled volume supply		0	0	0	0	0	0
4. Uncontrolled volume supply: yard tap or house connection		2046	2067	2188	2209	2231	2253
5. Total served (2+3+4)		2146	2167	2188	2209	2231	2253
6. Total (1 + 5)		2146	2167	2188	2209	2231	2253

All consumers in Sterkstroom have access to at least a basic level of water supply currently. The communal water supply to 100 households in Masakhe is a priority project of the LM, these 100 households will receive water on site connections as reflected in the table above. The effective growth rate for Sterkstroom compensates for the constant growth in households as shown in the above table. It is foreseen that all households in year 5 will have access to water on site

4.3 Residential consumer units for water : rural : village

This section is not applicable.

4.4 Residential consumer units for water : rural : scattered

This section is not applicable.

4.5 Residential consumer units for water : rural : farmland

This section is not applicable.

4.6A Residential consumer units for sanitation: urban : Molteno

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		0	0	0	0	0	0
2. None or inadequate: Below RDP: Bucket		219	119	69	0	0	0
3. Consumer installations: On site dry or equivalent		0	0	0	0	0	0
4. Consumer installations: Wet (septic tanks, digester or tanker desludge etc.)		51	51	0	0	0	0
5. Discharge to water treatment works (intermediate or full waterborne)		3401	3538	5676	5745	5745	5745
6. Total served (2+3+4+5)		3671	3708	5745	5745	5745	5745
7. Total (1+6)		3671	3708	5745	5745	5745	5745

All consumers in Molteno have access to at least a basic level of service currently. A priority project of the LM will see that 270 erven over the two years receive waterborne sewage connections. In year 2 the households in Molteno increase by 2000 households due to the planned airstrip housing development of the LM. It is foreseen that all households in year 5 will have waterborne sewer connections.

4.6B Residential consumer units for sanitation : urban : Sterkstroom

No. consumer units with access to sanitation facilities:	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
None or inadequate: Below RDP: Pit		721	345	0	0	0	0
None or inadequate: Below RDP: Bucket		726	726	566	397	198	0
Consumer installations: On site dry or equivalent		0	0	0	0	0	0
Consumer installations: Wet (septic tanks, digester or tanker desludge etc.)		200	200	200	200	200	200
Discharge to water treatment works (intermediate or full waterborne)		499	896	1422	1612	1833	2053
Total served (2+3+4+5)		1425	1822	2188	2209	2231	2253
Total (1+6)		2146	2167	2188	2209	2231	2253

All consumers in Molteno have access to at least a basic level of service currently. Two priority projects of the LM will see that 721 households and 726 households are upgraded to waterborne sewers from pit latrines and bucket system respectively. The upgrading of 726 households will span over 4 year period while the 721 households is part of a housing project over the next 2 years. It is foreseen that all households in year 5 will have waterborne sewer connections.

4.7 Residential consumer units for sanitation : rural : dense

This section is not applicable.

4.8 Residential consumer units for sanitation : rural : village

This section is not applicable.

4.9 Residential consumer units for sanitation : rural : scattered

This section is not applicable.

4.10 Residential consumer units for sanitation : rural : farmland

This section is not applicable.

4.11 Public institutions and 'dry' industries: urban

The existing situation and targets for industrial consumers is only addressed according to urban. Public institutions and 'dry' industries have similar consumer types to residential consumer units and are assessed in a similar way.

4.11A Public institutions and 'dry' industries: urban : Molteno

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				1
	Current	1				1
	5 years	1				1
Magistrate offices	Prior 1	1				1
	Current	1				1
	5 years	1				1
Businesses	Prior 1					
	Current	28				28
	5 years	28				28
"Dry" industries	Prior 1	4				4
	Current	4				4
	5 years	4				4
Office buildings	Prior 1	8				8
	Current	8				8
	5 years	8				8
Garages	Prior 1	4				4
	Current	4				4
	5 years	4				4
Prisons	Prior 1					
	Current					
	5 years					
Schools	Prior 1	5				5
	Current	5				5
	5 years	6				6
Hospitals	Prior 1	1				1
	Current	1				1
	5 years	1				1
Clinics	Prior 1	2				2
	Current	3				3
	5 years	3				3
Crèches	Prior 1	3				3
	Current	3				3
	5 years	4				4
Other (Specify)	Prior 1	1				1
	Current	1				1
	5 years	1				1
Total	Prior 1					
	Current	59				59
	5 years	61				61

4.11B Public institutions and 'dry' industries: urban: Sterkstroom

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				1
	Current	1				1
	5 years	1				1
Magistrate offices	Prior 1	1				1
	Current	1				1
	5 years	1				1
Businesses	Prior 1					
	Current	12				12
	5 years	12				12
"Dry" industries	Prior 1					
	Current					
	5 years					
Office buildings	Prior 1	3				3
	Current	3				3
	5 years	3				3
Garages	Prior 1	2				2
	Current	1				1
	5 years	1				1
Prisons	Prior 1					
	Current					
	5 years					
Schools	Prior 1	4				4
	Current	4				4
	5 years	5				5
Hospitals	Prior 1					
	Current					
	5 years					
Clinics	Prior 1	3				3
	Current	2				2
	5 years	2				2
Crèches	Prior 1	2				2
	Current	3				3
	5 years	4				4
Other (Specify)	Prior 1	1				1
	Current	1				1
	5 years	1				1
Total	Prior 1					
	Current	28				28
	5 years	29				29

All public institutions and 'dry' industries currently and in 5 years time will have access to uncontrolled volume water supply. It is foreseen that the totals as highlighted in both previous tables for public institutions and dry industries will remain the same but can

also reduce depending on the economic activity of the region especially for all the dry industries (businesses, office buildings, garages etc.).

4.13 Wet Industries: urban and rural

There are no wet industries in the entire Inkwanca LM.

4.14 'Raw' water consumers: urban and rural

There are no consumers who receive raw water from Inkwanca LM.

4.15 Industrial consumer units for sanitation: urban

The following table summarises the available data relating to industrial consumer units for sanitation in Molteno only, as there are no industrial consumer units in Sterkstroom:

4.15A Industrial consumer units for sanitation: urban : Molteno

Industry	Time frame	Number of service units	Monthly waste water (kl)	Monthly sewage (kl)	Washing, leaches through storm water system (kl)	Total treated effluent (kl)	Total untreated effluent (kl)	Total return flow to river system (kl)
Dry	Prior 1	4	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	Current	4	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	5 years							
Total	Prior 1							
	Current							
	5 years							

4.16 Industries and their permitted effluent releases

Industrial effluent, which is directly returned to source, must be permitted. Of the four dry industries in the Inkwanca LM only the bone mill factory discharge effluent directly to a source and it should be noted that the discharge occur after the abstraction point for the bulk water for Molteno and is done on a infrequent basis. DWAF Free State monitors the effluent discharged by the bone mill factory on a monthly basis and should have records pertaining to the effluent released.

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 is compared to permitted abstraction and return rights as stipulated in the permits.

Water Source

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

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. The different water sources for both Molteno and Sterkstroom are listed below:

- abstraction from surface sources within the WSA area of jurisdiction (Molteno dam and Jubilee dam);
- abstraction from groundwater sources within the WSA area of jurisdiction (Sterkstroom boreholes)
- Purchase form external sources (Halse Fountains and A Myburgh)

5.1 Surface water sources

This section shows the requirements per year and whether or not these requirements can be met by permitted abstractions or whether there are additional requirements for which new or amended licenses are required. 'Use' indicates the primary use of the water obtained from the surface source, which in this case is municipal use.

It should be reported that no surface water sources exist in Sterkstroom. The following table summarises the surface water sources in Molteno:

Name	Source Type	Permitted abstraction (Ml/year)	Prior	Current	Yr1	Yr2	Yr3	Yr4	Yr5	Additional requirements at year 5	Use
Molteno	Dam	1460		1240	1252	1408	1425	1442	1459	0	Municipal
Jubilee	Dam	300				300	300	300	300	0	Municipal

Molteno dam is a 3 million m³ earth dam, which provides a guaranteed supply of 1,460 million m³, which is the permitted abstraction per annum, or 4000 m³/day based on the drought cycle of 20 years. Molteno can also draw water from the Jubilee dam but currently can not draw raw water from the Jubilee dam to the WPP as the existing rising main pumps and pump station building is disrepair. The capacity of this dam is approximately 318 226m³ with a safe permitted abstraction taken at 300Ml per annum.

A priority project of the Inkwanca LM is the upgrading of the Molteno WPP and subsequent upgrading of the rising main to the Molteno WPP from the Jubilee dam within the next year. In year 2 the consumption of 300 Ml from Jubilee dam is added and was done to compensate for the planned 2000 airstrip housing development. It is evident that Molteno will not experience any problems in terms of additional requirements versus permitted abstraction from the water sources.

5.2 Groundwater sources – aquifer characteristics

This section assesses all the boreholes that are being used for bulk abstraction and/or groundwater monitoring for human consumption.

5.2A Groundwater sources – aquifer characteristics : Molteno

Molteno can also draw water from two boreholes located in Molteno town. One of the two boreholes are operative and can according to officials from the LM yield approximately 2l/s, the other borehole is inoperative. The LM uses the operative borehole to supplement the bulk water supply from Molteno dam when necessary. The water from operative borehole is reported to be of acceptable quality in terms of human consumption and when used are treated at the WPP. Monitoring of the operative borehole (when used) takes place but not in a formal recording format and thus no formal records or any other information exist. No recorded data is available to complete table 5.2A.

5.2B Groundwater sources – aquifer characteristics : Sterkstroom

Four existing water sources, namely, the Halse Fountains, three boreholes in Sterkstroom, two Masakhe boreholes and the Lismore borehole supply or can supply water to the Sterkstroom at present.

Two Halse fountains exist on the farm Carnarvon Estates, 17 km east of the town. This is a water source that was developed by the South African Railways in 1903 to supply water for domestic purposes as well as for steam locomotives. The total present delivery from the fountains is 6 l/s (518 kl/d). It is alleged that the maximum delivery of the fountains is 12 l/s but this figure needs to be verified.

Six boreholes (Sterkstroom 1 to 6) were drilled 1 km north of the town to supply water to the communities. Two of these boreholes were vandalized to destruction and need to be cement plugged. The pumping equipment of two other boreholes was vandalized and need to be replaced.

The available groundwater aquifer characteristics for Sterkstroom are the following:

Borehole/ well number	Aquifer type (hard rock, sand or boulders)	Permitted abstraction (Ml/year)	Prior	Current	Yr1	Yr2	Yr3	Yr4	Yr5	Additional require-ments at year 5	Use
EC/001/CH	N.A.	Not in use									
EC/002/CH	N.A.	29.4		29.4	29.4	29.4	29.4	29.4	29.4		LM
EC/003/CH	N.A.	Not in use									
EC/004/CH	N.A.	36.7		36.7	36.7	36.7	36.7	36.7	36.7		LM
EC/005/CH	N.A.	Not in use									
EC/006/CH	N.A.	7.9		7.9	7.9	7.9	7.9	7.9	7.9		LM
EC/015/CH	N.A.	Not in use									
EC/008/CH	N.A.	5.25		5.25	5.25	5.25	5.25	5.25	5.25		LM
EC/009/CH	N.A.	2.75		2.75	2.75	2.75	2.75	2.75	2.75		LM

5.3 Groundwater monitoring: Molteno and Sterkstroom

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

Groundwater monitoring does not take place in a formal format and therefore the LM can if funds allow implement a formal reporting format and involve a qualified hydrogeologist on regular basis. Reporting on the groundlevels for the groundwater sources in Sterkstroom and involving a qualified hydrogeologist on regular basis will definitely assist the LM in managing the water supply to Sterkstroom.

5.4 External sources

The Inkwanca LM does not purchase bulk water from any other external source with regard to Molteno, however bulk water is purchased from 2 private sources in regard to Sterkstroom.

5.4B External sources : Sterkstroom

Name	Contracted supply volume (Ml/year)	Prior 1	Current	Yr1	Yr2	Yr3	Yr4	Yr5	Additional requirements at year 5
Halse Fountains	189		189	189	189	189	189	189	None
Albert Myburgh	148		148						
TOTAL									

5.5 Water returned to resources

No water is returned to resources in Molteno and Sterkstroom and therefore this section is not applicable.

5.6 Quality of water taken from source: urban : Molteno and Sterkstroom

	At source	At reservoir	At tap
Is water quality measured? (yes/no)	No	Yes	Yes
Do you monitor it yourself? (yes/no)	No	No	No
If no, who does?		DWAF	DWAF
Monitoring intervals (daily, weekly, monthly, quarterly, bi-annually, annually)		Quarterly	Quarterly
Are these results available in electronic format? (yes/no)		No	No
% time (days) within SABS 241 standards per year		90%	90%

5.7 Quality of water taken from source: rural

This section is not applicable.

5.8 Reporting on quality of water taken from source: Molteno and Sterkstroom

	Yes/ No	Method of notification
If quality of water taken from source does not comply, are urban residents notified?	Yes	Oral announcements in the respective towns.
If quality of water taken from source does not comply, are rural residents notified?	N/A	N/A

5.9 Quality of water returned to the resource: urban

This section is not applicable as no water is returned to resource in both Molteno and Sterkstroom.

5.10 Quality of water returned to the resource: rural

This section is not applicable.

5.11 Pollution contingency measures

This section is not applicable as no water is returned to resource in Molteno and Sterkstroom.

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 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.

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)

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 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 volume 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.

6.1 Targets for reducing unaccounted for water and water inefficiencies (Ml/year): urban

The Inkwanca LM does not have any targets for reducing unaccounted water and water inefficiencies as the greater part of Molteno and Sterkstroom does not have any water meters. A priority project of the Inkwanca LM is the installation of 2300 water meters in Molteno and 1740 water meters in Sterkstroom to un-metered water on site connections. The water meters will be installed over the next four years.

Once these water meters are installed the Inkwanca LM will be in a position to monitor consumption in the respective water distributions network of Molteno and Sterkstroom. Bulk water meters to most of the reticulation networks are also missing therefore increasing the unknown factor of the water consumed versus water losses.

Targets for reducing unaccounted water and water inefficiencies can be set once the LM have the necessary data pertaining to this issue. The same reasoning is also applicable for reducing high pressures for residential consumers, public information and education programmes, leak and meter repair programmes and working for water programme. It should be report that the Inkwanca LM is moving in the right direction

regarding water conservation with the installation of water meters to the un-metered connections.

6.2 Targets for reducing unaccounted for water and water inefficiencies (Ml/year): rural

This section is not applicable.

6.3 Reducing high pressures for residential consumers: urban

Refer paragraph 6.1.

6.4 Reducing high pressures for residential consumers: rural

This section is not applicable.

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

Refer paragraph 6.1.

6.6 Leak and meter repair programmes: urban

Refer paragraph 6.1.

6.7 Leak and meter repair programmes: rural

This section is not applicable.

6.8 Working for Water Programme

Refer paragraph 6.1.

7. WATER SERVICES INFRASTRUCTURE PROFILE

With service level targets set, associated flows identified within the context of the resource constraint and possibilities for reducing demand investigated, the WSA is in a position to assess whether its existing infrastructure is sufficient to meet future demand. This section covers:

- existing infrastructure;
- schemes to be transferred;
- schemes to be rehabilitated; and
- new infrastructure to be built.

7.1 Existing infrastructure

For the existing water services infrastructure in both Molteno and Sterkstroom, please refer to Annexures C and D respectively where a detailed report relating to aspects listed below is given.

The assessment focussed on the following aspects and only information supplied by the Inkwanca LM was used:

- ownership (to inform the transfer process from national government to local authorities)
- asset description & value (for auditing purposes & to inform the transfer process)
- component type (e.g. building material or process type)
- supply capacity (both the used and available capacity)
- present operational status (to inform management, training and capacity programs)
- present condition and functionality (to establish the refurbishment or replacement needs)

7.2A Brief functional description of existing main infrastructure components : Molteno

Component	Description of the main functional tasks	Responsibility
WTP	Purifies all bulk water abstracted	Inkwanca LM
WWTW	Treat the sewer and waste water effluent	Inkwanca LM
Molteno water reticulation network	Distributes the purified bulk water in Molteno from reservoirs located close to the WTP	Inkwanca LM
Molteno sanitation network	Collects all sewage and waste water for treatment at WWTW	Inkwanca LM

7.2B Brief functional description of existing main infrastructure components : Sterkstroom

Component	Description of the main functional tasks	Responsibility
Boreholes & pump stations	Provides Sterkstroom will bulk water for human consumption	Inkwanca LM
WWTW	Treat the sewer and waste water effluent	Inkwanca LM
Sterkstroom water reticulation network	Distributes the pumped water of the boreholes in Sterkstroom from reservoirs located close at strategic positions	Inkwanca LM
Sterkstroom sanitation network	Collects all sewage and waste water for treatment at WWTW	Inkwanca LM

7.3 Existing groundwater infrastructure

Please refer annexure C and D respectively for data relating to existing groundwater infrastructure in Molteno and Sterkstroom.

7.4 Existing surface water infrastructure

Please refer annexure C and D respectively for data relating to existing groundwater infrastructure in Molteno and Sterkstroom.

7.5 Existing water treatment works infrastructure

Please refer annexure C and D respectively for data relating to existing water treatment works infrastructure in Molteno and Sterkstroom.

7.6 Existing pump stations infrastructure

Please refer annexure C and D respectively for data relating to existing pump stations infrastructure in Molteno and Sterkstroom.

7.7 Existing bulk pipeline infrastructure

Please refer annexure C and D respectively for data relating to existing bulk pipeline infrastructure in Molteno and Sterkstroom.

7.8 Existing reservoir infrastructure

Please refer annexure C and D respectively for data relating to existing reservoir infrastructure in Molteno and Sterkstroom.

7.9 Existing reticulation infrastructure (by supply zone)

Please refer annexure C and D respectively for data relating to existing groundwater infrastructure in Molteno and Sterkstroom.

7.10 Schemes to be transferred: water

There are no schemes in terms of water to be transferred to Inkwanca LM.

7.11 Schemes to be transferred: sanitation

There are no schemes in terms of sanitation to be transferred to Inkwanca LM.

7.12 Schemes to be rehabilitated

Assessing the existing infrastructure in Molteno and Sterkstroom versus the future service levels necessitated that the following schemes be upgraded according to the IDP :

Scheme Name	Component name	Refurbishment needs	Feasibility checked (Y/N)	Scheduled Date	Estimated cost
Water Treatment Works	Molteno		Unknown	2003	R 1 100 000
Groundwater	Carnavon Estates (Sterkstroom)	Pipeline and pumping equipment upgrade	Unknown	2003	R 2 380 000

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 was assessed.

No infrastructure was found to be inadequate according the IDP. However the WSDP assessment found some bulk infrastructure to be inadequate should the housing developments continue in Molteno and Sterkstroom.

7.14 Future internal and connector infrastructure

The following table summarises the future internal and connector water and sanitation infrastructure arrangements in relation to future service level targets as identified in the IDP.

Type of scheme	Component	Short description	Feasibility checked (Y/N)	Scheduled Date	Estimated cost
Water reticulation	Nomonde (Molteno)	681 sites to receive water on site connections	Unknown	2002/03	R 1 700 000
Water reticulation	Masakhe (Sterkstroom)	100 sites to receive water on site connections	Unknown	2002/04	R 250 000
Water reticulation	Molteno	2300 water meters for un-metered sites	Unknown	2002/06	R 2 300 000
Water reticulation	Sterkstroom	1740 water meters for un-metered sites	Unknown	2002/06	R 1 740 000
Sewer reticulation	Nomonde (Molteno)	270 sites to receive waterborne sewers	Unknown	2002/05	R 540 000
Sewer reticulation	Masakhe (Sterkstroom)	726 sites to receive waterborne sewers	Unknown	2002/06	R 1 452 000

7.15 Future bulk water supply infrastructure

No future bulk water supply infrastructure was listed in the IDP of the Inkwanca LM.

7.16 Future bulk sanitation infrastructure

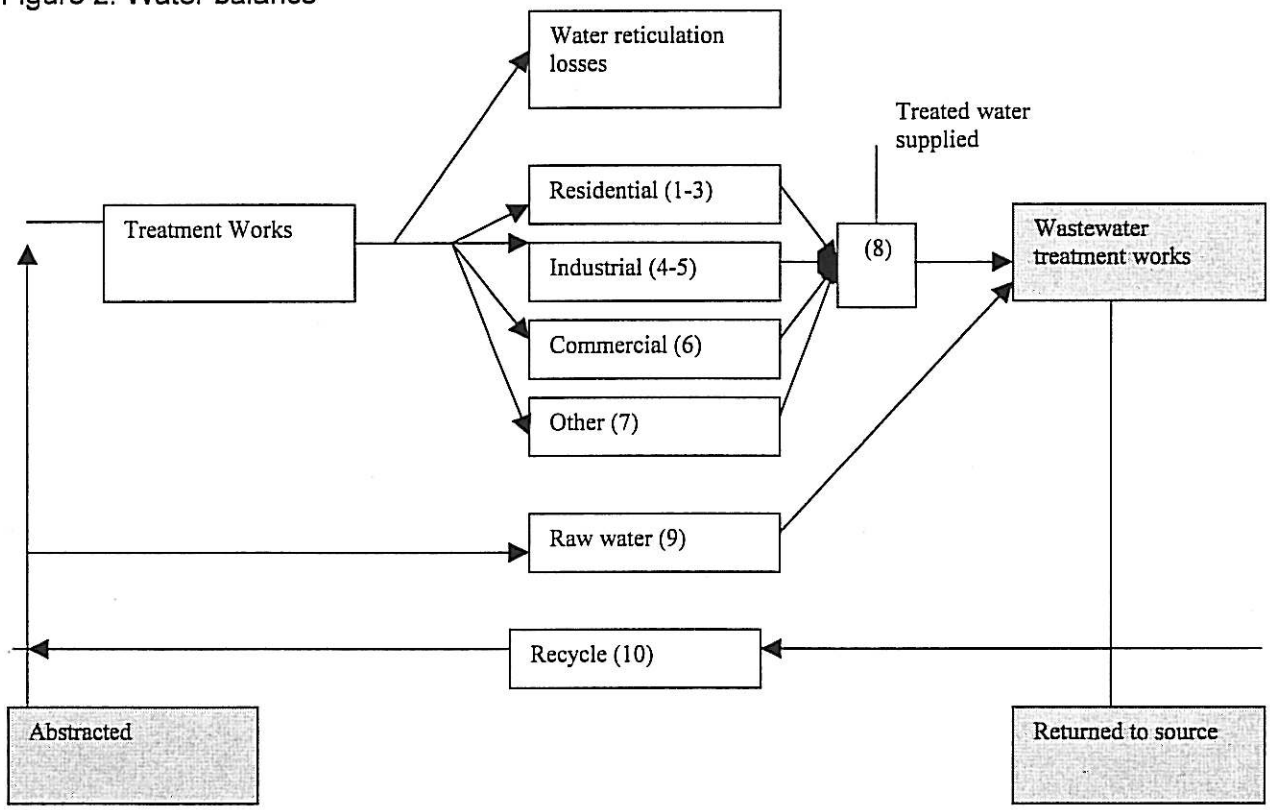
No future bulk sanitation infrastructure was listed in the IDP of the Inkwanca LM.

8 WATER BALANCE

The water balance is an important step in the process of understanding the functioning of a water supply system. With the 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 was addressed.

The different available information gathered for water balance is illustrated in the figure below.

Figure 2: Water balance



The amount bulk water abstracted for Molteno and Sterkstroom was calculated using the "end-use forecast" method. This method allows for scenarios to be developed by incorporating both demand drivers for different end-uses and by achieving higher levels of water efficiency.

In the case of Sterkstroom bulk water is abstracted from boreholes owned by the Inkwanca LM and purchased from others. Molteno on the other hand does not purchase bulk water from others.

8.1A Amount of bulk water abstracted (Ml/year): Molteno

Source	Source name	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1	Molteno Dam		1240	1252	1408	1425	1442	1459
2	Jubilee Dam				300	300	300	300
3								
4								
TOTAL			1240	1252	1708	1725	1742	1759

The above table shows the forecast demand of bulk water to be abstracted in relation to upgrading of higher service levels in Molteno and the addition of the 2000 airstrip housing units developments.

8.1B Amount of bulk water abstracted (Ml/year): Sterkstroom

Source	Source name	Prior	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1:	EC/006/EC, EC/004/EC, EC/002/EC (Sterkstroom)		74	74	74	74	74	74
2	EC/008/EC, EC/009/EC (Masakhe)		8	8	8	8	8	8
3	Lismore		95	95	95	95	95	95
4								
TOTAL			177	177	177	177	177	177

The amount stated for the Lismore borehole is an estimation, the realistic figure should be verified through geohydrological tests. The above table does not show any increase in the forecast demand of the bulk water to be abstracted, as the reported amounts are the current permissible amounts per borehole source.

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

In Molteno there are no service contracts with any other provider or institution for the purchase of bulk water, but in Sterkstroom two service contracts exists.

8.2B Amount of bulk water purchased from others (Ml/year) : Sterkstroom

Source	Purchased from	Contracted supply volume	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1	Carnavon Estates	189	189	189	189	189	189	189	189
2	A Myburgh	148		148					
3									
4									
TOTAL		337		337					

The contracted supply from Carnavon Estates is a fixed amount, the contracted supply from A Myburgh was estimated at 148Ml/year as no formal records exists of the purchase as the geohydrological testing must still be conducted for this borehole.

8.3 Water supplied to consumers (Ml/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 reported in the tables below. The figures reported below refer to the total water balance and not a "treated water balance".

8.3A Water supplied to consumers (Ml/year) – urban: Molteno

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Residential communal water supply		22	0	0	0	0	0
2. Residential controlled volume supply		263	288	912	1100	1299	1470
3. Residential uncontrolled volume supply		685	691	518	346	172	0
4. Industrial supply- Wet							
5. Industrial supply- Dry		8	9	10	11	12	13
6. Commercial supply		7	7	8	8	9	9
7. Other supply (including water supplied to other water services institutions)		5	5	6	6	7	7
8. Sub-total (treated water supplied) (sum 1 to 7)		990	1000	1454	1471	1499	1499
9. Raw water (i.e. supplied untreated)							
10. Recycled (from treated effluent) (must be reported as a negative figure)							
11. Total water supplied (8 + 9 + 10)		990	1000	1454	1471	1484	1499
12. Physical water losses (bulk water supplied minus 11)		250	252	254	256	258	260

Note that the bulk water supplied is the current totals from Tables 8.1A (Amount of bulk water abstracted). Molteno has a lot of un-metered households which result that physical water losses can not be reported on, the above figures for water losses are estimations based on interviews conducted with technical personnel in the Inkwanca LM. The totals of Table 8.1A and table 8.3A correspond.

8.3B Water supplied to consumers (Ml/year) – urban: Sterkstroom

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Residential communal water supply		5	5	0	0	0	0
2. Residential controlled volume supply		170	198	252	323	393	464
3. Residential uncontrolled volume supply		216	192	147	102	57	12
4. Industrial supply- Wet							
5. Industrial supply- Dry							
6. Commercial supply							
7. Other supply (including water supplied to other water services institutions)							
8. Sub-total (treated water supplied) (sum 1 to 7)		392	395	395	425	450	476
9. Raw water (i.e. supplied untreated)							
10. Recycled (from treated effluent) (must be reported as a negative figure)							
11. Total water supplied (8 + 9 + 10)		392	395	395	425	450	476
12. Physical water losses (bulk water supplied minus 11)		122	123	124	132	139	147

Note bulk water supplied is the current totals from Tables 8.1B (Amount of bulk water abstracted) and 8.2B (Amount of bulk water purchased from others). Sterkstroom have a lot of un-metered households which result that physical water losses can not be reported on, the above figures for water losses are estimation based on interviews conducted with technical personnel in Inkwanca LM. The totals of Table 8.1A and table 8.3A correspond only for the current year, it is foreseen that Sterkstroom will have problem in the supply of bulk water in the future as the current sources are being utilised at their full capacity.

8.5 Total physical water losses (Ml/year)

The figures reported below is for the total physical water losses in the Inkwanca LM as contained in the table 8.3A and table 8.3B respectively

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Total physical water losses: Urban		372	375	378	388	397	407
2. Total physical water losses: Rural							
3. Total physical water losses		372	375	378	388	397	407

The figures in the above table are derived from the estimation of the physical water losses in Molteno and Sterkstroom. In order for Inkwanca LM to achieve the exact physical water loss figures in Molteno and Sterkstroom respectively bulk water meters must be installed in the bulk water pipelines feeding the different water reticulation networks.

8.6 Total influent received at treatment works

The wastewater flows to the respective Wastewater Treatment Works were estimated using the figures as reported in table 8.3A and 8.3B. In order to fully operate both WWTW flow meters should be installed on the final influent line.

Source	Resource Name	Works Name	Prior 1		Current		Year 1		Year 2		Year 3		Year 4		Year 5	
			Tot	% Ind	Tot	% Ind	Tot	% Ind	Tot	% Ind	Tot	% Ind	Tot	% Ind	Tot	% Ind
1.	WWTW	Molteno	453 Ml	1%	594	1%	600	1%	872	1%	883	1%	890	1%	899	1%
2.	WWTW	Sterkstroom		0%	235	0%	237	0%	237	0%	255	0%	270	0%	286	0%
3.																
4.																

It should be reported that the Molteno WWTW is currently experiencing capacity problems and cannot cope with the effluent received, in view of the improvement of service levels in Molteno and the planned 2000 airstrip housing development the Molteno WWTW must be upgraded.

9. WATER SERVICES INSTITUTIONAL ARRANGEMENTS PROFILE

In order to address the WSDP goals and service level targets the LM 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.

9.1 WSA functions and outputs

The table below outlines major functions and outputs the Inkwanca LM has to fulfil in terms of the WSA role and responsibilities.

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	No			Yes
Free basic water policy (including equitable share)	No			Yes
Procurement policy	No			Yes
Regulation and tariffs				
Water services bylaws with conditions as required by the Water Services Act	No			Yes
Mechanisms to ensure compliance with bylaws	No			Yes
Tariff structure	Yes			
Tariffs promulgated	Yes			
Infrastructure development (projects)				
Mechanisms to undertake project feasibility studies	No			Yes
Criteria for prioritising projects	No			Yes
Mechanisms to assess and approve project business plans	No			Yes
Mechanisms for selecting, contracting, managing and monitoring implementing agents	No			Yes
Mechanisms to monitor project implementation	No			Yes
Water conservation and demand management				
Water conservation and demand management strategy	No			Yes
Performance management and monitoring				
Performance management system	No			Yes
Water service monitoring and evaluation (M&E) system	No			Yes
WSDP				
WSDP information system	Yes			
Mechanisms for stakeholder participation	Yes			
Mechanisms to monitor and report on WSDP implementation	No			Yes
WSP institutional arrangements				
Criteria to select appropriate WSPs		N/A		
Mechanisms to contract, manage and monitor WSPs		N/A		
Mechanisms to approve WSP business plans		N/A		
WSA overall capacity				
Sufficient staff and systems to fulfil all WSA functions	No			Yes
Other (state)				

9.2 WSA capacity development

There is no information available in terms of WSA capacity development in relation to priority projects. Capacity assessment and development is needed for the WSA (Inkwanca LM).

9.3 Bylaws affecting water services

There are no bylaws affecting water services in the Inkwanca LM according to officials from the LM.

9.4 Water services providers (retail water) – current year

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. Molteno	urban	Inkwanca LM	Municipality	N/A	N/A	100%
2. Sterkstroom	urban	Inkwanca LM	Municipality	N/A	N/A	!00%
3.						
4.						
5.						
6.						
7.						
8.						
Area with no WSP	**Settlement type (urban / rural)**					**% consumers with no WSP**
1. N/A						
2.						
3.						
4.						

9.5 Water services providers (retail water) – 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. Molteno	urban	Inkwanca LM	Municipality	N/A	100%
2. Sterkstroom	Urban	Inkwanca LM	Municipality	N/A	100%
3.					
4.					
5.					
6.					
7.					
8.					
				Total % consumers with WSPs with signed contracts	
				Total % consumers with WSPs with no contracts	
Area with no WSP	**Settlement type (urban / rural)**	**Reason why no WSP**			**% consumers with no WSP**
1. N/A					
2.					
3.					
4.					
				Total % consumers with no WSPs	

9.6 Water services providers (sanitation) – current year

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. Molteno	Urban	Inkwanca LM	Municipality	N/A	N/A	100%
2. Sterkstroom	urban	Inkwanca LM	Municipality	N/A	N/A	100%
3.						
4.						
5.						
6.						
7.						
8.						
Area with no WSP	**Settlement type (urban / rural)**					**% consumers with no WSP**
1. N/A						
2.						
3.						
4.						

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. Molteno	Urban	Inkwanca LM	Municipality	N/A	100%
2. Sterkstroom	urban	Inkwanca LM	Municipality	N/A	100%
3.					
4.					
5.					
				Total % consumers with WSPs with signed contracts	
				Total % consumers with WSPs with no contracts	
Area with no WSP	**Settlement type (urban / rural)**	**Reason why no WSP**			**% consumers with no WSP**
1. N/A					
2.					
3.					
4.					
				Total % consumers with no WSPs	

9.8 Water services providers (bulk water) – current

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 Molteno	Urban	Inkwanca LM	Local Mun.	N/A	N/A	100%
1 Sterkstroom	Urban	Inkwanca LM	Local Mun.	N/A	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	0%

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 Molteno	Urban	Inkwanca LM	Local Mun.	N/A	100%
2. Sterkstroom	Urban	Inkwanca LM	Local Mun.	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					0%

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. Molteno	Urban	Inkwanca	Local Mun.	N/A	N/A	100%
2. Sterkstroom	Urban	Inkwanca	Local Mun.	N/A	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						0%

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 Molteno	Urban	Inkwanca LM	Local Mun.	N/A	100%
3. Sterkstroom	Urban	Inkwanca LM	Local Mun.	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					0%

9.12 Support services agents (water) – current

There are no support service agents in the Inkwanca LM as the LM fulfil the support service role itself and therefore this section and subsequent section regarding support service agents are not applicable.

9.13 Support services agent (water) – year 5

There are no support service agents in the Inkwanca LM as the LM fulfils the support service role itself. It is foreseen that support service role will be continued by the LM for the next 5 years.

9.14 Sanitation promotion agent – current

There are no sanitation promotion agents in the Inkwanca LM as the LM will fulfil the role itself and therefore this section is not applicable.

9.15 Sanitation promotion agent – year 5

There are no sanitation promotion agents in the Inkwnaca LM as the LM will fulfil the role itself. It is foreseen that sanitation promotion agent role will be continued by the LM for the next 5 years.

9.16 Support service contracts - current

There is currently no service contracts contracted to outside parties and it is foreseen that this trend will continue in the Inkwanca LM

9.17 WSP staffing levels: water

The table below shows the staffing levels for water services in the Inkwanca LM. The two tables correspond with the attached organisational structure of the Inkwanca LM.

	Number of employees					
	Executive and senior management	**Middle management**	**Clerical**	**Supervisory or artisan**	**General worker**	**Total**
1. Finance and administration	1		4	3	3	11
2. Projects and planning	1					1
3. Operations	1			1	4	6
4. Bulk service						
5. Distribution services						
6. Customer services	1					1
7. Total	4					
8. Projection of total in five years time	N.A.	N.A	N.A.	N.A.	N.A.	N.A.

9.18 WSP staffing levels: sanitation

	Executive and senior management	**Middle management**	**Clerical**	**Supervisory or artisan**	**General worker**	**Total**
1. Finance and administration	1	0	4	3	3	11
2. Projects and planning	1					1
3. Operations	1			1	14	16
4. Bulk service						
5. Distribution services						
6. Customer services	1					1
7. Total	4		4	4	17	29
8. Projection of total in five years time	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

9.19 WSP training programmes

Inkwanca LM indicated that there are no training programmes relating water services.

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.

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.

10.1A Quality of service for water: urban : Molteno

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Total no. of consumers		20 728	20 935	21 144	21 355	21 658	21 784
2. No. of consumers experiencing greater than 7 days interruption in supply per year		0	0	0	0	0	0
3. No. of consumers receiving flow rate of less than 10 litres per minute		N/A	N/A	N/A	N/A	N/A	N/A
4. Water quality: no chlorination		0	0	0	0	0	0
5. Water quality: chlorinated		0	0	0	0	0	0
6. Water quality: full treatment		20 728	20 935	21 144	21 355	21 658	21 784

10.1B Quality of service for water: urban : Sterkstroom

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Total no. of consumers		10 551	10 656	10 764	10 877	10 991	11 111
2. No. of consumers experiencing greater than 7 days interruption in supply per year		0	0	0	0	0	0
3. No. of consumers receiving flow rate of less than 10 litres per minute		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
4. Water quality: no chlorination		10 551	10 656	10 764	10 877	10 991	11 111
5. Water quality: chlorinated		0	0	0	0	0	0
6. Water quality: full treatment		0	0	0	0	0	0

10.2 Quality of service for water: rural

Not applicable

10.3 Attending to complaints for water: urban

This section measures how effective the municipality is in terms of responding to and addressing complaints related to water provision. The figures reported in the tables below were obtained from the Public Participation questionnaires answered by the various residents of Sterkstroom and Molteno and should only be taken as an indication and not as the realistic figures as none were available.

10.3A Attending to complaints for water: urban : Molteno

	Prior 1	Current	Target Year 1	Target Year 2	Target Year 3	Target Year 4	Target Year 5
1. Total number of consumer units		3 671	3 708	5 745	5 745	5 745	5 745
2. No. complaints of quality of service per year divided by total number of consumer units		0.4	0.35	0.3	.25	0.2	0.2
3. Number of queries received within the year		1 468	1 297	1 723	1 436	1 149	1 149
4. % queries responded to within 24 hours		25	30	35	40	45	50
5. Number of major or visible leaks reported within the year		211	213	215	217	223	225
6. % major or visible leaks repaired within 48 hours after being reported.		100	100	100	100	100	100

If the above figures are taken as an indication to service delivery in terms of water services in Molteno, the Inkwanca LM can then use these figures as targets for improving service delivery in Molteno. It is foreseen that the number of queries and complaints will depreciate proportionately as the Inkwanca LM improves services delivery. The number of leaks reported is foreseen to increase due to the existing water distribution network ageing.

10.3B Attending to complaints for water: urban: Sterkstroom

	Prior 1	Current	Target Year 1	Target Year 2	Target Year 3	Target Year 4	Target Year 5
1. Total number of consumer units		2146	2167	2188	2209	2231	2253
2. No. complaints of quality of service per year divided by total number of consumer units		0.89	0.80	0.71	0.62	0.53	0.44
3. Number of queries received within the year		1 909	1733	1553	1369	1182	991
4. % queries responded to within 24 hours		2	30	35	40	45	50
5. Number of major or visible leaks reported within the year		897					
6. % major or visible leaks repaired within 48 hours after being reported.		69	74	79	84	89	94

If the above figures are taken as an indication to service delivery in terms of water services in Sterkstroom, the Inkwanca can then use these figures as targets for improving service delivery in Sterkstroom.

It is foreseen that the number of queries and complaints will depreciate proportionately as the Inkwanca LM improves services delivery in Sterkstroom. It should be an aim of the Inkwanca LM to have to same service delivery levels in Molteno and Sterkstroom. The number of leaks reported is high and this figure must first be verified before any other reporting on the matter can be done.

10.4 Attending to complaints for water: rural

Not applicable.

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. Again it must be noted that the figures reported in the tables below were obtained from the completed Public Participation questionnaires and should be taken as an indication and not as the realistic figures as none were available.

10.5A Attending to complaints for sanitation: urban: Molteno

	Prior 1	Current	Target Year 1	Target Year 2	Target Year 3	Target Year 4	Target Year 5
Discharge to treatment works							
1. Number of queries/ complaints received within the year		1 101	1 038	1 443	1 378	1 263	1 149
2. % queries responded to within 24 hours		33	40	45	50	55	60
3. Number of blockages reported within the year		440	415	597	551	505	459
4. % blockages repaired within 48 hours after being reported		33	45	55	65	75	85
5. No. complaints per year divided by total number of consumer units		0.3	0.28	0.26	0.24	0.22	0.2
Pit/tank pumping							
6. Number of pits/ tanks		46	46	0	0	0	0
7. Number of calls received within the year for emptying		26	26	0	0	0	0
8. Number of calls received within the year for emergency maintenance to pits/ tanks		N/A	N/A	0	0	0	0

If the above figures are taken as an indication to service delivery in terms of sanitation services in Molteno, the Inkwanca LM can then use these figures as targets for improving service delivery in Molteno. It is foreseen that the number of queries will decrease for year 1 and then increase with the addition of the 2000 airstrip housing units after which it will depreciate proportionately as the Inkwanca LM improves services delivery to the residents. The pit tank pumping operations in Molteno will cease to exist as the implementation of a priority project will see the pit tanks being replaced by waterborne sewers by the year 2. The blockages reported will increase proportionally to the increase in consumer units.

10.5B Attending to complaints for sanitation: urban: Sterkstroom

	Prior 1	Current	Target Year 1	Target Year 2	Target Year 3	Target Year 4	Target Year 5
Discharge to treatment works							
1. Number of queries/ complaints received within the year		1751	1667	1587	1511	1439	1370
2. % queries responded to within 24 hours		0	40	45	50	55	60
3. Number of blockages reported within the year		280	282	285	288	291	294
4. % blockages repaired within 48 hours after being reported		0	45	55	65	75	85
5. No. complaints per year divided by total number of consumer units		0.81	0.76	0.71	0.66	0.61	0.56
Pit/tank pumping							
6. Number of pits/ tanks							
7. Number of calls received within the year for emptying							
8. Number of calls received within the year for emergency maintenance to pits/ tanks							

If the above figures are taken as an indication to service delivery in terms of sanitation services in Sterkstroom, the Inkwanca LM can then use these figures as targets for improving service delivery in Sterkstroom. It is foreseen that the number of queries will decrease proportionately as the Inkwanca LM improves services delivery to Sterkstroom. It should be an aim of the Inkwanca LM to have to same service delivery levels in Molteno and Sterkstroom. The blockages reported will increase proportionally to the increase in consumer units.

10.6 Attending to complaints for sanitation: rural

Not applicable

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.

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

10.7 Education for basic water services (Molteno and Sterkstroom)

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	0	0	0	0
2. Water education (including water conservation)		0	0	0	0	0	0

The Inkwanca LM does not have any education programme for basic water services in place and is definitely a matter that must be taken up in the IDP and properly plan for with assistance from government organisations.

10.8 Pollution awareness

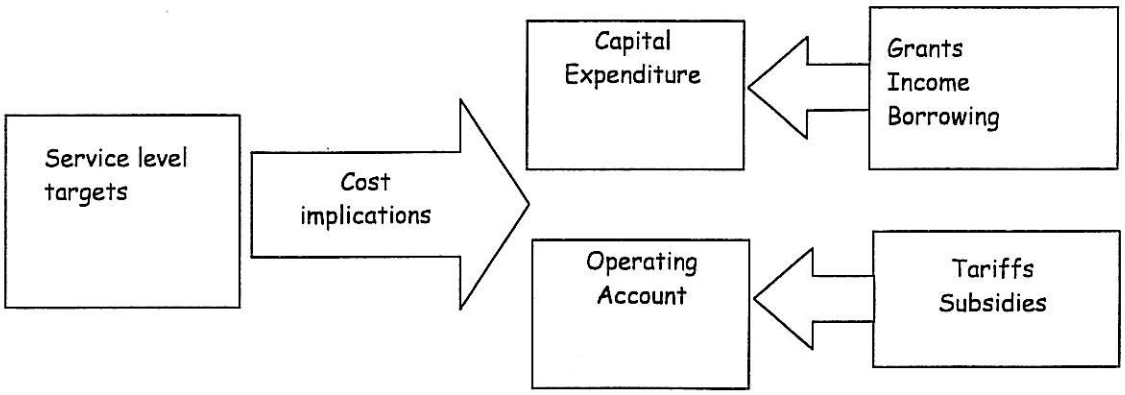
1. Does the WSA have a pollution awareness programme?	Yes	No
2. If no, when will such a programme be in place?	Council to build into IDP	

The same argument as reported in 10.7 will be applicable here.

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.

Figure 3 : Finance overview



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.

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.

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. The indigent policy regarding water services in the Inkwanca LM is still process of being developed and is one of the strategies list in the IDP in obtaining the objective to implement an appropriate and affordable water and sanitation services policy. (Refer paragraph 2.2)

11.1 Capital expenditure: water

The figures for this section could not be estimated due to the Inkwanca LM still developing the indigent policy regarding water and sanitation services.

11.2 Capital expenditure: sanitation

The figures for this section could not be estimated due to the Inkwanca LM still developing the indigent policy regarding water and sanitation services.

Sources of 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	▪ 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)
Capital grant funding from other sources	▪ Mvula Trust ▪ Donors ▪ Water boards
Funding available from local government itself	▪ 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	▪ Loans from private banks and the DBSA
Consumer contributions	▪ 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	▪ Depending on the particular context, there might be additional sources of finance from the private sector.

11.3 Sources of capital income: water

Sources for capital income as stated in the IDP of the Inkwanca LM with regard to water are the following :

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
Subsidies							
1. Housing							
2. CMIP		R 1425000	R 450000				
3. CWSS (from DWAF)							
4. Sub-total: subsidies		R1452000	R 450000				
Other income							
5. Other ad hoc grants which may become available		0	0				
6. Consumer payments		0	0				
7. Expenditure from current income		0	0				
8. Sub-total (5 + 6 + 7):		0	0				
Loans							
9. Capital development fund		0	0				
10. External		0	0				
11. Sub-total: loans		0	0				
12. Total (4 + 8 + 11)		R 1452000	R 450000				

11.4 Sources of capital income: sanitation

Sources for capital income as stated in the IDP of the Inkwanca LM with regard to sanitation are the following :

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
Subsidies							
1. Housing		0	0	0	0	0	0
2. CMIP		R 3 400 000	R 500 000	R 500 000	R 452 000	0	0
3. CWSS (from DWAF)		0	0	0	0	0	0
4. Sub-total: subsidies		R 3 400 000	R 500 000	R 500 000	R 452000	0	0
Other income							
5. Other ad hoc grants which may become available		0	0	0	0	0	0
6. Consumer payments		0	0	0	0	0	0
7. Expenditure from current income		0	0	0	0	0	0
8. Sub-total (5 + 6 + 7):		0	0	0	0	0	0
Loans							
9. Capital development fund		0	0	0	0	0	0
10. External		0	0	0	0	0	0
11. Sub-total: loans		0	0	00	0	0	0
12. Total (4 + 8 + 11)		R 3400000	R 500000	R500000	R 452000	0	0

11.5 Operating costs: water

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Purchase of bulk water	N.A.	N.A.					
2. Production costs (raw water if from own sources)	N.A.	N.A.					
3. Production costs (treatment system)	R101439	R 120000					
4. Operating costs (including overheads, salaries and wages, maintenance and depreciation)	R457600	R 497000					
5. Finance charges	N/A	N/A					
6. Other	N/A	N/A					
7. Total costs (1 + 2 + 3 + 4 + 5 + 6)	R559039	R617000					
8. Operating costs per consumer unit							

Operating costs for water differ from Molteno to Sterkstroom. In Molteno operating costs are only purification costs while in Sterkstroom bulk water is purchased and then there are still production costs to transport the water via pipelines to Sterkstroom. Since the amalgamation of the two former TLCs the financial management of the Sterkstroom unit has caused the Inkwanca LM a lot of problems. It must be pointed out that the Inkwanca LM are in the process of establishing efficient financial management structure in the Sterkstroom unit. In regard to the previous certain figures pertaining to the operating costs of water in Sterkstroom are not available and making it impossible to calculate the operating costs for water per consumer unit. The figures reported in the above table are those figures that are currently available.

11.6 Operating costs: sanitation

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Treatment costs	R135500	R148698					
2. Operating costs (including overheads, salaries and wages, monitoring, maintenance and depreciation)	R514857	R468684					
3. Finance charges							
4. Other	26085	26085					
5. Total costs (1 + 2 + 3 + 4)	R676442	R643467					
6. Operating costs per consumer unit							

As mentioned in paragraph 11.5 certain costs for Sterkstroom are not available making it impossible to calculate the operating costs for sanitation per consumer unit.

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 indigent policy that requires that poor households be identified and the conditions of subsidisation be clearly spelt out. The Inkwanca LM provided the following information regarding the distribution of the equitable share.

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Equitable share allocation	R1066635	R3885000					
2. % Equitable Share allocated to basic water supply	22.45%	6.16%					
3. % Equitable Share allocated to basic sanitation provided	N/A	N/A					
4. % of other subsidies allocated to basic water supply	N/A	N/A					
5. % of other subsidies allocated to basic sanitation provision	N/A	N/A					

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. As reported in the beginning of

paragraph 11 the Inkwanca LM is in the process of developing its indigent policies for water and sanitation services.

In the indigent policies t 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 Inkwanca LM could only provide fixed charge figures (as shown in table 11.9 & 11.10) as the indigent policy for water and sanitation services are being developed.

11.9 Fixed charges: residential (per month) for water

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Communal water supply	R 10.33	R 12.40					
2. Controlled volume supply							
3. Uncontrolled volume supply	R 23.68	R26.05					

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	R 22.29	R 24.51					
2. Consumer installations: Wet (septic tanks etc.)	R 70.00	R 77.00					
3. Discharge to water treatment works (intermediate or full waterborne)	R48.17	R 52.95					

11.11 Volume charges or other charge mechanisms: residential sanitation

The information for this section is not available as yet due to the Inkwanca LM developing the indigent policy regarding water and sanitation services.

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

The information for this section is not available as yet due to the Inkwanca LM developing the indigent policy regarding water and sanitation services.

11.13 Subsidy targeting approach for free basic water

The information for this section is not available as yet due to the Inkwanca LM developing the indigent policy regarding water and sanitation services.

11.14 Fixed charges and block tariffs: industrial for water

The information for this section is not available as yet due to the Inkwanca LM developing the indigent policy regarding water and sanitation services.

11.15 Fixed charges and block tariffs: industrial for wastewater

The information for this section is not available as yet due to the Inkwanca LM developing the indigent policy regarding water and sanitation services.

11.16 Fixed charges and block tariffs: commercial for water

The information for this section is not available as yet due to the Inkwanca LM developing the indigent policy regarding water and sanitation services.

11.17 Fixed charges and block tariffs: commercial for wastewater

The information for this section is not available as yet due to the Inkwanca LM developing the indigent policy regarding water and sanitation services.

11.18 Fixed charges and block tariffs: other for water

The information for this section is not available as yet due to the Inkwanca LM developing the indigent policy regarding water and sanitation services.

11.19 Fixed charges and block tariffs: other for sanitation

The information for this section is not available as yet due to the Inkwanca LM developing the indigent policy regarding water and sanitation services.

11.20 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. The following figures were received from Inkwanca LM for income and expenditure on water :

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Total income (billed income and subsidies)	R 1311657	R1375932					
2. Actual income received	R590245	R639808					
3. % non-payment	44.99%	40.50%					
4. Non-payment by residential consumers	R432847	R427227					
5. Non-payment by commercial consumers	R144282	R102507					
6. Non-payment by industrial consumers	R13248	R27519					
7. Non-payment by other consumers	N/A	N/A					
8. Total non-payment (4+5+6+7)	R590377	R557253					
9. Operating expenditure	R370200	R405000					
10. Capital expenditure	R87400	R92000					
11. Total expenditure (9+10)	R457600	R497000					
12. Equitable share allocated to water supply	R239400	R239400					
13. Surplus (deficit) (2 minus 11)	R132645	R142808					

In view of the fact that the Inkwanca LM is still developing the indigent policy for water and sanitation services it is thus foreseen that figures are due to change in the future once the indigent policy is in place.

11.21 Total income (and non-payment) and expenditure: sanitation

The following figures were received from the Inkwanca LM for income and expenditure on sanitation :

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
1. Total income (billed income and subsidies)	R1 339 550	R1 682 844					
2. Actual income	R535 820	R707 130					
3. % non-payment	60.90%	57.98%					
4. Non-payment by residential consumer	R642 984	R807 765					
5. Non-payment by commercial consumers	R96 448	R121 165					
6. Non-payment by industrial consumers	R 48 224	R 60 582					
7. Non-payment by other consumers	N/A	N/A					
8. Total non-payment (4+5+6+7)	R 787 656	R 989 512					
9. Operating expenditure	R 751 130	R 725 042					
10. Capital expenditure	R 55 085	R 66 085					
11. Total expenditure (9+10)	R 806 215	R 791 127					
12. Surplus (deficit) (2 minus 11)	R 270 395	R 83997					

In view of the fact that the Inkwanca LM is still developing its indigent policy for water and sanitation services it is thus foreseen that figures are due to change in the future once the indigent policy is in place.

11.22 Sales arrangements

The type of billing in place is consolidated system i.e. all services (water, sanitation, electricity and refuse removal) are included in one bill and is computerised. Delivery of bills is done by hand to all consumers in reach and by mail to institutions such as

Telkom, Eskom and others. There used to be debt collectors before, but the Municipal offices are the paypoint for everyone.

The credit control policy is being applied together with by-laws to every consumer. Two letters of demand are written to consumers who do not settle their debts in two months and if such consumers do not respond, the services are being terminated on the 20th of the following month.

11.23 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.

	Prior 1	Current	Year 1	Year 2	Year 3	Year 4	Year 5
Communal supply							
1. % communal standpipes metered	N/A	N/A					
2. % communal standpipes metered (prepaid)	N/A	N/A					
Controlled volume supply							
3. % consumers billed monthly	N/A	N/A					
Uncontrolled volume supply							
4. % consumers billed monthly		100%	100%	100%	100%	100%	100%
5. % consumers meters read monthly		100%	100%	100%	100%	100%	100%
6. % consumers consumption estimated		3.56%					
Paypoints							
7. No. billed consumer units/paypoint	2	2	2	2	2	2	2
8. No. prepaid consumer units/outlet	N/A	N/A					
General							
9. Number of new meters installations			808	808	808	808	808
10. % meters tested							
11. % meters replaced							

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.

12.1 Annual water and sanitation project list

Projects recorded in the table below refer to new infrastructure to be built.

12.1A Annual water and sanitation project list : Molteno

Project Name	Settlement type	Water / Sanitation	Project Type (e.g. bulk, reticulation, etc)	Amount	Funding source	Year
Molteno Bulk Water Supply	Urban	Water	Bulk	R 1,100,000.00	CMIP	Current/ Year 1
Molteno Water Reticulation	Urban	Water	Reticulation	R 1,700,000.00	CMIP	Current
Molteno Water Meters	Urban	Water	Reticulation	R 2,300,000.00	CMP: DM: Inkwanca LM	Current/ Year 3
Molteno Sanitation	Urban	Sanitation	Network	R 540,000.00	Both DM and DWAF	Current/ Year 2
Molteno Housing	Urban	Both	Housing	R 1,856,000.00	Dept. of Econonic Affairs: Environment and Tourism: LED	Current/ Year 1
Molteno Housing	Urban	Both	Housing	R 12,800,000.00	Provincial Housing Board	Current/ Year 1
Molteno Housing	Urban	Both	Housing	R 64,000,000.00	Provincial Housing Board	Current/ Year 3
Community Gardens	Urban	Water	Community Gardens	R 510,000.00	Dept. of Economic Affairs: Environment and Tourism: LED	Current /Year 2

All the planned housing projects in Molteno are also listed above as it has a direct influence on the water and sanitation infrastructure.

12.1B Annual water and sanitation project list: Sterkstroom

Project name	Settlement type	Water/ sanitation	Project type (e.g. bulk, reticulation, etc.)	Amount	Funding source	Year
Sterkstroom Bulk Water	Urban	Water	Bulk	R2 380 000.00	Both CMIP & DM	2004
Sterkstroom Water Supply	Urban	Water	Reticulation	R 250 000.00	CMIP	2004
Sterkstroom Water Metres	Urban	Water	Water Metres	R1 740 000.00	CMIP, Inkwanca Mun, DM	2007
Sterkstroom Sanitation	Urban	Sanitation	House connections	R1 452 000.00	Chris Hani DM, Inkwanca Mun, DM	2006
Sterkstroom Housing	Urban	Housing	721 Houses	R11 536 000.00	Provincial Housing Board	2004
Sterkstroom Housing	Urban	Housing	1300 Houses	R20 800 000.00	Provincial Housing Board	2006
Community Gardens	Urban	Gardening	Water	R 510 000.00	(Economic Affairs, Environment & tourism) departments , LED Fund	2004

All the planned housing projects in Sterkstroom are also listed above as it has a direct influence on the water and sanitation infrastructure.

12.2 WSA sustainability project list

DWAF has initiated a Sustainability Allocation within the Community Water Supply and Sanitation Capital Programme (CWSSCP). The purpose of the Sustainability Allocation is to:

- ensure sustainable water services for those areas within which RDP schemes have been implemented (retrofit projects); and
- provide support to Water Services Authorities in ensuring sustainable water services (WSA capacity development projects).

There are no sustainability projects planned for the next financial year in the Inkwanca LM.

13 INTEGRATED DEVELOPMENT PLANNING PROJECTS

The projects programmed for the next five years from 2002 to 2007 are shown in the table below as the Project Implementation Summary. All the projects in this table have an assigned criteria classification in terms of the IDP process. The purpose of prioritising the projects is to ensure a smooth delivery link by providing proposals with tentative target figures, technical standards, locations, time horizons and cost estimate.

13.1 Project Implementation Summary

PRIORITY	PROJECT	REFERENCE
Water and Sanitation	Molteno bulk water supply	1
	Sterkstroom bulk water supply	2
	Molteno water reticulation	3
	Sterkstroom water reticulation	4
	Inkwanca water meters	5
	Molteno sanitation	6
	Sterkstroom sanitation	7
Roads and Stormwater	Molteno and Sterkstroom access road upgrading	8
	Inkwanca rural road maintenance	9
	Molteno and Sterkstroom internal road upgrading	10
Electricity	Molteno area and street lighting	11
	Sterkstroom area and street lighting	12
Housing	Molteno Housing: 116 houses	13
	Sterkstroom Housing: 721 houses	14
	Molteno Housing: 800 houses	15
	Molteno Housing: 4000 houses	16
	Sterkstroom Housing: 1300 houses	17
Land and Agriculture	Commonage Management and Expansion	18
	Land for residential purposes	19
	Upgrade security of tenure	20
	Expansion of the Koos Ras Game Reserve	21
Poverty	LED Framework and Institutional Structure	22
	Community gardens	23
	Inkwanca Piggery Projects	24
	Local food production	25
	Molteno Cultural Village	26
	Coal and clay mining	27
	Skin and hyde industry	28
Health (HIV/AIDS)	HIV/AIDS Plan and Programme	29
	Health support system	30
	Clinic upgrade	31
Education	Multi-purpose Skills Centre (Molteno)	32
	Multi-purpose Skills Centre (Sterkstroom)	33
	New Nolitho Primary School	34
	Upgrade Dennekruin Primary School	35
	New Masakhe Primary School	36
	Provision of crèches/Pre-schools in Molteno	37
	Provision of crèches/Pre-schools in Sterkstroom	38
Sports and Recreation	Molteno Sport Complex	39
	New Sterkstroom Sport Complex	40
Crime	Strengthen Community Policy	41
Environment/ Natural Resources	Anti-littering Campaign	42
	New dumping site (Molteno)	43
	New dumping site (Sterkstroom)	44
	Tree Planting Campaign	45
Disaster Management	Disaster Management Plan and Programme	46

13.2 WSDP PLANNING PROJECTS

The priority water and sanitation related projects as identified through the completion of the WSDP and programmed for the next five years from 2002 to 2007 are shown in the following table as the WSDP Project Implementation Programme. All the projects in the table were assigned criteria classification in terms of the priority through the completion of the WSDP.

Table 13.2: WSDP Project Implementation Programme

Project No	Description	Criteria	Timeframe	Cost Estimation	Correspond with IDP
WSDP 1	Molteno Bulk Water Supply	Critical	2002 – 2004	R 2 100 000	Yes
WSDP 2	Sterkstroom Bulk Water Supply : Carnavon Estate	Critical	2002 – 2004	R 2 380 000	Yes
WSDP 3	Sterkstroom Bulk Water Supply : Phase 2 : Albert Myburgh, Chris Hani, Sterkstroom 1-6 boreholes	Critical	2003 – 2005	R 6 700 000	No
WSDP 4	Molteno Waste Water Treatment Works	Critical	2003 – 2005	R 5 000 000	No
WSDP 5	Molteno Water Reticulation	Critical	2002 – 2003	R 1 700 000	Yes
WSDP 6	Sterkstroom Water Reticulation	Critical	2003 – 2004	R 250 000	Yes
WSDP 7	Inkwanca Water Meters	Critical	2002 – 2006	R 4 041 000	Yes
WSDP 8	Molteno Bulk Water Meters & water inefficiency study	Important	2003 – 2004	R 350 000	No
WSDP 9	Sterkstroom Bulk Water Meters & water inefficiency study	Important	2003 – 2004	R 350 000	No
WSDP 10	Sterkstroom Sanitation	Critical	2002 – 2006	R 1 452 000	Yes
WSDP 11	Molteno Sanitation	Critical	2002 – 2005	R 540 000	Yes

13.2.1 Project no. WSDP1 : Molteno Bulk Water Supply

Molteno should have an assured supply of water if abstraction from both the Molteno dam and Jubilee dam can take place. The Molteno WTP does not have the capacity to meet with the current nor projected future demand in terms of potable water for Molteno. The first phase of the Molteno Bulk Water Supply will be the mechanical upgrading of the Molteno WTP to meet the future demand taking into account the addition of the 2000 airstrip housing project while service delivery to Nomonde and Dennekruin are also improved. Part of the first phase will also involve the upgrading of the rising main from Jubilee dam to the WTP as reported in paragraph explained 8.1A.

The second phase of the Molteno Bulk Water Supply project will involve the construction of an additional storage reservoir. The current storage capacity at the Molteno storage reservoirs is 1900 kl which in relation to the existing population of Molteno equals 36 hours storage capacity. In the adopted Inkwanca LM IDP an amount of R 1 000 000 has been budgeted for the construction of a storage reservoir taking into account current civil industry prices the construction of a storage reservoir of 800 kl will only be possible. The combined storage reservoir capacity will thus increase to 2 700 kl which seems to be adequate to meet the 48 hours storage capacity in the year 5 provided that the population of Molteno increase at the effective growth rate of 1% as stated in paragraph 3.6 and that there is no great influx of residents from the surrounding farming community.

This project ranks as the highest priority in the Inkwanca LM due to the existing problems being experienced and the projected future demand for potable water in Molteno.

13.2.2 Project no. WSDP2 : Sterkstroom Bulk Water Supply

Sterkstroom currently experiences problems with the water sources. This priority project will involve the upgrading of the waterline from Carnavon Estate, the upgrading of borehole equipment to existing boreholes in and around Sterkstroom and the geohydrological survey of the boreholes around Sterkstroom in order to determine the safe yield of the boreholes. The upgrading of the rising main will minimise the water losses being experienced currently. Due to the frequent water shortage experienced in Sterkstroom this project is critical of nature and ranks as the second highest priority project in the Inkwanca LM. This correlates with the adopted Inkwanca LM IDP.

13.2.3 Project no. WSDP3 : Sterkstroom Bulk Water Supply : Phase 2

This project is not listed in the IDP and should be added as critical priority project no.3 in the IDP.

A report by Kwezi V3 Engineers namely Sterkstroom ; Augmentation of Bulk Water Supply Scheme investigated the water source problems in Sterkstroom. Certain proposals were suggested in the report to ensure that Sterkstroom has an assured bulk water supply. In paragraph 8.2B it was reported that bulk water are abstracted

from the Albert Myburgh and Lismore boreholes, the yields of these boreholes are unknown. The first phase of proposed project will consist of :

- Geohydrological investigation for all the boreholes in and round Sterkstroom
- Purchasing Albert Myburgh property
- Equipping the Albert Myburgh boreholes properly
- Constructing a new rising from Albert Myburgh boreholes

The second phase of the proposed project includes:

- Upgrade Sterkstroom boreholes 2 & 4 and the Lismore boreholes
- Equip Sterkstroom 6 and Chris Hani boreholes
- New rising mains from Sterkstroom 6 and Chris Hani boreholes

The above proposed project will ensure that Sterkstroom has an assured bulk water supply. Reference is made to the problems experienced in the past and projected future shortcomings as calculated in this WSDP, necessitates that this proposed project ranks as the 3rd highest priority project and should be included in the IDP.

13.2.4 Project no. WSDP4 : Molteno Waste Water Treatment Works

This project was not listed in the IDP and should be added to the IDP as priority project no.4.

Currently the existing WWTW at Molteno can only just cope with the effluent received from Molteno. Numerous housing projects are planned for Molteno in which all those houses will receive waterborne sewers thus overloading the current oxidation ponds system. The construction of an anaerobic reactor at the Molteno WWTW is necessary with the addition of circulation system at the WWTW. Certain of the oxidation ponds need rehabilitation as well.

DWAF Free State has been monitoring the situation at the WWTW at Molteno as regular over flows occurred due to the overloading of the system. The planned housing developments can not commence without the Molteno WWTW being upgraded, therefore this proposed project receiving the rating as being the 4th highest rank priority project in the Inkwanca LM.

13.2.5 Project no. WSDP5 : Molteno Water Reticulation

681 households in Nomonde needs water on site connections as to improve the service delivery to these erven. This projects was originally rated as the 3rd highest priority project in the Inkwanca LM IDP but due to the nature of the previous 2 projects it will now only be the 5th highest priority project.

13.2.6 Project no. WSDP6 : Sterkstroom Water Reticulation

100 households in Masakhe need water on site connections as to improve the service delivery to these erven. This projects was originally rated as the 4th highest priority project in Inkwanca LM IDP but due to the nature of WSDP3 and WSDP4 projects it will now only be the 6th highest priority project.

13.2.7 Project no. WSDP7 : Inkwanca Water Meters

Section 6 of this WSDP reports mainly on water conservation and demand management. Reporting on section was not possible due to lack of any formal records as not all the households in Molteno and Sterkstroom have metered water on site connections. In order to facilitate in the process water conservation and demand management the Inkwanca LM with the implementation of this project facilitate the processes of recording the water usage and demand. The installation of the water meters are of critical nature as it will improve the revenue sources for the Inkwanca LM as consumers will pay for water volume usage. This priority project in the WSDP project implementation programme ranks 7th highest in terms of priority.

13.2.8 Project no. WSDP8 : Molteno Bulk Water Meters & Water Inefficiency study

The need for this project was recognised in view of section 6 & 8 of this WSDP. Molteno does not have any bulk water therefore making it impossible to report on water losses and water usage patterns. The proposed project will involve the installation of bulk water meters in the Molteno bulk water distribution network. Once the bulk water meters have been installed records for a time period of 3months preferably during the summer will be kept to ascertain water usage and water losses in the system. Once the recorded figures are available possible water conservation proposals can be submitted to the Inkwanca LM in order to cut down on water losses which in term will cut down on operating costs for the LM. This proposed project is important of nature and ranks as the 8th highest priority project.

13.2.9 Project no. WSDP9 : Sterkstroom Bulk Water Meters & Water Inefficiency study

The need for this project was recognised in view of section 6 & 8 of this WSDP. Sterkstroom does not have any bulk water therefore making it impossible to report on water losses and water usage patterns. The proposed project will involve the installation of bulk water meters in the Sterkstroom bulk water distribution network. Once the bulk water meters have been installed records for a time period of 3 months preferably during the summer will be kept to ascertain water usage and water losses in the system. Once the recorded figures are available possible water conservation proposals can be submitted to the Inkwanca LM in order to cut down on water losses which in term will cut down on operating costs for the LM. This proposed project is important of nature and ranks as the 9th highest priority project.

13.2.10 Project no. WSDP10 : Sterkstroom Sanitation

726 households in Masakhe are in need waterborne sewers as to improve the service delivery to these households. This projects was originally rated after the Molteno sanitation project but is assessed to be more critical in that the service delivery will reach more households. It should also be noted that during the Public Participation Process held in Sterkstroom more complaints regarding the existing sanitation situation were received in regard to the same PPP in Molteno. This priority project ranks as the 10th highest priority project.

13.2.11 Project no. WSDP11 : Molteno Sanitation

270 households in Nomonde are in need waterborne sewers as to improve the service delivery to these households. This priority project ranks as the 11th highest priority project.

13.3 WSDP planning Projects vs integrated planning projects

It is evident to note that the Integrated Planning projects adopted by the Inkwanca Local Council are those project identified by the WSDP as being critical of nature. The additional projects that were identified in this WSDP should be added to priority project list of projects with the ranking as discussed in the previous paragraphs. The preparation of the WSDP forms an integral part of the IDP process and as such provide comparisons in priority criteria assigned to projects in relation of the IDP process versus the WSDP process.

14. CONCLUSION

It is trusted that the contents of this WSDP highlight the needs and shortcomings of the water and sanitation services in Molteno and Sterkstroom. It is evident that the IDP Process and WSDPs are current realities running concurrently, ultimately ensuring realistic and feasible Project Implementation Programmes to be implemented by Inkwanca Local Municipality.

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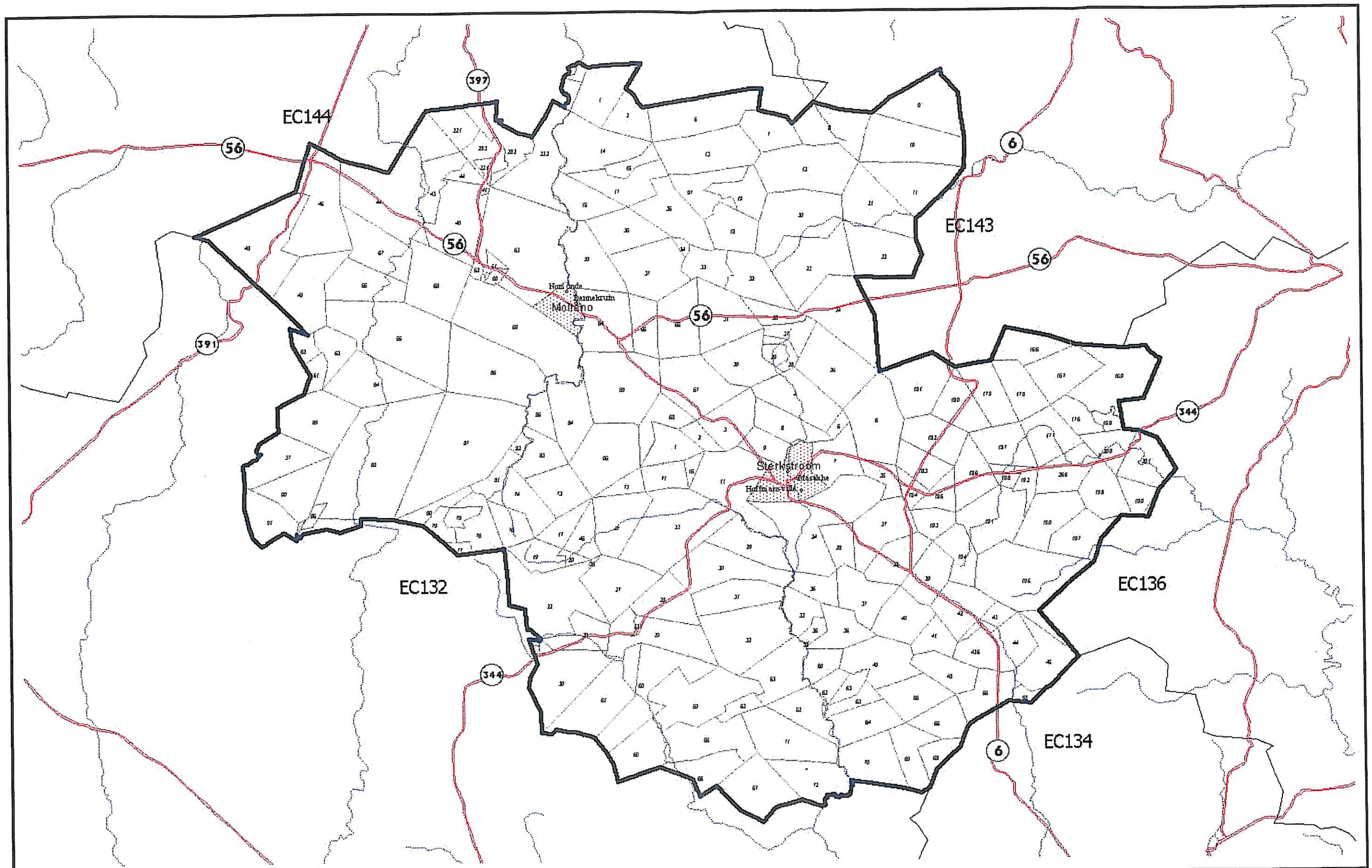


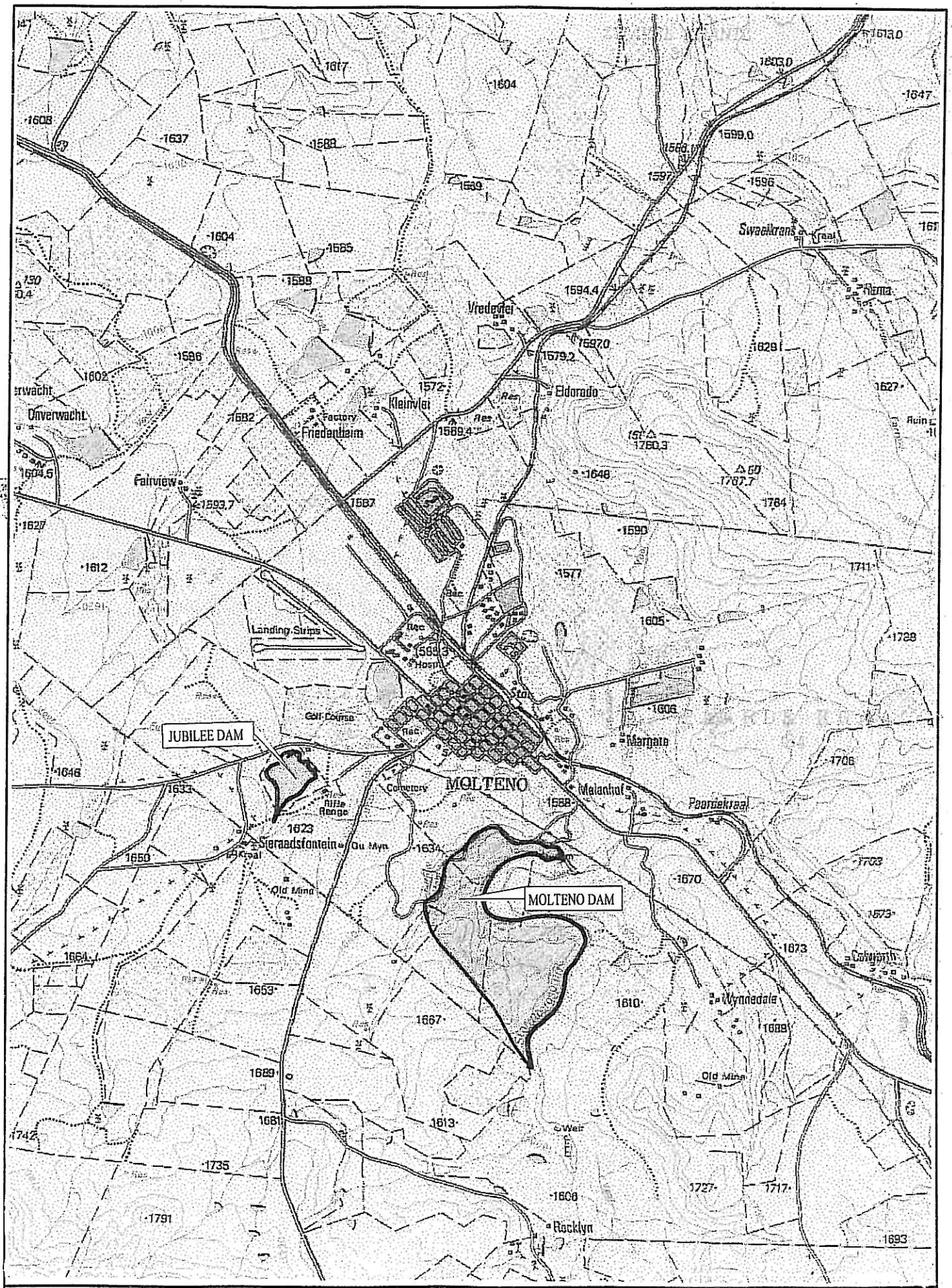
Re-determination of the outer boundary of Local Municipality EC133
in terms of Section 21(b) of the Local Government :
Municipal Demarcation Act, No 27 of 1998.

Date : February 2000

Map No. Kaart Nr. 26

Additional informaton relating to this map can be obtained by contacting the Municipal Demarcation Board at:
Tel: 012- 3422481 Toll-free : 0800-111-006
Fax: 012-3422480 email: mdb@dataworld.co.za
Internet: www.demarcation.org.za
Postal : Private Bag X28, Hatfield, 0028

Place Names obtained from Statistics South Africa
Cadastral descriptions are based on digital information supplied by the Surveyor-General's Office.



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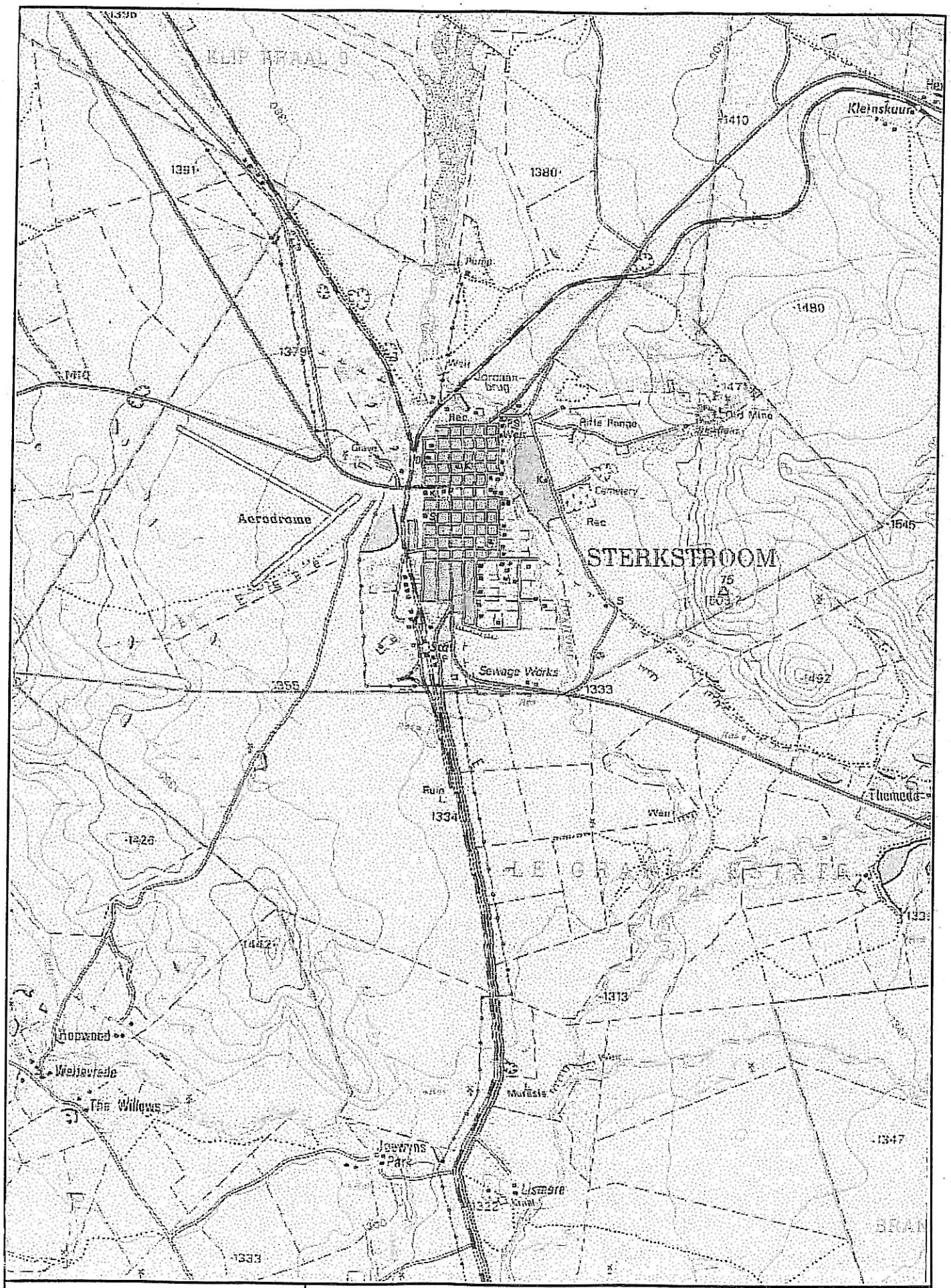
INKWANCA:
WATER SERVICES DEVELPOMENT PLAN
MOLTENO LOCALITY PLAN

Scale: NTS
Date: NOVEMBER 2002
Drawing number: 18505000/1



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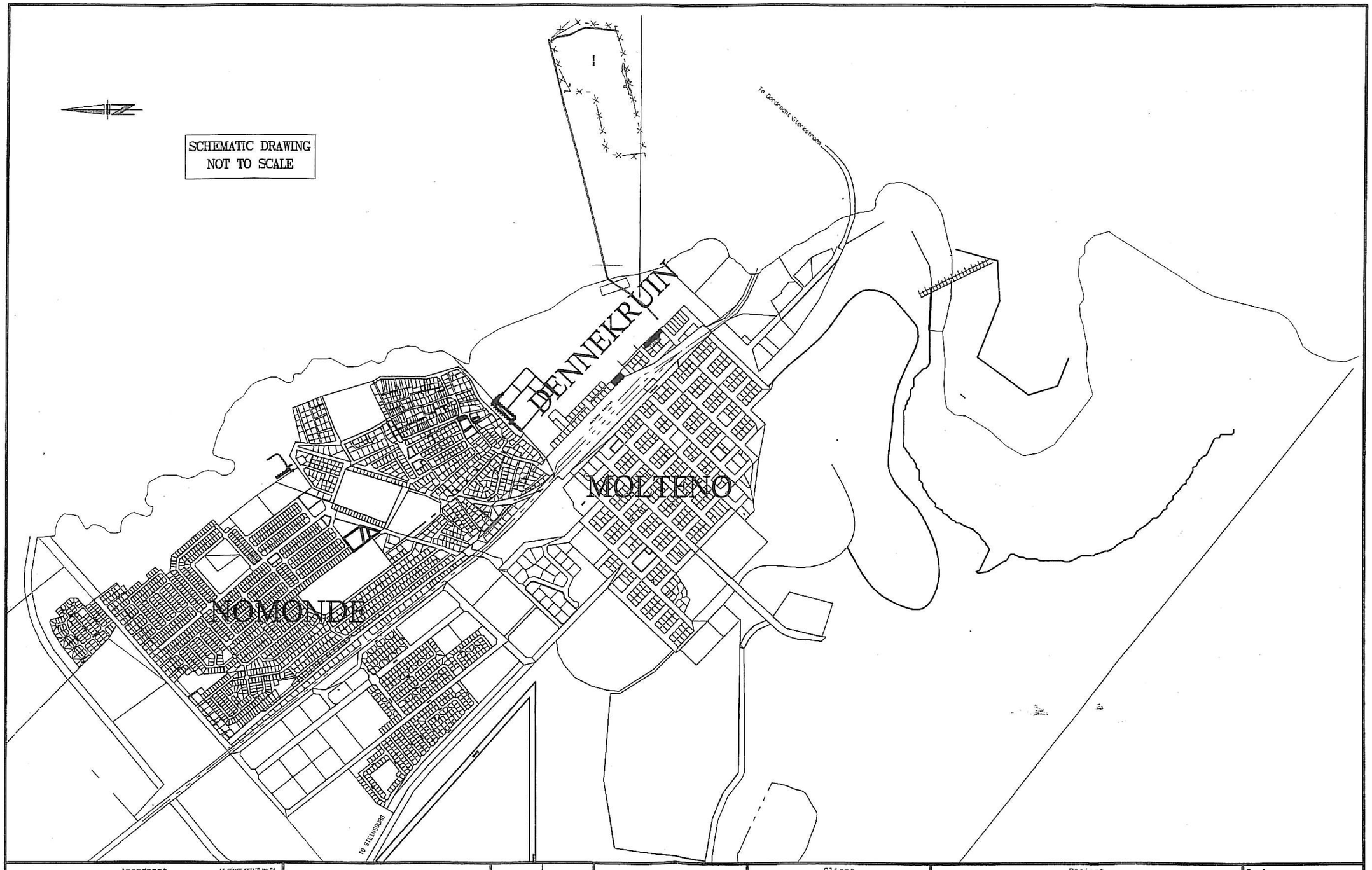
INKWANCA:
WATER SERVICES DEVELOPMENT PLAN
STERKSTROOM LOCALITY PLAN

Scale	NTS
Date	NOVEMBER 2002
Drawing number	18505000/2

SCHEMATIC DRAWING
NOT TO SCALE



Amendment					LE GRANGE ESTATE No 24
No.	Date	Checked	Done by	Description	
A	DDMTHOO		NAME	DESCRIPTION	

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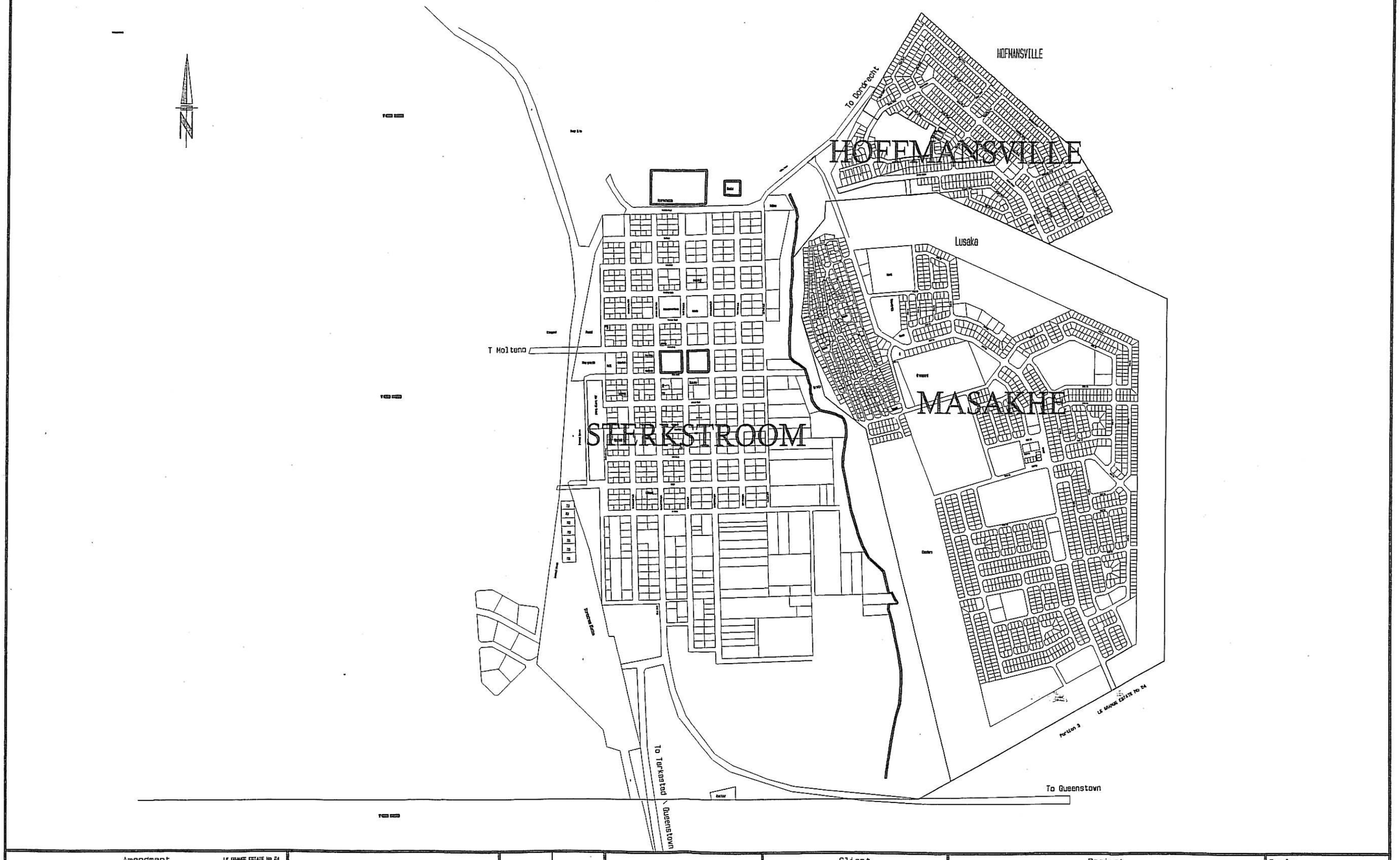
Project
INKWANCA: WATER SERVICES DEVELOPMENT PLAN

Drawing description
MOLTENO LAYOUT PLAN

Scale
NTS

Date
DECEMBER 2002

Drawing number
18505000/03



Amendment LE GRANGE ESTATE No 24				
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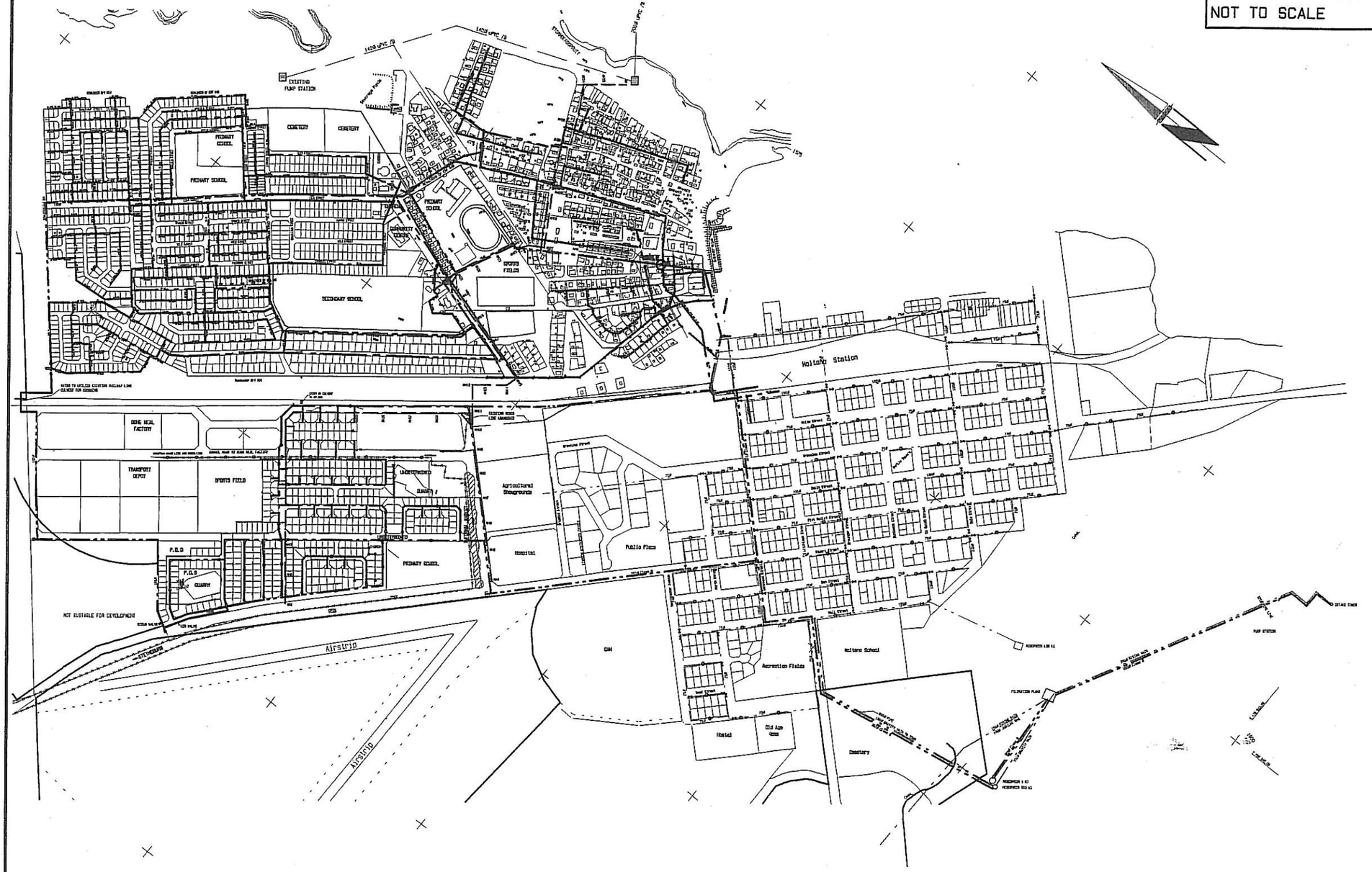
INKWANCA: WATER SERVICES DEVELOPMENT PLAN

Drawing description
STERKSTROOM LAYOUT PLAN

Scale: NTS
Date: DECEMBER 2002
Drawing number: 18505QO/04

SCHEMATIC DRAWING
NOT TO SCALE



Notes/Notes

LEGEND

EXISTING:

- SEWER LINE
- SEWER MANHOLE
- WATERMAIN

PROPOSED:

- SEWER LINE
- SEWER MANHOLE
- WATERMAIN
- DIDCAP

Amendment/Wysiging

No. Nr.	Date Datum	Checked Nagesien	Description Beskrywing

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Drawn Getekan	LR	Checked Nagesien	

Pr. Eng. Pr. Ing.

Consulting Eng. /Raadgewende Ing. Date/Datum

Client/Kliënt Date/Datum

Client/Kliënt

INKWANCA MUNICIPALITY

Project/Projek

INKWANCA: WATER SERVICES DEVELOPMENT PLAN

Plan Description/Planbeskrywing

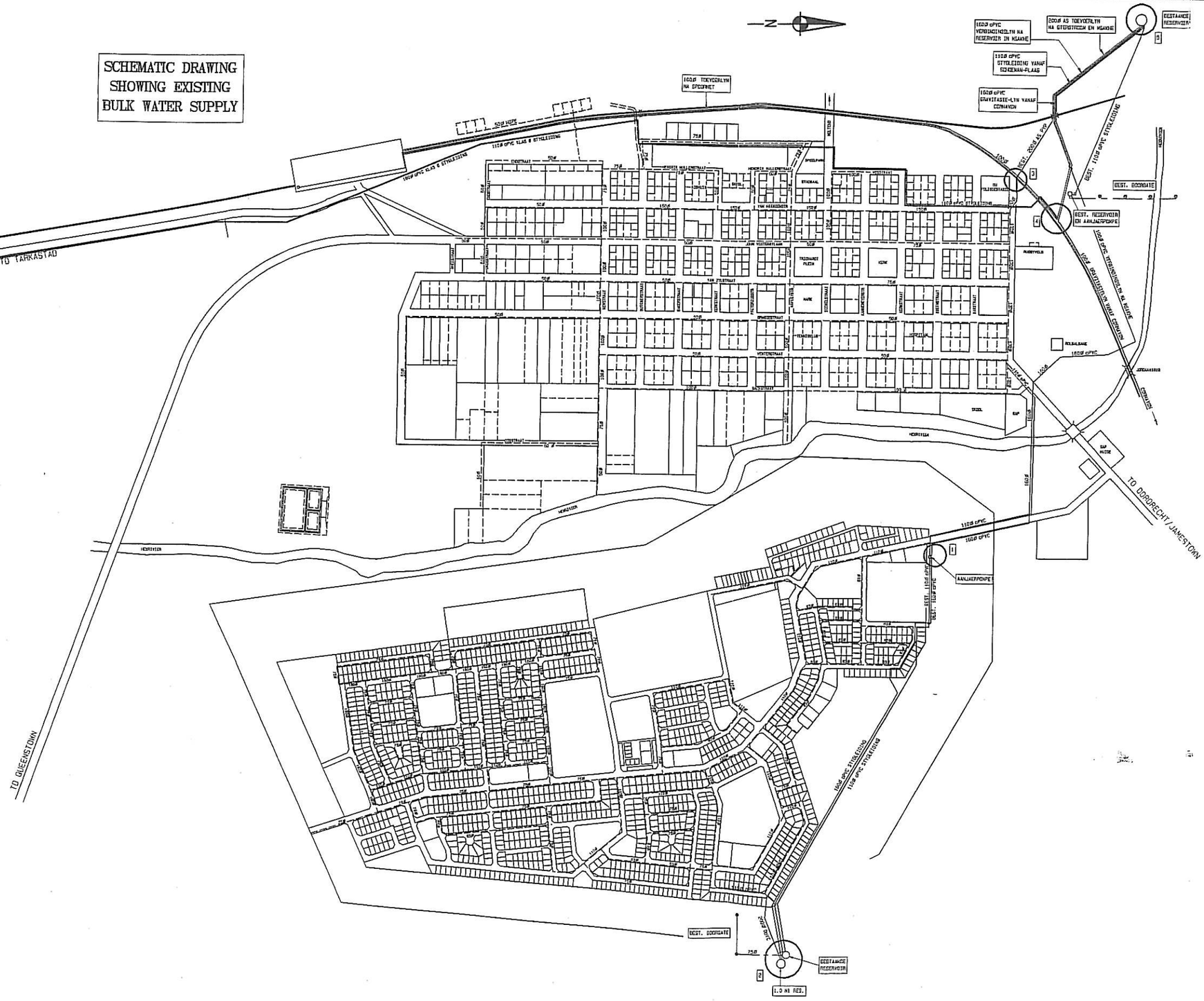
BULK SERVICES LAYOUT IN MOLTENO

Scale/Skaal	Date/Datum
N.T.S.	DECEMBER 2002

Plan No.

18505000/05

SCHEMATIC DRAWING SHOWING EXISTING BULK WATER SUPPLY



NOTAS

LEGENDE

MASSA WATERVOORSIENINGSPYPE

WATERNETWERK PYPE

[1] NODES I STEM PLAN NR. 484/259)

WYSIGINGS

BESKRYWING

KLIENT

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Bethlehem 9700
REG. NR. 93/04449/07
BETHLEHEM TEL.: (058) 3036646
GRAAFF-REINET TEL.: (0491) 25804
PRETORIA TEL.: (012) 8070155
NELSPRUIT TEL.: (013) 7449276

DIENS

INKWANCA : WATER SERVICES DEVELOPMENT PLAN

TEK BESKRYWING

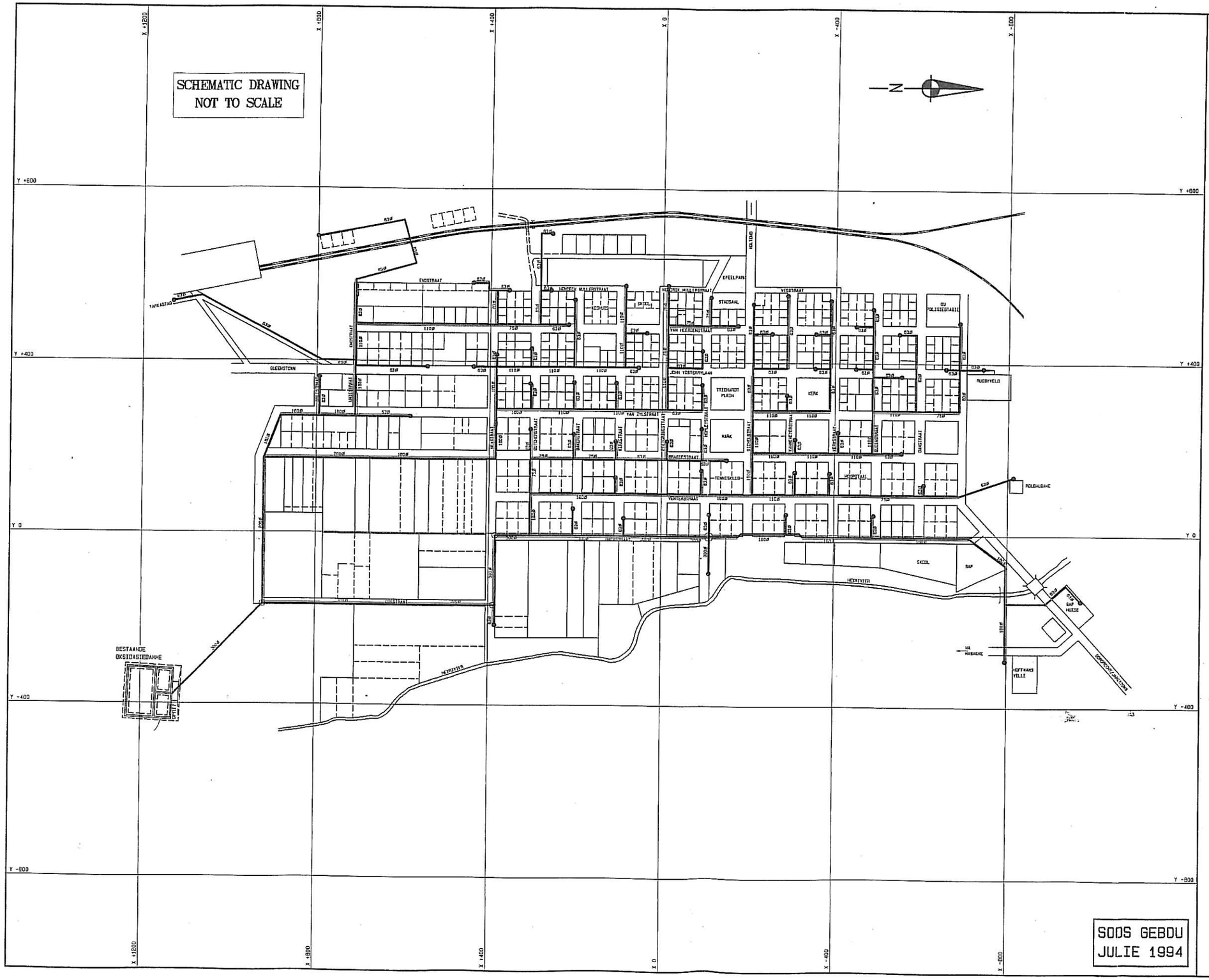
GENERAL LAYOUT : BULK WATER SUPPLY

TEK NR.

18505000/06

SKAAL NTS	GETEKEN	PK
DATUM DECEMBER 2002	ONTWERP	PK
	RAADG. ING.	

SCHEMATIC DRAWING
NOT TO SCALE



SODS GEBOU
JULIE 1994

NOTAS

LEGENDE
- oPVC KLAS 4 OP SYPAADJIE
- SKOONWAAKPUNT
- NANGAT
- oPVC KLAS 4 IN PAD
  (1 TOT 2m VANAF RANDSTEEN)

WYSIGINGS

BESKRYWING		

STERKSTROOM MUNISIPALE RAAD

LAUBSCHER HUMAN & LOMBARD
INGELYF/INCORPORATED
Reg. No. 80/04654/21
RAADGEWENDE INGENIEURS
CONSULTING ENGINEERS
PRETORIA TEL: 8070155 (012)
NELSPRUIT TEL: 52808 (01311
BETHLEHEM TEL: 30646 (01431)

DIENS
INKWACA : WATER SERVICES DEVELOPMENT PLAN

TITEL
GENERAL LAYOUT : BULK SEWERAGE

TEKENING NO.
18505000/07

SKAAL	GETEKEN
N.T.S.	PK
DATUM	RAADG. ING.
DECEMBER 2002	

SCHEMATIC DRAWING
NOT TO SCALE

EXISTING DAM

HEX RIVIER

OLD MASAKHE
SEE DRW 5415/306

1000ø UPVC CLASS STEEL REINFORCING

PUMPSTATION

AS BUILT

AMENDMENTS

DESCRIPTION

CLIENT

INKWANCA
LOCAL MUNICIPALITY

LHL
Consulting Engineers
LHL CONSULTING ENGINEERS (PTY) LTD
President Basheff Street 11 PO Box 1164
Bethlehem 9700
REG. NR. 93/04449/07
BETHLEHEM TEL.: (058) 3036646
GRAAFF-REINET TEL.: (0491) 25804
PRETORIA TEL.: (012) 6070155
NELSPRUIT TEL.: (013) 7449276

SERVICE

INKWANCA : WATER
SERVICES DEVELOPMENT PLAN

NETWORK LAYOUT

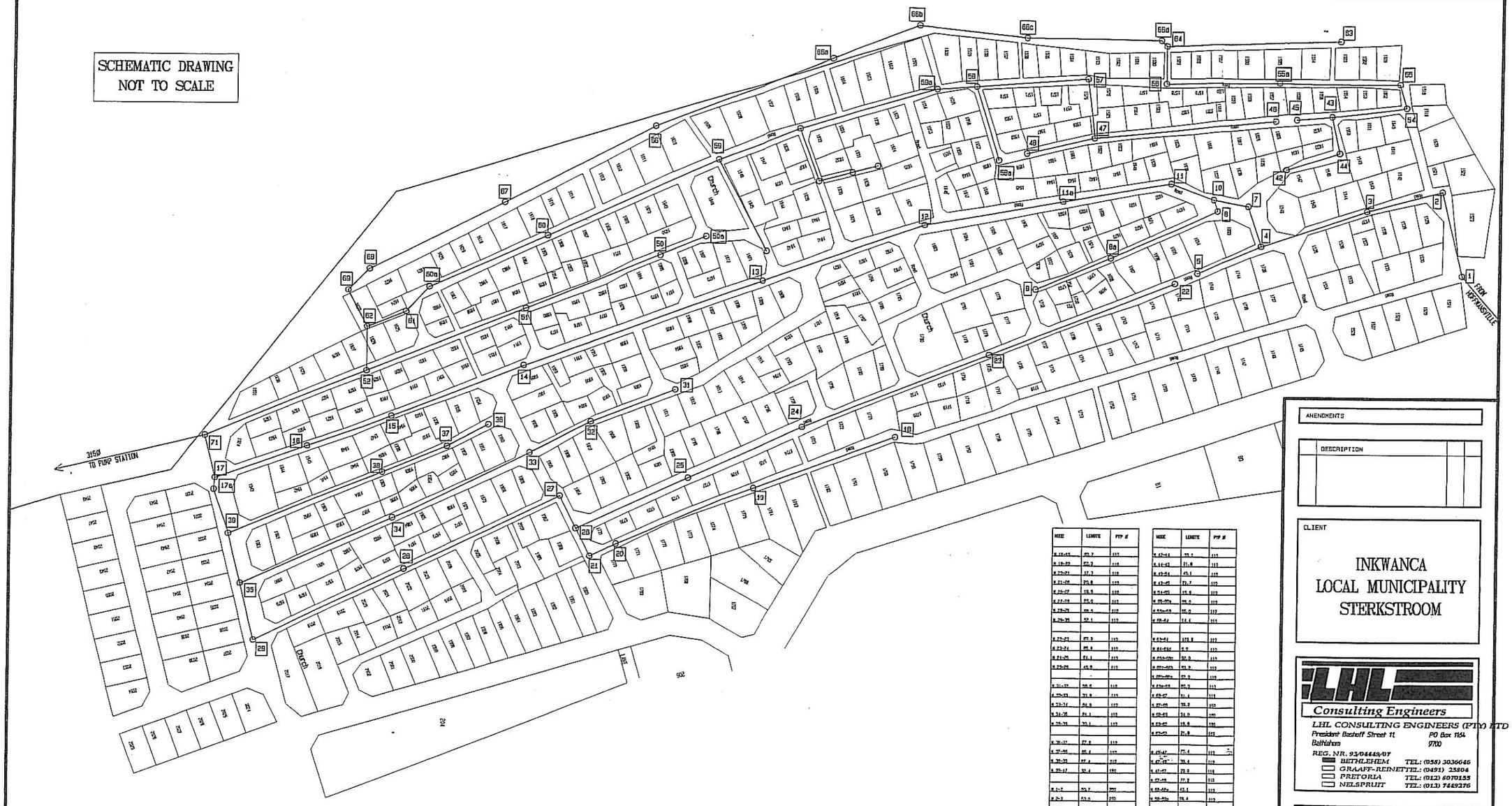
MASAKHE SIMPLIFIED SEWERAGE

DRW. NO

18505000/08

SCALE	DRAWN	IL
N.T.S.	DESIGNED	PK
DATE	CIVIL. ENG	
DECEMBER 2002		

SCHEMATIC DRAWING
NOT TO SCALE



NODE	LENGTH	PIPE Ø
M 18-19	89.7	110
M 19-20	82.3	110
M 20-21	37.3	110
M 21-28	70.8	110
M 28-27	15.5	110
M 27-26	85.0	110
M 26-25	89.5	110
M 25-24	92.1	110
M 24-23	87.3	110
M 23-24	85.8	110
M 24-25	81.1	110
M 25-26	45.8	110
M 31-32	98.6	110
M 32-33	91.8	110
M 33-34	84.3	110
M 34-35	91.1	110
M 35-36	93.1	110
M 36-37	87.8	110
M 37-38	85.4	110
M 38-39	87.4	110
M 39-17	30.4	160
M 1-2	93.7	250
M 2-3	93.4	250
M 3-4	93.8	250
M 4-5	71.8	250
M 6-7	73.1	250
M 7-10	21.5	250
M 10-8	7.8	110
M 8-9A	85.9	110
M 9A-9	88.9	110
M 10-11	34.8	250
M 11-11A	87.0	250
M 11A-12	87.8	250
M 12-13	91.9	250
M 13-14	91.8	250
M 14-15	91.7	250
M 15-16	88.6	250
M 16-17	88.7	250
M 17-71	26.7	250
M 57A-57	77.8	110
M 55-54	69.5	110
M 54-52	87.3	110
M 47-46	88.7	110

NODE	LENGTH	PIPE Ø
M 47-44	93.7	110
M 44-43	21.8	110
M 43-54	45.1	110
M 43-45	21.7	110
M 54-45	19.8	110
M 45-47A	88.0	110
M 47A-48	85.0	110
M 48-49	86.6	110
M 49-51	103.8	110
M 51-52	8.9	110
M 52A-47A	92.8	110
M 47A-47B	93.9	110
M 47B-48A	87.9	110
M 48A-48	85.9	110
M 48-47	91.1	110
M 47-46	98.2	160
M 46-45	94.9	160
M 45-42	95.8	160
M 47-42	21.8	160
M 45-42	77.4	110
M 47-48	78.4	110
M 47-47	73.8	110
M 47-46	77.2	110
M 52-52A	43.1	110
M 52-52B	78.4	110
M 52A-47	87.8	110
M 47-47A	21.8	110
M 52A-52	95.0	110
M 47A-51	98.2	110
M 51-52	73.2	110

AS BUILT

AMENDMENTS

DESCRIPTION			

CLIENT

INKWANCA
LOCAL MUNICIPALITY
STERKSTROOM

LHL Consulting Engineers
LHL CONSULTING ENGINEERS (PTY) LTD
President Basheff Street 11 — PO Box 1154
Bethlehem — 9700
REG. NR. 92/04449/07
BETHLEHEM TEL.: (058) 3036646
GRAAFF-REINET TEL.: (0491) 25804
PRETORIA TEL.: (012) 6070155
NELSPRUIT TEL.: (013) 7449276

SERVICE

INKWANCA : WATER
SERVICES DEVELOPMENT PLAN

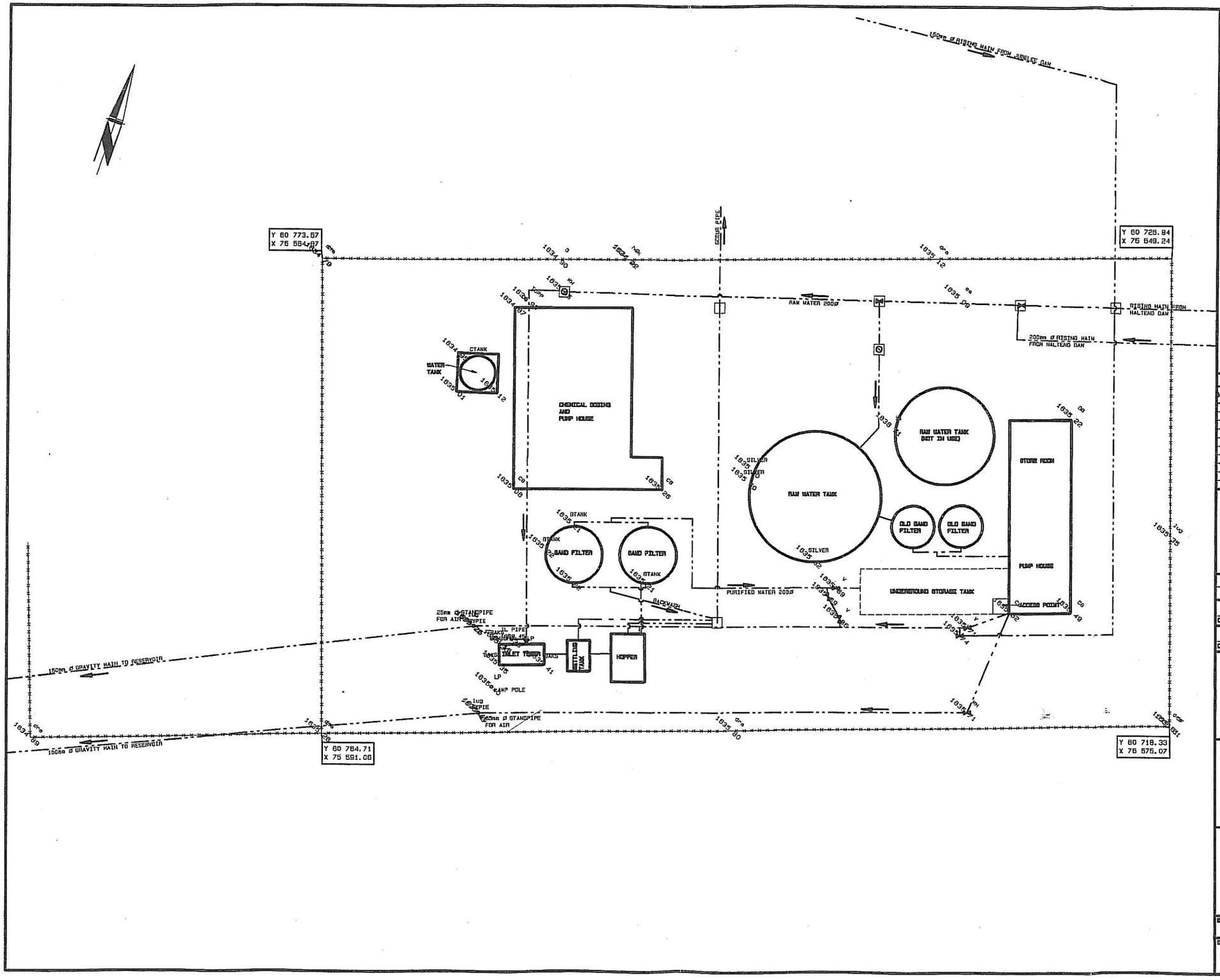
NETWORK LAYOUT

OLD MASAKHE
SEWERAGE NETWORK LAYOUT

DRW. NO

18505000/09

SCALE	DRAWN	IL
N.T.S.	DESIGNED	PK
DATE	CIVIL. ENG	
DECEMBER 2002		



SCALE FOR REDUCED PLAN
0 10 20 30 40 50
50cm ON ORIGINAL DRAWING

Notes

- VALVE
- FLOW METER

Amendment

No.	Date	Checked	Done by	Description

KWEZI V3 ENGINEERS
P.O. Box 7587
Newton Park 6055
Tel: (041) 391-6911
Fax: (041) 364-0788
e-mail: portelizabeth@v3.co.za

Designed	Drawn	Checked
WT	ES	

Consulting Engineer — Date

Client — Date

Client

INKWANCA MUNICIPALITY

Project

INKWANCA : WATER SERVICES DEVELOPMENT PLAN

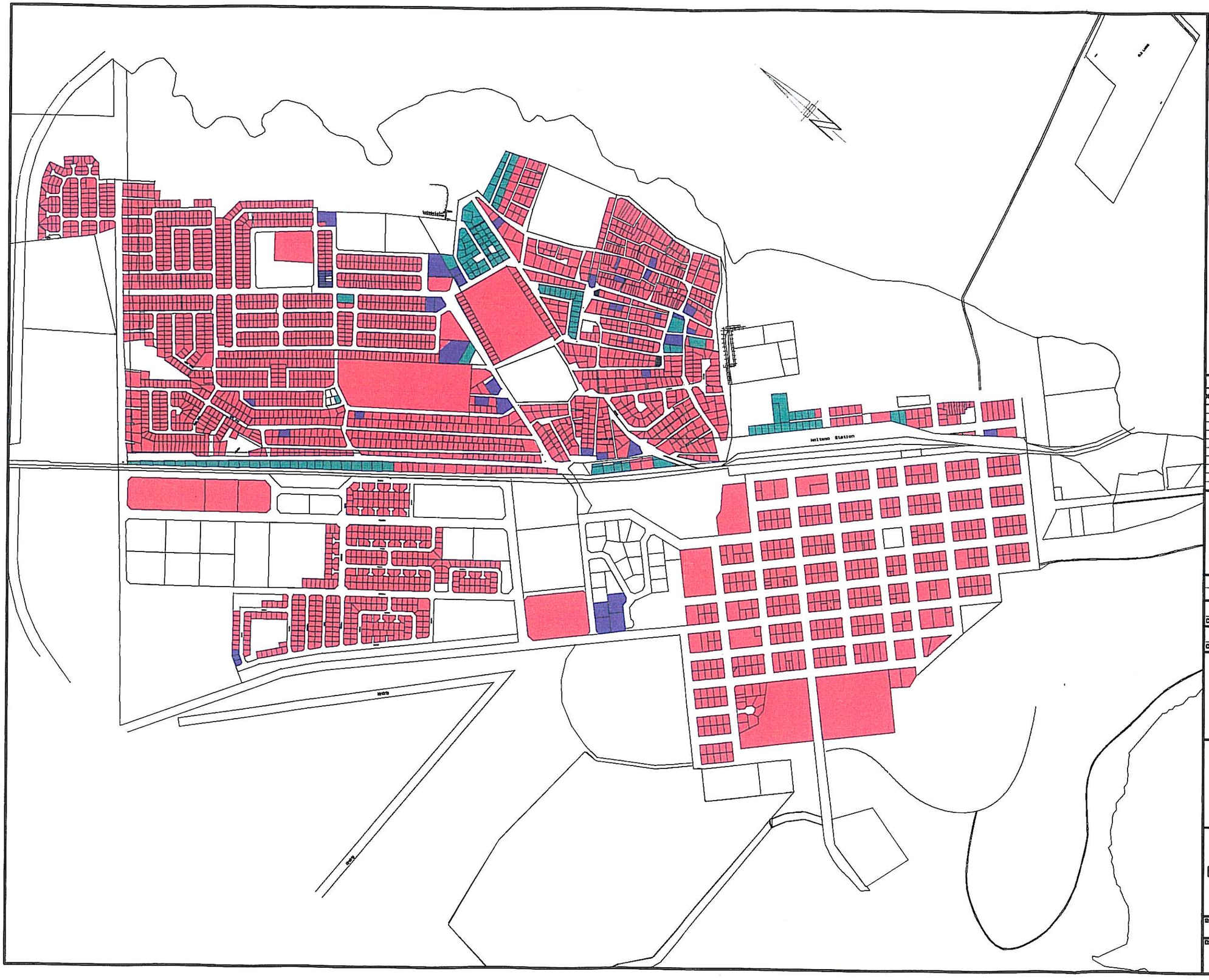
Drawing description

SITE LAYOUT : WATER TREATMENT PLANT IN MOLTENO

Scale	Date
NTS	DECEMBER 2002

Drawing number

16505000/10



SCALE FOR REDUCED PLAN
0 10 20 30 40 50
50cm ON ORIGINAL DRAWING

Notes

LEGEND:

- None or Inadequate
- None or Inadequate (bucket)
- Consumer Installation (Septic Tanks)
- Discharge to waterworks (Intermediate or full waterborne)

Amendment

No.	Date	Checked	Done by	Description
			NAME	DESCRIPTION
4	DDMTHCC			

KWEZI V3 ENGINEERS
P.O.Box 7887
Newton Park 6055
Tel: (041) 391-6811
Fax: (041) 364-2760
e-mail: portelizabeth@v3.co.za

Designed	Drawn	Checked
NAME	NAME	

Consulting Engineer — Date

Client — Date

Client

INKWANCA MUNICIPALITY
P. O. Box 1
MOLTENO
5500
TEL: (043) 997 0021
FAX: (043) 9970457
E-MAIL: noubs@molteno.gov.za

Project

INKWANCA: WATER SERVICES DEVELOPMENT PLAN

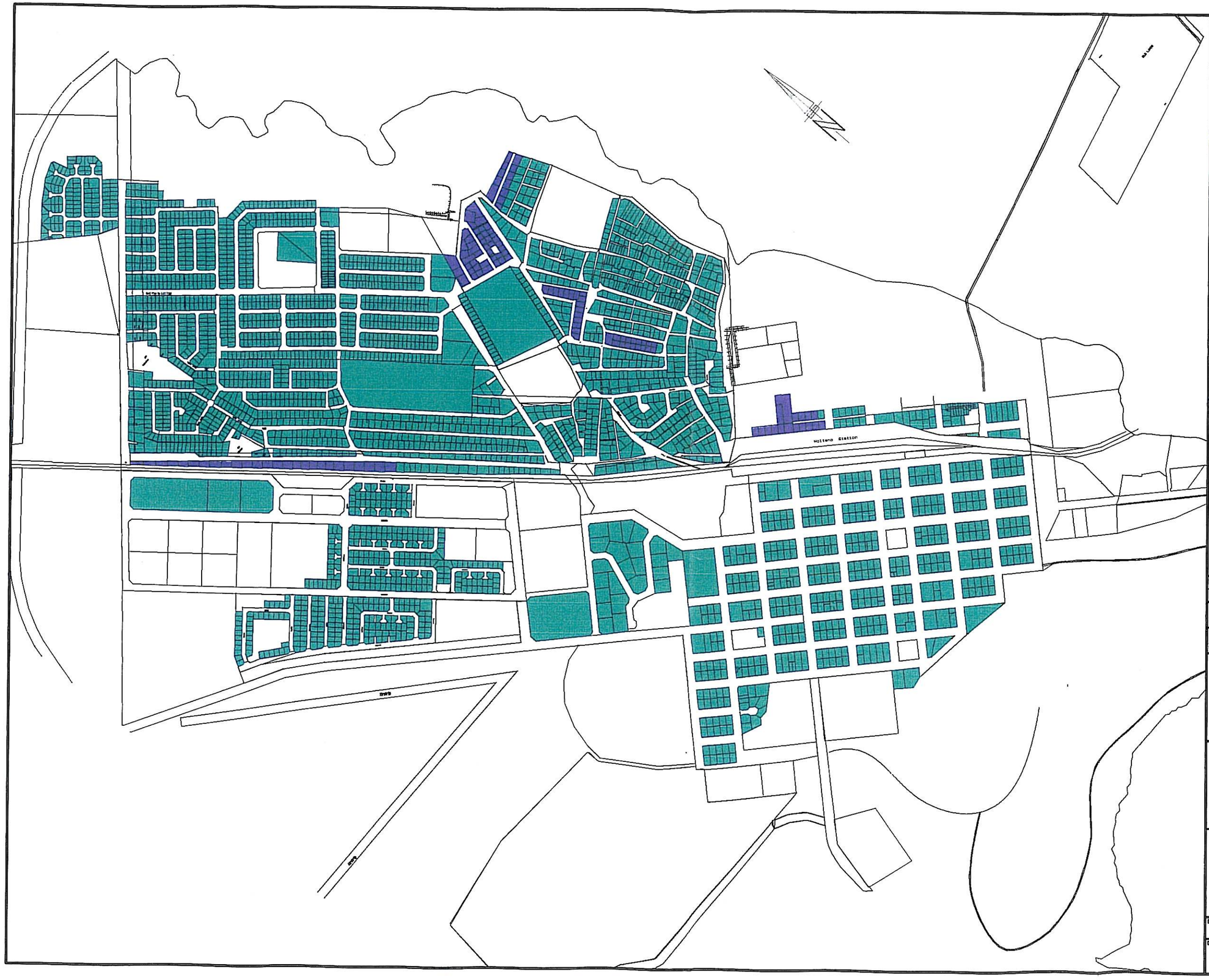
Drawing description

MOLTENO EXISTING LAND USE SANITATION

Scale	Date
NTS	DEC. 2002

Drawing number

18505000/11



SCALE FOR REDUCED PLAN
0 10 20 30 40 50
80mm ON ORIGINAL DRAWING

Notes

LEGEND:

- None or Inadequate
- Communal water supply
- Controlled volume supply
- Uncontrolled volume supply

Amendment

No.	Date	Checked	Done by	Description
A	COMMENTS		NAME	DESCRIPTION

KWEZI V3 ENGINEERS
P.O. Box 7897
Newton Park 6055
Tel: (041) 391-4911
Fax: (041) 364-3788
e-mail: portelizabeth@v3.co.za

Designed	Drawn	Checked
NAME	NAME	

Consulting Engineer Date

Client Date

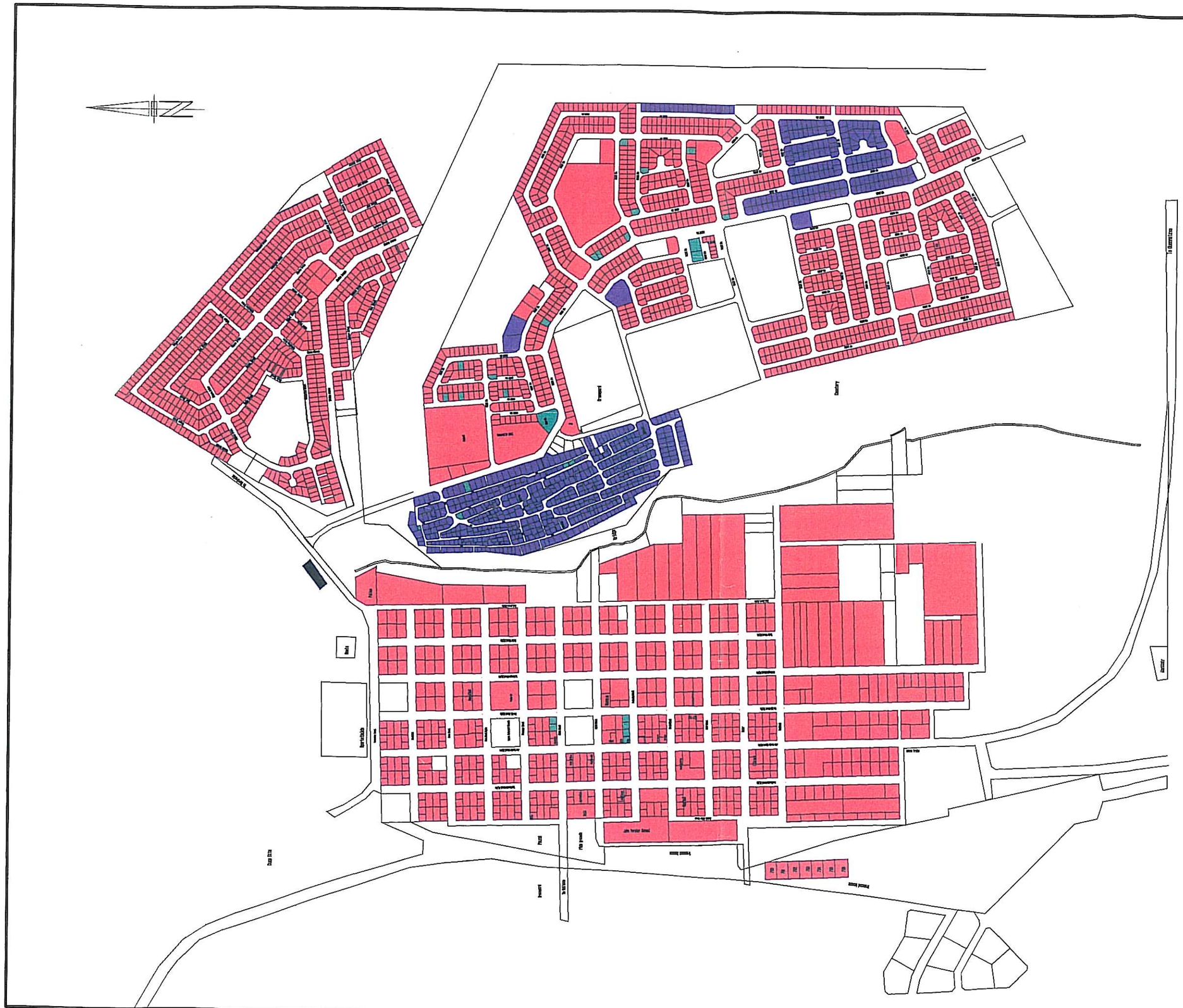
Client
INKWANCA MUNICIPALITY
P. O. Box 1
MOLTENO
5500
TEL: (045) 967 0021
FAX: (045) 9670457
E-MAIL: noubes@molteno.gov.za

Project
INKWANCA:
WATER SERVICES
DEVELOPMENT PLAN

Drawing description
MOLTENO
EXISTING LAND USE
WATER SUPPLY

Scale	Date
NTS	DEC. 2002

Drawing number
18505000/13



SCALE FOR REDUCED PLAN
0 10 20 30 40 50
150mm ON ORIGINAL DRAWING

Notes

LEGEND:

- None or Inadequate
- None or Inadequate (bucket)
- Consumer Installation (Septic Tanks)
- Discharge to waterworks (Intermediate or full waterborne)

Amendment

No.	Date	Checked	Done by	Description
A	00/11/00		ITANE	DESCRIPTION

KWEZI V3 ENGINEERS
P.O.Box 7587
Newton Park 6055
Tel: (041) 391-0811
Fax: (041) 364-3798
e-mail: portelizabeth@v3.co.za

Designed	Drawn	Checked
NAME	NAME	

Consulting Engineer ---------- Date

Client ---------- Date

Client
INKWANCA MUNICIPALITY
P. O. Box 1
MOLTENO
5500
TEL: (045) 887 0021
FAX: (045) 9870487
E-MAIL: ncube@molteno.gov.za

Project
INKWANCA: WATER SERVICES DEVELOPMENT PLAN

Drawing description
STERKSTROOM EXISTING LAND USE: SANITATION

Scale	Date
NTS	DEC. 2002

Drawing number
18505000/14

INKWANGA MUNICIPALITY

ORGANISATIONAL STRUCTURE