

RECONSTRUCTION AND DEVELOPMENT
WATER SUPPLY AND SANITATION PROGRAMME

**BHEKUMTHETHO WATER SUPPLY
BUSINESS PLAN**

PROVINCE : Kwa- Zulu Natal

PROGRAMME : Round 4

PROJECT NUMBER : KN 124

PROJECT NAME : Bhekumthetho Water Supply

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ABBREVIATIONS

BP	Business Plan
CBC	Community Based Contractor
CMIP	Municipal Infrastructure Programme
DWAf	Department of Water Affairs and Forestry
IA	Implementing Agent
ISD	Institutional and Social Development
KPI	Key Performance Indicator
LA	Local Authority
LG	Local Government
LWC	Local Water Committee
O&M	Operation and Maintenance
PDI	Previously Disadvantaged Individual
PDC	Previously Disadvantaged Company
PSC	Project Steering Committee
RC	Regional Council (KwaZulu Natal)
RDP	Reconstruction and Development Programme
SAACE	South African Association of Consulting Engineers
TLC	Transitional Local Council
TRC	Transitional Rural Council
WSA	Water Services Authority
WSP	Water Services Provider

EXECUTIVE SUMMARY

BHEKUMTHETHO WATER SUPPLY PROJECT : KN 124

1. PROJECT INFORMATION

Project name and number:

Bhekumthetho Water Project (KN 124).

Locality:

The project is located approximately 25 km south west of the town of Vryheid in the Abaqiusi Local Municipality area. The area is approximately 21 km².

Population:

The estimated population residing in the Bhekumthetho area is 8 200 people, approximately 887 homesteads. The estimated population that will benefit from this planned water scheme (bulk water supply and reticulation) will be 8 200 people, approximately 887 homesteads. The estimated water demand is 123 kℓ/d @ 15 ℓ/p/d initially, growing to 205 kℓ/d @ 25 ℓ/p/d in ten years time. (Refer to Par. 2.2.1.1 for more detail).

Tribal Authority:

Othaka Tribal Authority

Magisterial district:

Vryheid

District Municipality:

Zululand District Municipality DC 26

Local Municipality:

Abaqualusi Municipality KZ 263

Implementing agent:

Zululand District Municipality DC 26

2. PROJECT OBJECTIVES

The project objectives are as follows:

- To develop an integrated “**turn around**” ISD Plan that will ensure a fully **operational** and **sustainable** scheme.
- To provide the community with **adequate, safe, reliable** and **sustainable** water service to RDP Standards resulting in an improved quality of life.
- To **improve** the **sanitation** situation in the area.
- To create a **financially feasible** project with **affordable tariffs**, with appropriate accounting systems.
- To create local **job opportunities** during the implementation phase and during the operation and **maintenance phase**.
- To build capacity and empower the local community in taking charge of their own affairs, through sound and accountable **institutional structures**.
- To **establish** and **promote** good, **accountable governance** along national guidelines;
- To build **awareness** for the **environment** and the **value of water** as a scarce resource.

3. COMMUNITY NEEDS

The needs of the community can be summarized as follows:

- An urgent need for safe potable water, considering the poor state of existing water sources.
- Job opportunities.
- Economic empowerment.
- Institutional empowerment.

4. A BRIEF OVERVIEW OF PLANNED SCOPE OF WORK

It is proposed that water be obtained from the existing eMondlo water works and reticulated to the existing and proposed reservoirs at Bhekumthetho. The reticulation would then be extended from these reservoirs. The planned scope of work will consist of the following:

- Construction of bulk water supply and reticulation
 - * Connection at existing eMondlo water works
 - * Gravity fed bulk supply line to Bhekumthetho
 - * 1 x 225kℓ reservoir
 - * The extension of existing reticulation system
 - * Repair and upgrading of existing borehole pump stations
 - * Spring protection
 - * Payment office
- A complete ISD exercise for the project along the DWAF Guidelines.
- A one-year operation, maintenance and mentoring period.
- Transfer of project to the WSA.

5. SUSTAINABILITY INDICATORS

The factors influencing the sustainability of the project is favourable and are summarised as follows:

- The whole of the Bhekumthetho community has demonstrated their absolute dismay with the current standard of water supply to their community stating "We have suffered enough" and they are anxious about this proposed funding.
- With reference to Bhekumthetho Clinic, the KwaZulu Department of Health has forwarded a letter in which they made a conclusion statement that **"Any primary care facility needs a reliable source of drinking water to operate. This facility often experiences a water shortage and this has become the norm now. This is not acceptable and needs to be addressed as a matter of urgency."**
- During the ISD Consultation done in the community, a 95% vote indicated that they would pay for their own metered yard connections. This indicates that the anticipated cost recovery will have a high success rate.
- **An independent geohydrological investigation has indicated that the supply yields from water sources in the Bhekumthetho area is sustainable.**
- **The bulk source of water from the Mondlo water works will supply clean and sustainable water to Bhekumthetho. The Mondlo Water Works does have the additional capacity of 0.796Mℓ per day to supply a maximum required volume of 0.15 Mℓ per day to Bhekumthetho. The 0.796 Mℓ surplus capacity is based statistics over the last 8 months.**

6. SANITATION

The installation of the project will improve the sanitation situation in the area due to the availability of clean, potable water. During the project, a sanitation awareness programme will be undertaken as part of the ISD work. The area is densely populated and the expected increase in wastewater due to the increased availability of water will have an effect on the area. No ill effects are expected as most households have already built their own pit type toilets. During 2001/2002 the Abaqulusi Municipality area registered a number of cholera cases with most coming from the Mondlo / Bhekumthetho area. This occurred mostly due to the fact that clean drinking water was not available.

7. PROPOSED OPERATION AND MAINTENANCE MODEL

The level of service implemented during the previous two construction phases was metered yard connections. Subsequently this means of cost recovery collapsed due to the shortfall of sustainable water, inadequate external ongoing support and interference from the Local Traditional Authority. Consumers stopped paying because they did not get adequate service as a result of the above mentioned problem areas. In order to develop a "turn around" plan for this scheme the following Operation and Maintenance module will be implemented:

1. All existing consumers must be upgraded to metered household connections, funded by Zululand District Municipality.
2. All existing consumers must be re-registered.
3. New consumers will be serviced with metered households (DWAF will not have to fund this).
4. All new consumers will be registered.
5. A scheme management plan will be finalised that will put permanent Operation and Maintenance staff in place to ensure discipline actions in case of non payments or faults.

The Operation and Maintenance module has been carefully developed with the Bhukumthetho community. Cost recovery on a flat rate system with a community standpipe system as level of service holds a too big a risk as a monthly billing will be forth coming from the Mondlo Water Works. A culture of non-payment, as is the case with their neighbours in Mondlo Town may develop, resulting in the disconnection of supply from the Mondlo Water Works. Through a dedicated ISD programme a local sub WSP will be put in place. This conforms to the Option 2 as per the DWAF guidelines. The Water Services Authority is the Zululand District Municipality.

The Operation and Maintenance Model has been calculated using the expected actual costs and water consumption and is the estimated costs to the WSA over five years are summarised below.

R26 868 (Operating Deficit : Year 1)	+	R38 400 (WSA support)	=	R65 268
R15 057 (Operating Deficit : Year 2)	+	R41 472 (WSA support)	=	R56 529
R2 108 (Operating Deficit : Year 3)	+	R44 790 (WSA support)	=	R46 898
R0 (Operating Deficit : Year 4)	+	R48 373 (WSA support)	=	R48 373
R0 (Operating Deficit : Year 5)	+	R52 243 (WSA support)	=	R52 243
R44 033 (Operating Deficit : Total)	+	R225 278 (WSA support)	=	R269 311

8. TRANSFER

Once the project has been practical completed, a one-year O&M mentoring period will commence during which the necessary WSA and WSP agreements will be put in place. During this time it will be ensured that all the management systems are in place, working satisfactory and standard KPI's are met. Transfer of the Water Project from the Department of Water Affairs and Forestry to the WSA will take place one year after practical completion.

9. COST ESTIMATE

The estimated project costs are summarized as follows: (Please refer to Annexure A)

NO	ITEM	BUDGET
1	Estimated Construction Cost (Total Capital Cost)	R 2 233 484.20
2	Business Plan Fees	R 79 230
3	Implementing Agent Fees	R 61 270
4	Capacity Building and Training	R 191 496
5	Professional Fees	R 337 187.79
6	Operation and Maintenance	R 30 000
7	Technical Training and Supervision	R 76 588
8	Community Representative Reimbursements	R 10 944
9	Mentoring, Ongoing Monitoring and Evaluation	R 79 800
	TOTAL ESTIMATED BUDGET (incl. VAT)	R 3 100 000

Population served : 8 200

Project cost per capita : R 378.05 (incl. VAT)

10. PROGRAMME

B.P. submission	February 2002
B.P. approval	May 2002
Design and initial ISD phase	December 2001 to February 2002
Construction phase	May 2002 to September 2002
Practical Completion and Commissioning	October 2002
Mentor period	October 2002 to July 2003
Transfer	July 2003

11. RECOMMENDATION

DWAF will be responsible for financing the project from project identification to transfer, for the amount of R3 100 000.00 (see Annexure A). Zululand District Municipality will be responsible for the O & M budget to operate the scheme after practical completion. During the first five years, this estimated cost is R269 311.00. It is estimated that the project (WSP) will be sustainable after three years. The WSA support services (SSA) will have to be subsidised by the Equitable Share. Zululand District Municipality as Water Service Authority will be responsible for all deficits that occur on the scheme.

Zululand District Municipality will implement a contract between themselves and the Bhekumthetho Water Service Provider (As per the draft in Annexure I). This would enable Zululand District Municipality to recover cost and assist the Bhekumthetho Water Service Provider to operate, maintain and monitor the scheme.

The Bhekumthetho Water Service Provider will need to employ two maintenance officers and one clerk to operate and maintain the scheme. The projected annual cost to operate the scheme after year five will be R215 996.00 per year. The projected income from water sales (If 85 % of the consumers pay for services and 870 household connections are installed) will be R239 598.00 per year.

1. INTRODUCTION

1.1 Project Title

Bhekumthetho Water Supply Project.

1.2 Project Name

Project Number	Project Name	District and Local Councils	Project Type	Budget
KN 124	Bhekumthetho Water Project	Zululand District Municipality Abaqulusi Municipality	Community Water Supply Scheme	R3 100 000.00

1.3 Project Location

Bhekumthetho is situated about 25km south west of Vryheid and to the north of eMondlo. Please also refer to the attached locality map – Annexure K. The co-ordinates are:

27° 58' 15" South 30° 43' 30" East

1.4 Purpose of the Business Plan

The purpose of the Business Plan is to :

- * describe a strategic program based approach to potable water service delivery for the residents of the Bhekumthetho Water Project and;
- * Access funds on behalf of the Bhekumthetho Project Steering Committee from the Department's funds

by:

- * Supplying details of the program and the project;
- * Demonstrating how they will conform to RDP / DWAF requirements;
- * Describing how they will be implemented and managed;
- * Discussing strategies for funding and sustainability; and
- * Showing how progress will be measured against goals specified in the Business Plan.

1.5 Project Objectives

1.5.1 To provide an adequate and potable supply of water

To provide an adequate long-term supply of potable water within 200m of each dwelling to this community of approximately 8 200 people.
Currently adequate water is not available, especially during the dry season when non-perennial streams and boreholes are dry.

1.5.2 To achieve institutional sustainability

The PSC will manage the implementation of the scheme during construction and up to commissioning.
The PSC will be abolished and replaced with the Water Service Provider after commissioning of the scheme. The tribal and community structures will be acknowledged within the PSC and WSP.
The WSA will be the owner of the scheme, with the WSP responsible for operating and maintaining the scheme. The WSP will enter into a contractual agreement with the WSA.

1.5.3 To achieve cost recovery

The WSA will formulate and set the local water tariff. Bylaws relevant to cost recovery, tariff structure and unauthorised connections will be set by the WSA in consultation with the WSP during the construction period. The tariffs will be in accordance with the Water Services Act of 1997 taking the free water issue into account. Deficits will be funded by the WSA (from their own funding).

The level of service will be metered household connections. It is a well-known fact that DWAF does not fund the provision of metered household connections. However previous water projects in the community operate through metered household connections and the community has indicated that this project must meet-up with the level of service provided to the other members in their community as "*they are all equal*". Due to the fact that DWAF does not fund the acquired level of service, an alternative approach had to be developed. The following model was then developed in consultation with the community:

- They agreed that each household would pay for their metered yard connection.
- To enable the poor in the community to afford a metered yard connection the project will be divided into two main construction components e.g.
 - ♦ Specialised Work done by a contractor appointed through the award of a tender &
 - ♦ Labour based construction, where the PSC will form a Labour Desk who will under take the trenching, pipelaying & backfilling as a “*Local Sub Contractor*”, employing only local people, and submitting claims, certified by the engineer to the Implementing agent for payment.
- The amount available in the budget for labour is R302 250.00. Construction of the pipelines will take two (2) months should 90 people be employed on a task basis. A minimum of 180 labourers will thus earn between R500.00 and R800.00 per month depending on his/her productivity. This would be an additional income placing the poorest of the poor in the community in a position to pay for their metered yard connection.
- Payment could be made by a R20.00 - R50.00 monthly instalment should some households still not be able to afford the yard connection. Through a special arrangement with the WSP & WSA these people would not be denied access to water, and a metered yard connection will be made available to these individuals as long as they contribute towards the monthly instalment.

1.5.4 To achieve community participation and governance

The community will be represented by the PSC during construction stage and by the WSP after commissioning. The PSC will establish a local labour desk, who will employ members of the community during the construction stage of the scheme, to assist with labour intensive construction. The WSP, formed from members of the community and the tribal structure, will manage, maintain and operate the project after commissioning.

1.5.5 To promote hygiene, health and sanitation

The ISD consultant will implement a hygiene, health and sanitation programme during construction of the scheme.

1.6 Overview of Regional Planning / studies

The project is located within the Abaqulusi Local Municipality area of the Zululand District Municipality and the following regional planning and studies were done:

- The Zululand District Municipality has prepared and accepted an Integrated Development Plan.
- A Hydrocensus is currently being prepared concentrating on the water source (mostly ground water) as well as highlighting the areas with the most critical needs.
- A Water Services Development Plan (WSDP) is in process at present which will:
 - Determine the status of the customers within the region as well as the existing infrastructure.
 - Provide a planning tool to ensure the cost effective service planning and delivery throughout the region in the long term.
 - Provide guidelines for the formulation of local water tariffs.
 - Provide guidelines for bylaws for cost recovery.

The long term plan for the Bhukumthetho Water Project is within the Development Plan and will form part of the Water Services Development Plan in progress at present. SSA's will service the entire Zululand District Municipality and projects will be grouped together to enable the SSA's to service different projects on the same day. Grouped Projects will share SSA's cost such as:

- Purification
- Water testing
- Routine maintenance inspections
- Auditing etc.

1.7 Project Approval by the PSC

This Business Plan was signed by the authorised representative of the Bhukumthetho Project Steering Committee and nominated responsible members, including the Ward Councillor, Cllr J. Sibiya and DWAF representative, Mr Thulani Mnyandu. The Executive Committee of the WSA has also approved the Business Plan and is committed to take transfer and fund the deficits of this scheme. (See Annexure Q)

2. PROJECT DETAILS

2.1 Project Location

Project Number	Project Name	Nearest Town and distance to the village	Latitude	Longitude
KN 124	Bhekumthetho Water Supply	Vryheid – 25 km Mondlo - < 1 km	27° 58' 15" S	30° 43' 30" E

Ward Name	Population	Households	Current Level of Water Service
1 Zama	1 360	160	Fully serviced metered household connections
2 Phumeceleni	1 070	116	Partially serviced metered household connections
3 Maria	2 845	275	Fully serviced metered household connections
4 Zwelisha	1 580	183	Partially serviced metered household connections
5 Madresini	1 345	153	Partially serviced metered household connections
TOTAL	8 200	887	
OTHAKA TRIBAL AUTHORITY			

(See Annexure K for locality plan)

2.2 Present situation

2.2.1 Community Profile

2.2.1.1 Population figures including historic trends

In order to estimate the future population to be served by the scheme, two possible growth scenarios have been assumed, as there are no historical growth rate trends available.

The first scenario is a positive growth rate of 2% for the next ten years. This scenario is based on the historical growth rate observed within the rural areas in the Bhukumthetho district.

The second scenario assumed a growth rate of 0%. This scenario has been assumed as worst case scenario for determining the sustainability of a project due to a zero increase in the population. This scenario attempts to address the possible negative effects of HIV/AIDS, political unrest and economical depression. For the purpose of this Business Plan an annual growth rate of 0% was used.

The population figures and extent of services could be summarised as follows:

- Population

Bhekumthetho Community - 8 200 people
887 households

- Water Services (Reticulation)

Population served by Phase I & II - 4 765 people
507 households
Population served by new extension - 3 434 people
380 households

- Water Services (Bulk Supply from Mondlo Water Works)

The whole of Bhukumthetho will be supplied with bulk water from Mondlo Water Works. This includes the reticulation areas covered in Phase I and II as well as the new areas to be reticulated.

Population served by Phase I & II and the new extension - 8 200 people
887 households

For the purpose of this Business Plan the population to be served to RDP levels of service is taken as the whole community. (Source of data – Zululand WSDP Survey 2000-2001 with an accuracy margin of 10%)

2.2.1.2 Level of community awareness and development

The community of Bhukumthetho is well aware of the proposed refurbishment and extension of water supply services in their community. An ISD Consultant was appointed for the Business Plan Phase of this project to facilitate the community awareness programme. Mass community meetings were held at the Bhukumthetho Community Hall. The community seems to be very interested in these proposed developments, as they did not receive funding from the previous DWAF funding programme expected in April 1998.

2.2.1.3 Community structures, organisations and leadership profile

The main community structures are the Tribal Authority structures.

i) Tribal Authority

The Bhukumthetho community falls under the jurisdiction of the Othaka Tribal Authority. The ward is divided into five sub-wards (Refer to par 2.1). Each of these sub-wards is under the jurisdiction of an Inkosi who controls the use of tribal lands by charging levies from people in exchange for residence and grazing rights. This Tribal Authority System is functioning well within this community.

ii) Organisational Capacity

A Ward committee was formed using representatives from each of the sub-wards of Bhukumthetho. This organisational structure is functioning effectively and many development projects are now being implemented by this committee.

2.2.1.4 Level of involvement of women

The Tribal Authority is fast adapting to accommodate and acknowledge the role of women in the area. This traditionally male dominated region has accepted the government requirements pertaining to the involvement of women on water supply projects, and attempt to fulfil these requirements.

The PSC comprises of 62 % women representatives. Women hold 5 out 8 positions on the PSC.

This is evidence not only of the involvement of women in the project area, but also in the positive attitude of the project community to the participation of women, and women in leadership roles. However, the involvement of women is considered considerably less than that of men. Accordingly, women will be actively encouraged to continue their involvement in the project.

2.2.1.5 Income level and sources of income of the community

i) Income level

~~The average level of income varies between R200.00 to R450.00 per month. At~~
Bhukumthetho the average income per household per month is R360.00. The minimum income is R200.00 / month. This information is 80% reliable.

ii) Source of Income

- Family members, employed in bigger centres, sent some of their income home every month.
- Government pensions.
- Subsistence farming.

2.2.2 Institutional Profile

2.2.2.1 Status and proficiency of Local Water Services Authority

This area falls under Zululand District Municipality who is the Water Services Authority. The status and proficiency of the WSA to perform its functions regarding the following:

Policy Formulation	Proficient
Planning	Proficient
Regulation	Proficient
Formulating agreements	Proficient
Management (WSP/SSA & Financial)	Proficient
Monitoring and evaluation	Proficient
By-laws	Not in place (being drafted)
Existing WSA/WSP arrangements	Not in place (being drafted)
Financial status quo for service provision	Adequate

2.2.2.2. Identification of existing Water Services Provider

As previously mentioned, the local water committee structures that existed during the development of phase I and II have collapsed. The community no longer supported the committee due to poor services rendered. This resulted in the non functioning of the project.

After having no water for numerous months, volunteers have come forward in an attempt to get the project back in operation. The existing project has now been back in operation on an intermitted basis for more than 18 months. For the purpose of the business plan, one can thus argue that there is no existing Water Services Provider. Once this water project is commissioned the newly elected Bhekumthetho PSC will be abolished and a Water Services Provider will be formed from members of the PSC, Tribal Authority and members of the community democratically. The training given to this community and the PSC, during construction and commissioning, will enable them to become a fully-fledged WSP once the project has been implemented and commissioned.

Status of the existing water phases:

	WARD				
	Zama	Phumeceleni	Maria	Zwelisha	Madresini
Water Available	1 day/week	1 day/week	1 day/week	1 day/week	1 day/week
Level of Service	Household taps	Household taps	Household taps	Household taps	Household taps
State of Meter Reading	Not done	Not done	Not done	Not done	Not done
State of Billing	Collect flat rate	Collect flat rate	Collect flat rate	Collect flat rate	Collect flat rate
Payment for Water (Flat rate basis to project volunteer operators)	60 – 70 %	60 - 70 %	60 - 70 %	60 - 70 %	60 - 70 %

The status and proficiency of the existing Water Committee to perform its functions regarding the following:

Provision of household connections	Not in place
Meter reading	Not in place
Billing an invoicing system	Not in place
Fault reporting systems	Not in place
Payment system at offices	Not in place
Staff requirements at office	Not in place
Location of payment offices	Not in place
Suitability and auditability of banking arrangements	Not in place
Auditability of record and book keeping	Not in place
Complaints facility	Not in place
Institutional arrangements	Not in place
Recovery system for non payments	Not in place
Water quality control systems	Not in place
System for extension of scheme	Not in place

One of the offices in the existing community hall is currently being used as a meeting place when water supply related issues are discussed. It is proposed to reopen the container office in the Zama ward for the use as a paypoint and a second office / paypoint will be constructed to serve the western wards of Bhukumthetho.

This Water Service Provider will be trained during commissioning and mentorship to operate and maintain this scheme and to recover all operational and maintenance costs (Both bulk water supply and reticulation).

2.2.3 Water Source and Supply (See also Annexure C)

2.2.3.1 Water demand

Present and future water demand projections		
Present Population 2001	8 200	People
Present Growth Factor	0	%
Estimated Population 2011	8 200	People
Level of Service 2001	15	Litres/person/day
Level of Service 2011	25	Litres/person/day
Estimated losses	15	%
Present Estimated demand	123	Litres per day
Supply available as at 2001	235	Litres per day
Estimated shortfall 2001	0	Litres per day
Existing storage capacity (3 x 80kl)	160	Litres
Proposed new storage capacity (54hrs)	225	Litres
Estimated demand 2011	205	Litres per day
Supply available as at 2011	235	Litres per day
Estimated shortfall 2011	0	Litres per day

From the above table it can be seen that about 123 000 litres is required per day assuming an initial consumption of 15 litres per person per day.

2.2.3.2 Water source and sufficiency (See also Annexure C)

Presently the community obtains water from springs and streams or from Mondlo Town. The proposed water sources to be used are summarised in the table below. This information has been confirmed by a geohydrological investigation done by Engecon cc (Earth Science Consultants - See Annexure U).

Present Water Sources	Water Quantity available in kl/day	Approx. Present Reliability
Borehole eMondlo no 4	35	100%
Borehole eMondlo no 6	30	100%
Spring	21	60% (winter yield)
Mondlo Water Works	150 kl	100%
Total	235 kl	

It is important to note that all of the above mentioned sources will be available to the whole network.

It is also proposed to utilise water from the existing eMondlo Water Works and reticulate to the existing and proposed reservoirs at Bhukumthetho. The issue of drawing (bulk) water from the Mondlo Water Works has been a sensitive matter and all roleplayers have now agreed to this proposal. The required draw of 150 kl/day is available on the following derived monthly data.

Mondlo Water Works capacity - 8 MI/day
 Draw off to Bhukumthetho - 0.15 MI/day = 1.87% of the capacity

The information in this table was obtained from the SSA – Bateman (Mr Koos Nel).

Month	Average Daily Purified Water Produced (MI)	Percentage Load (%)	Average Daily Township Consumption (MI)	Balance (MI/day) : (Plant Capacity – Consumption)	Average Water level in reservoirs (%)
Jul-01	6.161	77.0%	6.161	1.839	60%
Aug-01	6.876	86.0%	6.747	1.253	70.0%
Sep-01	No data	No data	No data	No data	No data
Oct-01	6.603	82.5%	6.603	1.397	71.0%
Nov-01	6.825	85.3%	6.825	1.175	71.0%
Dec-01	8.453	105.7%	8.453	-0.453	73.5%
Jan-02	7.537	94.2%	7.537	0.463	73.0%
Feb-02	7.471	93.4%	7.471	0.529	75.0%
Mar-02	7.837	98.0%	7.837	0.163	74.0%
AVERAGES	7.22	90.25%	7.204	0.796	70.9%

Thus based on the averages obtained from this table, a supply of 150kl/day to Bhukumthetho should be available. However, the Mondlo Water Scheme is not adequate.

The scheme requires constant maintenance. The Zululand District Municipality have prepared a Works Transfer Business Plan that identifies refurbishment costs of R850 000.00. It is anticipated that the transfer will take place towards middle 2002 followed by the refurbishment process. (Refer to Annexure V)

The issue of water abuse in Mondlo Town is also currently under review by the Abaqulusi Municipality. CMIP has funded the upgrading of services in Mondlo, which includes the installation of metered household connections. This upgrading and the re-registration of water consumers in Mondlo Town is anticipated to have a significant reduction in water consumption. This would imply a significant reduction in the daily production of the Mondlo Water Works.

Total demand of Bhukumthetho = 205kl/day (25l/p/d)
 Yield available = 235kl/day

2.2.3.3 Water quality

Boreholes : The water quality of the two boreholes to be used (Mondlo 4 and Mondlo 6) were previously tested and classified as suitable for human use.

Spring : The water from the Nkunjini spring is clear and suitable for human use.

Mondlo Water Works : Water is purified to SABS specification.

General Note : Water analysis reports – Annexure W.

2.2.3.4 Water infrastructure

Project Name	Present Infrastructure	Is there a Bulk Meter to Measure Supply to the Village/s ?	Estimated % existing Yard connections
Bhekumthetho Phase 1	Two boreholes with electric pumps, 1 x 80kl reservoir with 9km of reticulation (Note : boreholes are now dry)	No	100%
Bhekumthetho Phase 2	Two boreholes with diesel pumps, 2 x 80kl reservoirs with 24.6km of reticulation	No	100%
Mondlo Water Works	Refer to Works Transfer Business Plan & Clause 2.2.3.2	Yes	-

2.2.3.5 Maintenance status and problems

The following technical issues need to be addressed in order to refurbish Phases I and II:

- Overhaul and/or service the existing lister pump stations at boreholes no. Mondlo 4 and Mondlo 6.
- Fencing to these two pump stations.
- Repair a number of minor leakages.
- Drafting of a scheme management plan and appointing of permanent operation and maintenance staff.
- Training of the WSP with **constant** monitoring over a long-term period.
- Technical assistance from the WSA.

2.2.3.6 Water Resource Planning

The Zululand District Municipality is the WSA in this area. The water resource planning was done on a regional level by the Zululand District Municipality and would have no impact on this scheme. The water sources available in this area are mostly from boreholes and springs. The Mondlo Water Works sources its water from the Mondlo Dam. This entire bulk scheme must be assessed in the near future to investigate possible means of upgrading it. The Zululand District Municipality (WSA) is currently in the process of compiling a Water Service Development Plan. This will formulate guidelines towards water resource planning.

2.2.4 Legal

• Water sources and abstraction (Permits and Quotas)

At present, there are no permits or quotas in place. It would be required to obtain a permit for water abstraction, as the predicted daily usage will be more than 50kl/day from surface water. Registration forms were obtained from DWAf and registration is currently taken place.

• Infrastructure

No social or environmental impact assessments were previously done in this area. This scheme was registered at the Department of Agriculture and Environmental Affairs on 08 October 2001 and the EIA reference number is : **EIA/2982**

2.3.2 Institutional Framework

2.3.2.1 Water Services Authority

In terms of the Water Services Act of 1997 the Zululand District Municipality is the Water Services Authority (WSA). The WSA will enter into a formal agreement with the WSP. The Water Services Authority will provide specific support functions to the Water Services Provider such as providing a professional auditing service and participating in negotiations that may arise resulting from failure of Water Services Provider to fulfil the agreements. Some of the functions of the Water Services Authority include:

- access to water services;
- consumers to pay reasonable charges and that such charges are in accordance with any prescribes norms and standards as stipulated in the water Act
- sanction bylaws, which contain conditions for the provision of water services in the area, as specified in the Water Act 108/1997;
- ensure the conservation of water resources;
- ensure the equitable allocation of resources to all consumers and potential consumers within their area of jurisdiction;
- to regulate access to water resources;
- provide institutional support for the project through the appointment of a Service Support Agent;
- enter into an agreements with the Water Service Providers for the provision of water within the area;

The following specific support functions will be provided to the WSP by the WSA:

- Water quality testing
- Routine maintenance inspections
- Auditing
- Capacity building and training
- Monitoring and evaluation

Councillors and Officials Identified

- Mrs V.Z. Magwaza
Mayor of ZDM
- Mr J. Sibiya
Ward Councillor
- Mr Johan de Klerk
ZDM Municipal Manager
- Mr Christo Nel
Manager: Technical Services

2.3.2.2 Bulk Water Provider

Bulk water will be drawn from the Mondlo Water Works. The Zululand District Municipality will be the WSA once the "transfer of works" is implemented. The function of the WSP for bulk water will be finalised during the Works Transfer Phase. The Mondlo Water Treatment Works (bulk supplier) is currently under the authority of DWAF.

2.3.2.3 Water Services Provider/s

The Bhukumthetho Water Service Provider will consist of members from the PSC, Tribal Authority and member of the local water committee. The WSP will enter into a formal agreement with consumers. (See Annexure I).

- Process to identify Water Services Provider Option

The Department of Water Affairs and Forestry poster "Framework for Institutional Arrangements", Poster B – Options For Water Provision, formed the basis of discussions with the PSC regarding a Water Services Provider option. The following options were discussed:

- ❖ Option 1 Local Government as Water Service Provider
- ❖ Option 2 Community based WSP with Water Service Authority support
- ❖ Option 3 Large Organisation as WSP
- ❖ Option 4 Community based WSP with support from Service Support Agent.

Each option was carefully outlined and the Project Steering Committee members had a full understanding of the various options available.

- Criteria for selection of Water Services Provider Option

The following factors were taken into account regarding a suitable WSP option:

- ❖ technical skills and capacity within the community;
- ❖ management skills and capacity within the community;
- ❖ financial Management skills and capacity within the community;
- ❖ experience with regard to a water supply system;

- Recommended Water Services Provider Option

The Project Steering Committee unanimously agreed that option 2 (Community based Water Services Provider with a Water Services Authority) was the most suited choice. The reason for this decision is based on the fact that the Project Steering Committee acknowledge that they will require some degree of support whilst the scheme is in the initial stages.

- Proposed Legal entity to become the Water Services Provider

The Bhukumthetho Water Service Provider will consist of members from the PSC, Tribal Authority and member of the local water committee. The WSP will enter into a formal agreement with consumers.

WATER SERVICES PROVIDER FUNCTIONS		
FUNCTIONS	FUNCTIONARY	
Detail functions under categories		Contracted out to:
Governance: Disciplinary measures to staff WSA Liaison Staff matters	WSP Committee WSP Chairman	Assistance from ISD Consultant
Administration: Meter reading & billing Stores control	WSP Office Worker WSP Maintenance officer	Assistance from ISD Consultant
Finance: Revenue Collection Bookkeeping Banking Financial Reporting	WSP Office Worker WSP Chairman	Assistance from ISD Consultant Assistance from Accountant
Consumer Relations: Accepting applications Complaints	WSP Office Worker	Assistance from ISD Consultant
Operations: Water loss control Pump station control Installing connections Extensions to scheme Security Stock requisitions Water quality monitoring	WSP Maintenance Officer	Assistance from Technical Consultant Assistance from Maintenance Contractors Assistance from Technical Consultant Assistance from ISD Consultant SSA
Maintenance & repairs: Pumps Meters Pipelines Reservoirs Preventative Maintenance	WSP Maintenance Officer	Assistance from Maintenance Contractor
Planning: Densification Phasing	WSP Committee	WSA / Consultant

2.3.2.4 Organogram (relationship between WSA, WSP and customers)

See Annexure G.

2.3.2.5 Transfer of the scheme to the relevant Water Services Authority

In terms of DoRA there will be no transfer of assets for new schemes. Upon commissioning Zululand District Municipality will accept ownership of assets from their appointed Implementing Agent.

The scheme will be transferred from DWAF to the WSA as follows:

- Commissioning of the scheme
- WSP Staff identified and trained
- Contractor's defects liability expired
- Social and technical audit by DWAF and IA
- Conditions of WSA/WSP agreement met
- Transfer of scheme by DWAF to WSA

2.3.3 Water Source and Supply

2.3.3.1 Agreed water demand - design criteria

Design Water Demand

Period	Total Households (Entire Area)	Households served	% Population Served	Consumption l/p/d	Daily Demand	Monthly Demand
Initially	887	300	34%	15	38kl	1 140kl
Year 1	887	600	68%	15	76kl	2 280kl
Year 2	887	750	85%	15	95kl	2 868kl
Year 3	887	835	94%	20	142kl	4 258kl
Ultimate 10 Years	887	887	100%	25	205kl	6 150kl

People not served through this scheme are most likely people that obtain water from ZDM's free water scheme eg. boreholes, hand pumps, stand pipes etc.

The average persons per household = 9.2
 Desired level of service : Household connections
 Affordable level of service : Household connections
 (As requested and paid for by the consumer)

2.3.3.2 Water Source, sufficiency and alternatives

The yields of the boreholes were tested during the construction of the previous 2 phases and the flow of the Nkungini spring was measured during January 2002.

Water source sufficiency Bulk purified water for Mondlo 150kl/day (from the dam)
 Borehole Mondlo 4 35kl/day
 Borehole Mondlo 6 30kl/day
 Nkungini Spring 20.7kl/day

The Bhukumthetho / Mondlo area has very few reliable water sources thus no alternative water sources are available. (Also refer to the Geohydrological Report – Annexure U).

2.3.3.3 Water quality

Water quality will be monitored by the WSA. Samples will be taken by a service support agent at household connections and tested every three months. The WSA will intervene if results are not satisfactory by either upgrading existing purification or by training / re-training maintenance officers.

The water needs to be chlorinated. It is suggested that Chlorman type chlorinators be installed at the three sources. These chlorinators use chlorine cartridges that are easily obtainable and safe to handle. The finished water quality will be potable and acceptable. (Refer to the Water Analysis Reports – Annexure W).

2.3.3.4 Water Infrastructure

2.3.3.4.1 Allocation of funds

Project Name	Phase and Description	Budget Allocated	Will the Project be Self-Sustaining after these Funds (i.e. technically meters are in place and institutionally a trained administrative structure is in place)?
Bhekumthetho Water Supply Project	Phase I	Unknown	No
Bhekumthetho Water Supply Project	Phase II	Unknown	No
Bhekumthetho Water Supply Project	Phase III	R3 100 000.00	Yes

2.3.3.4.2 The scope of technical works consists of

- Bulk water supply and reticulation to all five wards in Bhukumthetho.

This phase applied for, through this business plan, is not overlapping the existing phases in the sense of reticulation networking, it does however supply bulk water to the existing phases.

(See preliminary site plan – Annexure M)

(See detailed Project Cost Estimate – Annexure B)

2.3.3.4.3 Main concept of infrastructure

- Construction of bulk water supply and reticulation
 - * Connection at existing eMondlo water works
 - * Gravity fed bulk supply line to Bhukumthetho
 - * 1 x 225kl reservoir
 - * The extension of existing reticulation system
 - * Repair and upgrading of existing borehole pump stations
 - * Spring protection
 - * Payment Office
- A complete ISD exercise for the project along the DWAF Guidelines.
- A one-year operation, maintenance and mentoring period.
- Transfer of project to the WSA.

2.3.3.4.4 Phasing of work

It is not anticipated that the work will be phased and the entire area will be sufficiently covered by this project.

2.3.4 Cost Recovery Plan

Sustainable cost recovery will be ensured in the following way:

- * Extensive community facilitation, training and participation so that the community knows exactly how they receive their water and why this service must be paid for.
- * Before a household connection is connected, the user is to sign an agreement similar to the attached Annexure F.
- * The WSP will also appoint the following people who will be remunerated by the WSP from funds collected from the sale of water.

Two maintenance officers - who will be responsible for the day to day operation and maintenance of the water project, the meter reading and the assembling and installation of the water meters.

One water office clerk - who will be responsible for the issuing of invoices, receiving of money, issuing of receipts and general bookkeeping for this water project.

Cost Recovery plan:

	ACTION	RESPONSIBILITY	WHEN
1	Workshop / meetings in every ward to make community aware of its responsibility towards the water scheme	ISD Consultant and WSP	Business Plan Phase
2	Get commitment from community	ISD Consultant	Business Plan Phase
3	Implement cost recovery system for consumers (including agreement between WSP and Consumers) (See Annexure I)	ISD Consultant, WSA and WSP	Mentoring period
4	Implement cost recover system and disconnection policy for non payers	ISD Consultant, WSP and WSA	Mentoring Period
5	Appoint a sub committee or a responsible person to address specific complaints from consumers	ISD Consultant and WSP	Mentoring Period
6	Ensure good service delivery to community	WSP Staff	Mentoring Period
7	Mechanisms for communication between the WSP and WSA	WSA and WSP	Mentoring Period
8	Community Awareness – health benefits linked with proper water usage	WSP and ISD consultant	During Construction

2.3.4.1 Role player Involvement

The Water Service Authority is Zululand District Municipality and the Water Service provider for bulk supply and reticulation is the Bhukumthetho Water Service Provider. (The Bhukumthetho Water Service Provider will be formed from the PSC, Local Water Committee and members from the Tribal Authority).

The WSA will formulate and set the local tariff. Bylaws relevant to cost recovery, tariff structure and unauthorised connections will be set by the WSA during TTP.

The WSA will enter into a tariff agreement with the WSP during TTP. The tariffs will be in accordance with the Water Services Act of 1997.

The conditions of service and duties will be covered by the by-laws of the WSA.

2.3.4.2 Community Involvement and Awareness

The ISD Consultant will implement a community awareness programme during implementation of the BP. The following issues will be covered with an awareness programme:

- Payment for services covering tariffs, connection fees, etc.
- The effects of non-payment on the water scheme.
- Disconnection of services for non-payments and re-connection fees.
- The promotion of additional household connection to existing infrastructure.
- Promoting potable water to residents. This will enhance the monthly water sales and enable the project to recover costs.
- Water wastage.
- Vandalism and theft.
- The community must be aware of the responsibilities of the WSP and what their roles are. (eg. Communication on a regular basis).
- Informing local schools, clinics, shops and other businesses of the process to obtain a water connection.
- Liaison with school principles to inform the children of the area regarding the protection of infrastructure, wastage of water and vandalism.
- A Health and hygiene programme will be an integral part of the general community awareness programme.

The strategy followed during the implementation of the community awareness programme will be:

- The social consultant and community members will hold workshops.
- The cost recovery structure will be finalised by the PSC and WSA in a series of workshops.
- Presentation on tariffs and sustainability by the PSC will be done at schools and clinics.
- Posters will be displayed in various public institutions within the areas.
- Community members will be introduced to the scheme when they apply for a household connection.

Social Issues affecting cost recovery, which needs to be focussed on:

- Income level of consumers (Approximately 4% of the consumers' income will be required for services)
- Consumers awareness of responsibilities
- Level of service
- Consumers commitment to pay

2.3.4.3 Tariffs

- By-laws relevant to cost recovery, tariff structure and unauthorised connections are currently been formulated by the WSA and will be available in June 2002. An interim tariff of R4.00/kl will be set by the WSA until such time an official tariff structure is available. Workshops will be held with the PSC to involve them in the process of tariff structuring. This tariff structure will be in accordance with Water Services Act of 1997 and regulations promulgated in terms thereof.
- A formal agreement between the WSA and WSP will be signed during the mentoring period, regarding tariffs, connection fees, penalties, unauthorised connections, cost recovery, etc. (see draft agreement – Annexure I)
- Tariff Calculation

Yearly WSP Expenditure =	R 600	(Chlorination)
	R 24 600	(Diesel for borehole pumps)
	R 56 940	(Payable to K2263 for bulk water)
	R 14 400	(Wages for maintenance officers)
	R 7 200	(Wages for office workers)
	R 2 400	(Wages for temporary workers)
	R 7 800	(Materials for maintenance / replacement)
	R 1 200	(Transport)
	<u>R 600</u>	(Office expenses)
Total	R115 740	(R9 645 /month - WSP)
	R 9 600	(Monitoring and evaluation by WSA)
	R 9 600	(Audits by WSA)
	R 9 600	(Water Testing by WSA)
	<u>R 9 600</u>	(Routine Inspection by WSA)
Total Estimated Cost =	<u>R154 140</u>	

Total estimated cost/month R12 845

1st Year estimated consumption = 600 households x 15 litres x 30 days

(34 % of households @ 15/p/d) = 2 280 kilolitres / month

Monthly O&M Cost = R9 645 (WSP)

Estimated initial tariff = Estimated Cost / Estimated Consumption x factor for losses and non-payment
 = R4.47/kl x 1.15 (factor for losses & non-payment)
 = R5.14/kl

Estimated monthly cost per household @ R5.14/kl = R21.28/month

WSA to subsidise from equitable share – initially R1.14/kl

The following tariffs will be set by the WSA during TTP and revised annually by the WSA:

Household Connection fee : R300.00 (Payable in installments of R20.00 to R50.00)

Monthly consumption : R4.00 per kilolitre

Deficit subsidised by WSA.

Reconnection fee if the user does not pay his account within 30 days after receiving the account R50.00

These tariffs are in accordance with Water Services Act of 1997 and regulations promulgated in terms thereof.

Estimations of the following is made:

90% of households served are likely to be able to afford tariffs

There are no neighbouring water schemes and all wards will be served with household connections.

The community in general indicated their willingness to pay for services. (95%)

2.3.4.4 Service Delivery

Agreements

Consumer agreement

A *Consumer Agreement* was compiled in accordance with specifications set out in the Water Act and is attached herewith as per Annexure H. This agreement will be adopted as the agreement between the consumer and the reticulation Water Services Provider.

No water connection will be made to any premises unless a *Consumer Agreement* is accepted and signed by the potential consumer and the Water Service Provider representative.

The terms of the agreement will be reviewed once the bylaws of the Water Services Authority, becomes available.

The Project Steering Committee has agreed to the following procedures in principal in the event of payment default:

- consumer is issued a notice of payment (Payment due before 7th of next month);
- consumer is issued a final warning (7 Days);
- a committee member will visit the home owner and remind him of disconnection procedures;
- should the consumer still not respond, the water supply to his / her house will be disconnected and a re connection fee will apply;
- the home owner will be called to the Induna for a disciplinary hearing;
- should the defaulter still not respond to arrears payments, the matter will be reported to the Tribal Authority for further legal action.

This will be workshopped with the Water Service provider by the ISD consultant. This will be implemented and managed by the Water Service Provider after commissioning.

Unauthorised Connections

In the event of illegal connections, the culprit is called before the Water Services Provider committee and costs relating to the said connection according to the standards set by the Water Services Provider are determined. The guilty person is then liable for paying all costs to install the connection according to the required standard. In addition to these costs the following procedures are implemented:

- a fine payable to the Water Services Provider is levied. (The fine is determined by the Water Services Provider committee and may depend on the circumstances relating to the case);
- a report regarding the offence is submitted to the Tribal Authority;
- in case of the guilty person, not adhering to the conditions set out by Water Services Provider, the case is reported to the South African Police for conviction. (According to the Water Act).

Provision of water meters and household connection materials

The WSA will formulate and set the local water tariff. Bylaws relevant to cost recovery, tariff structure and unauthorised connections will be set by the WSA in consultation with the WSP during the construction period. The tariffs will be in accordance with the Water Services Act of 1997 taking the free water issue into account. Deficits will be funded by the WSA (from their own funding).

The level of service will be metered household connections. It is a well-known fact that DWAF does not fund the provision of metered household connections. However the existing water project in the community operates through metered household connections and the community has indicated that this project must meet-up with the level of service provided to the other members in their community as "*they are all equal*". Due to the fact that DWAF does not fund the acquired level of service, an alternative approach had to be developed. The following model was then developed in consultation with the community:

- They agreed that each household would pay for their metered yard connection.
- To enable the poor in the community to afford a metered yard connection the project will be divided into two main construction components e.g.
 - ◆ Specialised Work done by a contractor appointed through the award of a tender &
 - ◆ Labour based construction, where the PSC will form a Labour Desk who will undertake the trenching, pipelaying & backfilling as a "*Local Sub Contractor*", employing only local people, and submitting claims, certified by the engineer to the Implementing agent for payment.
- The amount available in the budget for labour is R302 250.00. Construction of the pipelines will take two (2) months should 90 people be employed on a task basis. A minimum of 180 labourers will thus earn between R500.00 and R800.00 per month depending on his/her productivity. This would be an additional income placing the poorest of the poor in the community in a position to pay for their metered yard connection.
- Payment could be made by a R20-R.50 monthly instalment should some households still not be able to afford the yard connection. Through a special arrangement with the WSP & WSA these people would not be denied access to water, and a metered yard connection will be made available to these individuals as long as they contribute towards the monthly instalment.

Meter reading

The Committee is to appoint a meter reader on a part time basis to record household meter readings at the end of each month. A meter reading book will be completed at the end of each month.

Billing / Invoicing system

~~It is proposed that a manual hand system be used for the invoicing and billing from the onset of this project. Billing will be done from the office.~~

Collection

The water offices will serve as a pay point and the community will be able to apply for their connections at this office. The community will have easy access to the water office in order to apply for a connection, pay connection fees and pay for monthly consumption. Maintenance on the reticulation network and installation of household connections will also be done from the water office.

Staffing Requirements

STAFFING REQUIREMENTS OF THE WATER OFFICES		
Designation	Duties and Responsibilities	Delegated Authority
Water Office Clerks (1)	<ul style="list-style-type: none"> - Issue Application forms for household connections - Ensure all Consumer Agreements are signed prior to installations - Issue quotations with maintenance officer - Collect connection payments - Collect water consumption payments - Banking - Non-Payment action - Consumer care 	Reports to the WSP
Maintenance Officers (2)	<ul style="list-style-type: none"> - Determine material requirements for quotations - Household Connections - Preventative maintenance on reticulation - Ordering materials - Reports to WSP - Stock Control 	Reports to the WSP
Meter Readers (1) (Part time)	<ul style="list-style-type: none"> - Recording of household meters on monthly basis 	Reports to the Clerk

Location of payment office

The Othaka Tribal Authority has occupied the existing water office (container) for the use as a Tribal Court. The new water committee will operate from the offices available at the community hall.

The suitability, security and audit-ability of banking arrangements

It is proposed that the water office staff will be responsible for security and banking arrangements. Banking will be done on a regular basis and would depend on the amount of money on hand.

An external bookkeeper (SSA) will do the auditing and monitoring the accuracy of the book keeping and financial records in the office, compiled by the water office clerk.

Planned complaint facility.

The water office will serve as a consumer complaint facility. Should a consumer not be satisfied with the service delivery, he / she will be able to contact the WSP Chairman.

Institutional arrangements.

The WSP will enter into an agreement with each customer (including existing consumers), in which details are given of the conditions under which services will be provided and the responsibility of the customer to pay. Allowance will be made for connection fees and penalties. (See Annexure H)

Free water issue.

~~A strategy for the implementation of the "free basic water" policy is being developed by Zululand District Municipality.~~

Implementation will take place progressively over a number of years and will largely be dependent on the capacity of the District Municipality. In the interim, cost recovery still has to take place and operation of this scheme, or any other scheme cannot be put on hold until these policies and strategies have been developed. This approach whereby current systems of cost recovery remain in place while policies are being finalised has been advocated by the Minister and communicated to the KZN Region by the Directorate.

2.3.4.5 Other Issues

No unauthorised connections were reported in wards with existing water schemes in the Bhukumthetho area. Unauthorised connections will not be tolerated and prosecutors will be penalised by the WSP (with the assistance of the Tribal Authority)

2.3.5 Linkage with other Development Projects and Local Government Integrated Development Plans (IDPs)

No other development projects in the area are currently in progress. Access to a clean and sufficient water supply forms the basis of developmental issues directly relating sanitation, health and hygiene and would therefore support and promote these initiatives within the communities.

The project objectives and implementation plans are communicated to other development initiatives through the local development forums. Regular and ongoing meetings will be held with these forums to ensure open communication channels.

Zululand District Municipality will co-ordinate and address other development projects and local government development plans in this area.

2.3.6 Sanitation and the Environment

2.3.6.1 Sanitation, Health and Hygiene promotion

A Sanitation, health and hygiene promotion will be implemented by the ISD Consultant in conjunction with other government departments such as Health and Education.

The following issues will be addressed:

- The benefits of using potable water from the scheme will be highlighted
- A VIP toilet facility will be promoted for this area by the ISD consultant during implementation. Access to potable water via household connections will minimise the risk of contamination of the drinking water supply.
- Proper methods of dealing with "grey water" from washing and cleaning on properties with household connections via soakaways will be workshopped.
- Training of committees will include issues of sanitation, health and personal hygiene promotion and benefits arising from these items with access to potable water.
- Households and schools will be visited and public meetings held to promote health and hygiene issues.

2.3.6.2 Environmental Impact Assessment

No social or environmental impact assessments were previously done in this area. This scheme was registered at the Department of Agriculture and Environmental Affairs on 08 October 2001 and the EIA reference number has not been made available to date. This matter is being investigated.

2.3.6.3 Water Disposal and Drainage

Only household connections and no public standpipes will be installed. Households will be informed and educated by the WSP, with assistance of the ISD consultant, of the importance of proper drainage such as soakaways at household connections towards "grey water".

2.3.7 Training and Capacity Building

In order to meet with the training and capacity building framework requirements, a facilitator was appointed to facilitate the requirements in developing the Business Plan. The following key issues were covered by Dr Nathi H. Nzimande from MACRO TRAINERS cc in the presence of Mr Thulani Mnyandu from DWAF (Eshowe) and incorporated into this business plan : **(See also the ISD Framework – ANNEXURE F).**

- Duties of a Facilitator
- Roles and responsibilities of all role-players
- The community system
- Project Steering Committee Duties
- Awareness creation
- WSP / WSA
- Community awareness – having meetings with each settlement in the area
- Election of a PSC
- The construction process
- Roles and responsibilities of the O&M staff
- Cost recovery and Level of Service
- etc.

2.3.7.1 Technical skills during construction

Technical training will be done during labour intensive construction, consisting of trenching, pipe laying, plumbing and fittings. This will be done under the supervision of a skilled capacity builder who will provide hands on technical training before and during the labour intensive part of the construction. During the course of the construction period, members of the community will be employed as part of the water project in order to gain construction experience that will enable them to maintain the system in the Operating and Maintenance phase. Especially the maintenance officer, who will be employed by the WSP, after commissioning will benefit from such training.

The following skills training will be provided:

- Pipelaying (approximately 6 people will be trained)
- Working with concrete for construction of valve chambers, reservoirs and small concrete structures (approximately 8 people will be trained)

2.3.7.2 Operations and Maintenance skills

The PSC indicated that Operational and Maintenance skills training were done during the implementation of the previous schemes.

It will be compulsory for the members of the WSP, who will be operating and maintaining the project, to develop training skills.

Two persons will be permanently employed once the scheme is operational. They will be orientated, trained and mentored by the ISD consultant during the TTP

The following will be included in the training:

- Promotion of the Cost Recovery Plan
- Repairs and how to deal with it
- Response time towards faults and leaks

Maintenance Officers

Two (2) maintenance officers need to be employed by the WSP.

Required qualification – Grade 8.

Training requirements of the maintenance staff:

Item	Description	What	Who
1	Backfilling of trenches (storm water damaged)	Compaction, construction of berms diverting water flow	SSA
2	Operation and maintenance of abstraction works, purification plant and pipelines	Operation of valves, scours, cleaning, pipe repairing, time to repair etc.	SSA
3	Scouring of reservoirs	Cleaning	SSA
4	General maintenance	Workshop management, stock control, inventory list, ordering of materials, water loss calculations, transport management.	ISD Consultant
5	Store control system	Spare parts register	ISD Consultant
6	Installation and maintenance of household connections	Assembling of water meters, quotations to home owners	SSA
7	Disconnection of household connections	Notices, disconnection process	ISD Consultant
8	How the system works	Recording of bulk meters, recording of household connections	ISD Consultant
9	Bulk pumpstation & purification works	Technical operation of the pumpstations & purification plant and general maintenance.	Technical Trainer & ISD Consultant
10	Job description and appointments		ISD Consultant/WSP

Office Workers/Clerks

One office worker/clerk needs to be employed by the WSP.

Required qualification – Grade 12.

Training requirements of the office workers

Item	Description	What	Who
1	Consumer registration	Compilation of a register of all water users	ISD Consultant
2	Consumer/WSP Agreements and connection procedure	Completion of consumer agreement forms	ISD Consultant
3	Cost Recovery system	Meter reading, consumption calculations, invoicing, collecting payments, cash receipts, banking etc.	ISD Consultant
4	Disconnection of household connections	Notices, disconnection process	ISD Consultant
5	General office maintenance	Filing systems etc.	ISD Consultant
6	Conflict and Problem solving		ISD Consultant
7	Store control system	Spare parts register	ISD Consultant
8	Monitor and Evaluation	Completion of M&E forms	ISD Consultant
9	How the system works	Recording of bulk meters, recording of household connections	ISD Consultant
10	Job description and appointments		ISD Consultant/WSP

ISD Training and Capacity Building Framework

A Community Participation and Governance

A1 Project Steering Committee (Table A1)

The Bhekumthetho Project Steering Committee comprises community members who represent the five areas that form Bhekumthetho. All community PSC members were elected in a properly constituted community meeting. Most of them were elected to the PSC based on their interest in the development of their area and based on their position within the community.

All of these community PSC members have only partly been involved in the implementation of community projects. Thus, they have of their own accord, requested assistance with training so as to enhance both their governance skills and their ability to participate fully and effectively in the implementation of the Bhekumthetho Project. Their training needs have accordingly been assessed and the full details of this assessment are highlighted in table A1.

A2 Communication System (Table A2)

Communication with the project stakeholders takes place at four levels:

1. *Joint Management Committee Meetings*

The Joint Management Meetings take place once a month. Represented at these meetings are DWAF, the Regional Council and the Implementing Agent (IA). At these meetings, project details are discussed and valuable policy information is shared.

2. *PSC Meetings*

At the PSC meetings, information is shared in the form of minutes and discussions. This is the forum where all project stakeholders meet and debate issues related to the project. These meetings are held once every month and are highly publicised.

3. *Community Development Officers*

Community liaison and labour related issues are discussed and communicated between the project implementing team and the labour teams. This communication is achieved through the Community Development Officers employed specifically to bridge this gap.

4. *Community Meetings*

Communication with project communities is achieved at community meetings, which are held once every three months under normal circumstances. At these meetings, community PSC members report to communities and seek mandates for new proposals. Other project stakeholders attend these meetings in order to support the PSC. Invitation to these meetings is through PSC members and Community Development Officers.

A3 Awareness Creation (Table A3)

Awareness of Government policies and guidelines is created through discussions and information dissemination sessions at community meetings. Perceptions about women involvement in essential decision making positions within community structures are still a problematic subject in this rural community. However, reinforcement of government policies at every opportune moment seems to have an effect on this particular subject. The active involvement of Local Environmental Health Officers amongst project stakeholders has helped in the creation of awareness about health and environmental issues within the project area.

A4 Community Responsibilities (Table A4)

The community of Bhekumthetho truly associates with this water project. Their commitment to the sustainability of their project is shown by their initiation and contribution to a community fund. However, the IA together with other stakeholders have an obligation to ensure that the community is aware of its responsibility and that it takes over its responsibility. The strategy in place is to constantly make the community aware of dangers of the collapse of their project i.e. by stressing the health benefits of their water scheme as well as the potential costs of their alternative sources of water.

The operational team will be trained to operate the WSP as a business. The support agent will initially guide procurement but the WC will have to give final approval of purchases. All labour required would be sourced from the local community. If a surplus is generated it must be used to the community's benefit and must be in line with the Water Committee's constitution. A surplus could well be used to subsidise future household connections.

2.3.8 Mentorship

Follow up visits to the WSP and community will be done by the IA, assisted by consultants, for a twelve months period after commissioning. Visits will include assisting the community in strengthening the community structures such as the WSP and development committees.

The WSP will be mentored by the WSA. During the construction phase, the IA will mentor the WSP. Mentorship after the construction phase will address financial sustainability, establishment of meter reading procedures and billing systems to households with household connections. Fault Reporting, corrective actions and routine maintenance activities will also be monitored.

The IA, WSA and SSA will also give special attention towards the following :

- Establish a Constitution for the WSP
- The promulgating of appropriate water supply bylaws and the establishment of agreements with consumers
- Maintenance and repair procedures
- Adequate office, stores, communication and transport arrangements
- Water loss measurement and control
- Financial management such as banking and paying of workers
- Cost recovery

**TRAINING AND CAPACITY BUILDING FRAMEWORK (A) :
COMMUNITY PARTICIPATION AND GOVERNANCE**

	Objectives	Target Groups	Activities to achieve objectives	Skills Training Needs (topics)	Outputs	Methodology
A1	<ul style="list-style-type: none"> ❖ Establish PSC ❖ Introduction Team ❖ Project Scope & Funding ❖ Community role during Construction ❖ Water Act ❖ Active meeting participation ❖ Community Contributions ❖ Determine ward boundaries ❖ Population Statistics ❖ Location of Offices ❖ WSP Options ❖ Labour employment ❖ Timesheets / Payroll ❖ Task Settings ❖ Supervision ❖ Banking Procedures 	<p>Water Committees All Members Members Members Members Members T/A & Members Members Members Members Labour committee Labour committee Labour committee Labour committee Labour committee</p>	<p>Workshop Meeting Workshop Workshop Workshop Training Module Workshop Physical exercise Physical exercise Physical exercise Workshop Training Module Training Module Training Module Training Module Training Module</p>	<p>Nominations & Election Procedures Introduce uTRC, Consultants etc. Explain scope of project Explain community participation principle Introduce Water Act policies Effective Meetings Explain importance of community contribution Various boundaries must be established Establish population, income & willingness to pay Offices sites must be easily accessible to community Workshop DWAF WSP options Employment procedures Record & Time keeping admin Labour rates & task settings Supervision Training Treasurer – banking procedures</p>	<p>PSC committee established Team introduced Project introduction Community will be actively involved during construction Project to comply with Water Act policies Agenda, Minutes etc. PSC decide on suitable amount & process Boundaries plotted on map / plans Obtain accurate statistics Agreement from all office sites PSC to decide on WSP option L. Desk to supply labour Correct payroll & Timesheets Agreement of tasks & rates Effective supervision Open bank account & reconcile</p>	<p>Voting & election Presentation Discussion & presentation Discussion & presentation Discussion & presentation Training Open discussions Presentation House to house survey Physical exercise Group Discussion Training Training Training Training</p>

	Objectives	Target Groups	Activities to achieve objectives	Skills Training Needs (topics)	Outputs	Methodology
A2 Communication System	<ul style="list-style-type: none"> ❖ Reporting ❖ Status reports ❖ Progress reports ❖ ISD 	<p>PSC</p> <p>Community</p> <p>Tribal Authority IA & DWAF</p>	<p>Meeting with IA & DWAF</p> <p>Mass meetings</p> <p>T/A Meeting</p> <p>Written report</p>		<p>Progress reports -- Technical</p> <p>Progress reports -- Social (ISD)</p> <p>Progress reports -- Financial</p> <p>Progress report from MMC to community</p> <p>T/A reps to report at T/A meeting re project progress</p> <p>ISD Consultant to submit monthly written report to IA</p>	<p>Monthly PSC meeting</p> <p>PSC reps to report to their respective wards</p> <p>Monthly meeting</p> <p>Monthly report</p>
A3 Awareness Creation	<ul style="list-style-type: none"> ❖ Direct communication ❖ Community communication 	<p>Home owners</p> <p>Entire community</p>	<p>Survey</p> <p>Mass meetings</p>		<p>Inform community of project through survey</p> <p>Inform community of project scope and progress</p>	<p>House to house</p> <p>Group discussion</p>
A4 Community Responsibilities	<ul style="list-style-type: none"> ❖ Protection of infrastructure ❖ Payment for Water Connection procedures ❖ Consumer Agreement ❖ Disconnection 	<p>Community / Children</p> <p>Consumers</p> <p>Consumers</p> <p>Consumers</p> <p>Consumers</p>	<p>Discussions & demonstrations</p> <p>Workshops</p> <p>Workshops</p> <p>Workshops</p> <p>Workshops</p>	<p>Community to understand tariff calculation and get a reliable service -- Module</p> <p>Module</p> <p>Module</p> <p>Module</p>	<p>Community & children to be aware that the infrastructure should not be vandalised</p> <p>On time payment of water accounts</p> <p>Consumers to apply at offices</p> <p>Agreements to be signed</p> <p>Disconnection accepted in event of non-payment</p>	<p>Communicate with children through schools</p> <p>Mass meetings</p> <p>Mass meetings</p> <p>Mass meetings</p> <p>Mass meetings</p>

B Sustainable Institutions

TRAINING AND CAPACITY BUILDING FRAMEWORK (B) : SUSTAINABLE INSTITUTIONS						
Objectives	Target Groups	Activities to achieve objectives	Skills Training Needs (topics)	Outputs	Methodology	
B1 Water Service Authority						
B2 WSP with outside organisation as SSA (PSC already decided on this option for WSP)	<ul style="list-style-type: none"> ❖ Staff recruitment ❖ Employment Policies ❖ Operational System ❖ Financial Control ❖ Technical maintenance ❖ Meter reading ❖ Project management ❖ Auditing 	<ul style="list-style-type: none"> Staff for water offices Staff for water offices Staff for water offices Water offices Reticulation infrastructure Consumers Entire project All offices All books 	<ul style="list-style-type: none"> Advertise locally Design policies Training of staff Bookkeeping Preventative & emergency maintenance & repairs Obtain readings from offices & capture data Technical, Financial & Administrative management Conduct financial audit annually 	<ul style="list-style-type: none"> Module -- Criteria for appointing suitable staff Module -- employment policies Intensive training course Technical training Data capturing 	<ul style="list-style-type: none"> Suitable staff Staff to be informed of conditions of employment Effective management system for billing, receipting, payrolls, invoicing, stock control Financial reports / statements Minimal water loss Efficient consumer billing Dynamic reports & management Balance sheets 	<ul style="list-style-type: none"> Advertise, interview, shortlist & appoint staff Workshop Central office to house operation system Qualified bookkeeper Monitor system Monitor consumption Appoint efficient management team Contract Auditors

C Sanitation, Health and Hygiene Promotion

TRAINING AND CAPACITY BUILDING FRAMEWORK (C) : SANITATION, HEALTH AND HYGIENE					
Objectives	Target Groups	Activities to achieve objectives	Skills Training Needs (topics)	Outputs	Methodology
C1 Environmental Health and Hygiene Awareness	Entire community especially children Clinics & hospital	Promote potable water & inform community of health benefits Inform community health workers of project	Illustrations to community	Healthier community & increased water sales Healthier community & increased water sales	Women's groups Mass meetings Posters Through community health workers
C2 Sanitation on System					

D Entrepreneurial Development

TRAINING AND CAPACITY BUILDING FRAMEWORK (D) : SANITATION, HEALTH AND HYGIENE					
Objectives	Target Groups	Activities to achieve objectives	Skills Training Needs (topics)	Outputs	Methodology
D1 Affirmative Procurement Principles and Tendering	offices must be Emerging facilitator	Advertise locally Appoint local facilitator	Full training programme to perform duties Full training provided	Develop local skills & create employment Develop local skills & create employment	Appoint PDI's Appoint PDI's
D2 Small Business and Contractual Management					

3. MANAGEMENT STRUCTURE

3.1 Project Steering Committee

The PSC was elected by the Bhekumthetho community to address and guide development issues within their area. Members of the PSC are representative of all the different wards of Bhekumthetho. The ownership of the scheme has been communicated with the members of the PSC and they understand the principles of ownership. (WSA/WSP relation). Members of the WSA and future WSP are representatives on the PSC.

The responsibility of the PSC is to guide the project through the Project Cycle (initiation, planning and implementation) with input from the IA team. They are the main link between the beneficiaries and the IA.

Number of women on the PSC : 5 of a total of 8 i.e 62 %.

The chairman is Mr Sakhile Mtshali. Refer to Annexure J for PSC details.

- PSC Communication Strategy

The PSC (with the assistance of the ISD Consultant) will inform the community of community meetings in each ward, regarding the water project, which will include issues such as:

- Non-payment
- Obligations and rights of the communities
- Cost recovery process

3.2 Project Steering Committee Sub-Committee

No Project Steering Committee Sub-Committees have been established yet at date of Business Plan submission. Such committee / committees will be established on approval of the Business Plan.

One Labour Committee (Bhekumthetho) will be formed as affiliated sub-committee of the Project Steering Committee. This Labour Committee will be the following :

- Supplying labour (residents within the boundaries of the project) for the trenching, pipe laying, back-filling and testing of reticulation pipelines.
- Supervising and monitoring of tasks as set out in the Contract agreement.
- Invoicing for services rendered to the Contractor and remuneration of Labourers
- Submission of a monthly financial report to the Project Steering Committee
- To register to the respective institutions for the purposes of VAT, Levies, Workman's Compensation, and an IRP 30 Certificate where applicable.

Following conditions will apply with the establishing of a sub-committee :

- The Project Steering Committee may, from time to time, establish a sub-committee or sub-committees amongst the members of the PSC for the attainment of the objectives of the committee and it may, from time to time, disband such sub-committees.
- The Committee may from time to time invite non-members of the community to serve on any sub-committee for such period or periods as it may from time to time determine, provided that no such non-member may exercise the right to vote at any meeting of such sub-committee.

3.3 Project Implementing Agent, Project Managers and Key personnel

Project Manager : Ernst Cloete & Associates cc

Address : P O Box 2083
VRYHEID
3100

Telephone Number : 034-983 2825
Fax Number : 034-983 2945
Cell Number : 082 495 8370
E-mail : eca@dorea.co.za
Contact Person : Eugene Bosch Pr Eng.

IA Project Manager : Zululand District Municipality

Address : Private Bag X76
Ulundi
3838

Telephone Number : 035-870 0812
Fax Number : 035-870 0735
Cell Number : 082 675 0387
E-mail : zrculund@iafrica.com
Contact Person : André Smit

Consultants : Ernst Cloete & Associates cc

Address : P O Box 2083
VRYHEID
3100

Telephone Number : 034-983 2825
Fax Number : 034-983 2945
Cell Number : 082 495 8370
E-mail : eca@dorea.co.za

Key Personnel Technical : Jaco Janse van Rensburg

Address : P O Box 2083
VRYHEID
3100

Telephone Number : 034-983 2825
Fax Number : 034-983 2945
Cell Number : 082 895 5186
E-mail : eca@dorea.co.za

Key Personnel ISD : Will be officially appointed once the Business Plan is approved.

~~**Key Personnel O&M** : Will be determined by following tender procedures as laid down by the IA.~~

3.4 Departmental Managers

National Project Manager : Mr A.M. Muller
Department of Water Affairs & Forestry
Private Bag X 313
PRETORIA
0001
Telephone No. : 012-338 8251
Fax No. : 012-326 2630

Provincial Project Manager : Mr M.L. Badenhorst
Department of Water Affairs & Forestry
P O Box 1018
DURBAN
4000
Telephone No. : 031-306 1367
Fax No. : 031-307 7279

3.5 Overall Management Organogram

The PSC is the decision making body. The organogram clearly indicates the lines of communication between the Department, the IA, the PSC, the LG, the consultants, the contractors and all the communities to benefit from the project. (See Annexure G)

3.6 Reimbursement of PSC members and Sub-Committee members

Provision for reimbursement of PSC members has been made in the project budget and once these funds have been approved they will be administered by the PSC Treasurer.

Claim forms to draw from these funds will be obtained from DWAF.

The PSC has decided that an amount of R70.00 (Seventy Rand) per monthly meeting will be paid to members to cover their costs.

Contact details for the Project Steering Committee – Refer to Annexure J.

4. CONFORMITY WITH DWAF AND RDP GUIDELINES

4.1 Gender issues

The PSC and other role players pledge their commitment to focus on women as the centre of development. Women have been offered equal opportunity to participate at all levels throughout the project cycle so far, and this will continue in the administration, operation and maintenance of the scheme once it has been commissioned. Currently women hold 5 of the 8 positions on the PSC. The PIA is committed to making maximum use of female field staff as Capacity Building Trainers in order to ensure awareness of gender issues.

The involvement of woman in water supply projects is essential as woman are not only beneficiaries and customers but also decision makers regarding the purchase of water and conveyors of good water related practices for their families and children.

The involvement of women during planning and construction phases through membership of the PSC ensures:

- Input on affordable tariff structuring
- Communication with community members to ensure continuing community awareness
- Communication with children with regards to health and hygiene issues
- Communication with children regarding the need to respect and maintain the infrastructure of a water scheme

4.2 Labour-based construction

The contract documentation and project specifications will provide for maximum use of labour as well as maximum employment of the local community. The entire reticulation network will be installed by the community, except where humanly not possible.

Once the project enters the operational phase, job opportunities will reduce drastically but a significant number of residents will have developed skills which will assist them in finding a new career or open up new job opportunities for themselves.

4.3 Involvement of PDI's / PDC's

The involvement of PDI's and PDC's will be used extensively in the ISD team. PDC's will be used for training and capacity building, and PDI's will be used for facilitation and community awareness. Approximately 2 PDI's will be used as facilitators.

4.4 Employment Policy

Principles that are to be considered in setting an employment policy are the following:

- Preference will be given to the unemployed local residents including women who could be employed on a variety of jobs.
- Considering the number of jobs and the requirements of each, fair distribution of opportunities amongst residents will be made by the PSC.
- Rotation of jobs will be applied to ensure maximum opportunities for the entire community.

4.5 Wages and Labour standards

The nature of the project lends itself to task based labour rates for a substantial portion of the project. The PSC will determine all labour rates in accordance with the NPWP standards and will apply these in consultation with the Implementing Agent and the Consultant through the sub-committee elected to oversee the labour component of the project.

Typical task based labour costs on a project of this nature are as follows :
A trench 600mm deep and 300mm wide

TASK	UNIT	RATE (R - c)
Trenching	m	R5.00 - R6.00
Pipe laying	m	R2.00 - R2.50
Back filling	m	R2.50 - R3.00
Supervisor	Day / 30 labourers	R45.00 - R50.00
Timekeeper	Day / 30 labourers	R40.00 - R45.00

A team of 30 with 1 supervisor and 1 timekeeper is on average capable of completing 200m of pipeline per day. At the above rates this converts to a rate of R10.00 - R12.00 /m for the installation of pipelines.

Labour disputes will be handled by the labour sub-committee (or the PSC) who will receive the necessary training on how to handle it.

4.6 Consultants and other Support Services

The implementing agents will recommend a list of consultants to the PSC, which fit the criteria of DWAF with experience in this kind of project. Each consultant will be required to make a presentation to the PSC. The PSC will then be allowed to vote and appoint a consultant of their choice.

4.7 Tender Procedures

Either the Implementing Agents tender and procurement procedures, if approved by the State Tender Board through the Department's Control Committee, or normal State Tender Board regulations i.e. open tender, with award to lowest tender to specification, will be applied. Where possible training on tender procedures and calculation of rates should be provided to small and community based contractors. Should the Implementing Agent Project Manager, or any of the parties represented on the PSC, be of the opinion that the normal tender procedures will disadvantage a small contractor, then the Project Manager will propose an alternative tender procedure for the Department's approval. The criteria used to evaluate tenders will include preference criteria for Small, Micro and Medium Sized Enterprises (SMME's) and affirmative action initiatives.

4.8 The Environment

No permanent negative impact on the environment will be made. All negative impacts will be of a temporary nature such as trenches etc.

The project was registered with the Department of Agriculture and Environmental Affairs under the reference no : **EIA/2982**

4.9 Design Standards

- Level of Service
 - 15l/p/d in 2001
 - 25l/p/d in 2011
 - household connections using 300l/d/household
- Population growth
 - 0% over a period of 10 years
- Losses
 - Allowance of 15%
- Peak demand
 - Bulk water lines – 1.5
- Pressure
 - Minimum 10m
 - Maximum 90m
- Flow Velocity
 - Minimum 0.5 m/s
 - Maximum 3 m/s
- Reservoir Capacity
 - Min. 48 hour storage capacity
- Metering
 - Bulk water meters at outlets of reservoirs

4.10 Water Conservation and Use

The policy on water conservation and use will be addressed during implementation by the ISD consultant.

This Scheme is registered with the Department of Agriculture and Environmental Affairs.

The community will be made aware that water is a scarce resource by presenting workshops in the different wards of Bhukumthetho. Water wastage practices will be discouraged.

Local Community members will be encouraged to report leaks from pipelines to the WSP, who will then attend to the matter.

5. COST ESTIMATE

5.1 Capital Cost

(All items include 14% VAT)

Item	Amount	% of Total
Estimated Construction Cost		
1. Piping	R 339 363.48	10.9%
2. Labour	R 308 250.00	9.9%
3. Reservoirs and weirs	R 404 759.00	13.1%
4. Bulk reticulation	R 850 769.00	27.4%
5. Tools for labour force	R 13 680.00	0.4%
6. Payment Office	R 148 200.00	4.8%
7. Pumpstations upgrade	R 39 900.00	1.3%
8. Fencing	R 27 360.00	0.9%
9. Chlorinators	R 19 950.00	0.6%
10. Contingencies	R 41252.72	1.3%
11. Escalation	R 40 000.00	1.3%
Total Capital Cost	R 2 233 484.20	72.0%
Plus : Business plan fees	R 79 230.00	2.6%
Plus : Implementing Agent Fees	R 61 270.14	2.0%
Plus : ISD Capacity Building and Training	R 191 496.19	6.2%
Plus : Professional Fees	R 337 187.79	10.9%
Plus : Operation and Maintenance (TTP)	R30 000.00	1.0%
Plus : Technical Supervision and Training	R76 587.68	2.5%
Plus : Community Rep. Reimbursements	R10 944.00	0.4%
Plus : Ongoing Monitoring and Evaluation (during TTP)	R79 800.00	2.6%
TOTAL ESTIMATED BUDGET (incl. VAT)	R 3 100 000.00	100%
Population	8 200	
Cost per capita (capital costs)	R 272.37	(Incl. VAT)
Cost per capita (Total costs)	R 378.05	(Incl. VAT)

ZDM has claimed from this budget. The cashflows will be attached accordingly. Refer to Annexure A & B for a detailed cost breakdown.

5.2 Operating and Maintenance Costs and provision for recurring costs

The normal ongoing WSP costs is estimated at R3 200 / month. The cost associated with WSA support such as follow up visits, water testing etc. is estimated at R3 200 per month (refer to Annexure D3). This has been allowed for and it is expected that the WSP will break even within four years. The WSA cost will be subsidised by the WSA utilising the equitable share.

5.3 Funding Plan

DWAF is the Funding Organisation and as such they control expenditure and monitor progress on the project.

Once the basic matters have been approved by DWAF, and the project moves into the construction phase, DWAF and the Implementing Agent will be the highest decision making authority. The Project Steering Committee will be the highest advisory body and will be informed and guided by the project manager and consultants.

Project Name	Phase and Description	Budget Allocation
Bhekumthetho Water Supply Project	Phase III : Extension of existing reticulation network, construction of bulk water supply, pipeline and getting Institutional & Management procedures in place	R 3 100 000.00

5.4 Cash Flow Forecast

Month	Required Cashflow	Cumulative	Actual Allocation
		26200	
Dec-01	R0.00	R26 200.00	
Jan-02	R0.00	R26 200.00	
Feb-02	R80 000.00	R106 200.00	
Mar-02	R250 000.00	R356 200.00	R356 200.00
Apr-02	R350 000.00	R706 200.00	
May-02	R350 000.00	R1 056 200.00	
Jun-02	R450 000.00	R1 506 200.00	
Jul-02	R450 000.00	R1 956 200.00	
Aug-02	R450 000.00	R2 406 200.00	
Sep-02	R350 000.00	R2 756 200.00	
Oct-02	R50 000.00	R2 806 200.00	
Nov-02	R45 000.00	R2 851 200.00	
Dec-02	R131 000.00	R2 982 200.00	
Jan-03	R44 600.00	R3 026 800.00	
Feb-03	R20 800.00	R3 047 600.00	
Mar-03	R12 800.00	R3 060 400.00	R3 060 400.00
Apr-03	R12 800.00	R3 073 200.00	
May-03	R12 800.00	R3 086 000.00	
Jun-03	R12 500.00	R3 098 500.00	
Jul-03	R1 500.00	R3 100 000.00	

5.5 Business Plan Preparation

The IA appointed the consultant to prepare the business plan for the fee of R 79 230.00 incl. VAT.

6. TIME SCHEDULE

6.1 Milestone schedule for the Project

Refer to Annexure N.

Key Point Dates:

- i) Business Plan Approval - May 2002
- ii) Design Complete - February-May 2002
- iii) Implementation Complete - October 2002
- iv) Commissioning Complete - October 2002
- v) Transitional Trial Period ends - June 2003
- vi) Transfer - July 2003

6.2 Effect of delay in the project

Households will continue to suffer without basic services should delays occur.
High risk of waterborne epidemics such as Cholera.
High primary health costs due to illness such as diarrhea etc.

7. REPORTING, MONITORING AND EVALUATION

7.1 Proposed Reporting Procedures

Reporting Procedure during Implementation and TTP

The WSP will be responsible for collecting the data. The WSA (with the assistance of the IA and SSA) will be responsible for the monitoring, evaluation and reporting during implementation of the TTP. The WSA will report back to the WSP and also act if any of the KPI's is not met.

Standard Reporting forms will be developed as part of the Standard Operating Procedures applicable to the different operational sections, e.g. volume of water pumped for the month from the Water Works and the number of households that paid.

The information will be collected by the Clerk and processed into a standard report to be submitted to the WSP at their monthly meetings.

The WSP will evaluate reports on the issues, which are more related to policies and overall performance of the scheme. They will decide on the appropriate actions and give instructions for remedial action, or refer the issue to the WSA for further action / support or resolution.

Reporting Procedure for Project after Transfer

The WSP will be responsible for collecting data, the monitoring and reporting to the WSA on status of the scheme (after the TTP has been implemented). The WSA will be responsible for the evaluation and reporting back to the WSP and also act if any of the KPI's is not met.

7.2 Key Performance Indicators

The standard KPI's (Refer to Annexure O) will be addressed during the implementation of this project. This is implemented as follows:

- Design to commissioning
- Operation and maintenance

7.2.1 Design to commissioning

Progress

- Progress on design programme
- Progress on ISD programme
- Progress on environmental application
- Progress on construction

Financial

- Cost to date
- Cash flow

Employment

- Number of women employed
- Number of youth employed
- Number of men employed

Training and ISD work

- Community awareness and acceptability of project

Management

- Progress reports
- Financial auditing
- Technical auditing
- ISD auditing

7.2.2 Operational and Maintenance KPI's

7.2.2.1 General Performance Indicators

The following general performance indicators will be targeted:

- Service performance indicators
- Financial performance indicators
- Accountability indicators

Various specific indicators have been written for the main stakeholders based on the above categorisation as follows (corrective/ intervention will be triggered as soon as targets are not met):

Key Performance Indicator	Formula	Target	Determination by:	Corrective action: (what/by whom)
<u>Financial</u> F1 Profit/loss	Note 1	100%	Clerk & Trainer	Marketing/LWC, Officials & Trainer Cost cutting/LWC, Officials & Trainer
F2 Unit cost of water	Note 2	R5.00 /kl	WSP	Cost Cutting/UDM Engineering
F3 Debtors	Note 3	20% maximum	Clerk & Trainer	Collect debts/LWC & Officials
F4 Creditors	Note 4	45 days sales maximum	Clerk & Trainer	Pay outstanding amounts/LWC & Officials
<u>Service</u> S1 Unaccounted for water	Note 5	10% maximum	Clerk, Plumber & Trainer	Reduce water losses/LWC & Maintenance Officer
S2 Water supply reliability (a) Length of time for which any customer is deprived of a supply during any one breakdown during the month		<48 hours	LWC & Trainer	Improve response time/LWC, UDM Engineering, Maintenance Officer
(b) Average number of breakdowns experienced by any consumer during a consecutive 3-month period		<2/month	Clerk, Plumber & Trainer	Replace faulty components/LWC, UDM Engineering & Maintenance Officer
S3 Working Supply Points	Note 6	>80%	Clerk, Plumber & Trainer	Purchase necessary items/LWC & Plumber
S4 Water Quality (a) Compliance with criteria	Note 7	>90%	WSP	Maintenance Officer/UDM Engineering
(b) Occurrence of any health risk determinant exceeding specified limits		Nil	WSP	Maintenance Officer/UDM Engineering
<u>Accountability</u> A1 To community	Note 8	4 (significant feedback)	Consensus	Community meetings/LWC & Trainer
A2 Community Awareness	Note 8	4 (significant awareness)	Consensus	Community meetings/LWC & Trainer
A3 Operational policies & procedures being applied	Note 8	4 (significant application)	Clerk, Plumber & Trainer	Improve performance/LWC & Trainer
A4 Monthly financial reports available in good time		Not more than 14 days after month end	Clerk & Trainer	Improve performance/LWC & Trainer

Notes:

1. F1 = $\left[\frac{\text{Monthly income from water sales}}{\text{Monthly direct costs}} \right] \times 100\%$
 2. F2 = $\left[\frac{\text{Monthly direct bulk water costs}}{\text{Monthly volume of bulk water sales}} \right] \times \text{R/kl}$
 3. F3 = $\left[\frac{\text{Total debtors outstanding at month end}}{\text{Total sales in month}} \right] \times 100\%$
 4. F4 = $\left[\frac{\text{Total creditors outstanding at month end}}{\text{Average daily sales in month}} \right] \text{ days}$
 5. S1 = $\left[\frac{\text{Monthly metered bulk water volume} - \text{Monthly volume of sales}}{\text{Monthly metered bulk water volume}} \right] \times 100\%$
 6. S3 = $\left[\frac{\text{Number of working supply points on last day of month}}{\text{Total number of supply points}} \right] \times 100\%$
 7. S4(a) = $\left[\frac{\text{Number of working supply points on last day of month}}{\text{Number of samples tested}} \right] \times 100\%$
8. 1 = Minimal 2 = Limited 3 = Moderate 4 = Significant 5 = Complete

7.3 Monthly Reports

Zululand District Municipality will submit monthly reports on the standard M&E reporting system starting in the first month of the BP approval. This will be done electronically to the Departments Provincial Programme Manager.

7.4 Monitoring and Evaluation

Monitoring and evaluation will be done simultaneously with the reporting procedure described under Paragraph 7.1. An Evaluation Report will be compiled on a quarterly basis (3 monthly) by the WSA. All KPI's will be evaluated. The WSA will monitor and evaluate the project after transfer has taken place.

7.5 Project Close out report

The Implementing Agent will submit a project close out report, after completion of the project. The report will be prepared according to DWAF requirements.

ANNEXURE A

Bhekumthethu Water Supply : (Including Bulk Water Supply)		Total Cost Estimate All figures include 14% VAT		KN 124	
		Totals	Percentage		
1	PIPING	R 339 363.48	10.9%		
2	LABOUR - (Trenching, Pipelaying & Backfilling)	R 308 250.00	9.9%		
3	RESERVOIRS AND WEIRS	R 404 759.00	13.1%		
4	BULK RETICULATION	R 850 769.00	27.4%		
5	TOOLS FOR LABOUR FORCE	R 13 680.00	0.4%		
6	PAYMENT OFFICE	R 148 200.00	4.8%		
7	PUMPSTATIONS - UPGRADE	R 39 900.00	1.3%		
8	FENCING	R 27 360.00	0.9%		
9	CHLORINATORS	R 19 950.00	0.6%		
10	CONTINGENCIES	R 41 252.72	1.3%		
11	ESCALATION	R 40 000.00	1.3%		
12	TOTAL CAPITAL COST	Sub Total : Project Costs	R 2 233 484.20	72.0%	
13	BUSINESS PLAN FEES		R 79 230.00	2.6%	
14	IMPLEMENTING AGENT FEES		R 61 270.14	2.0%	
15	CAPACITY BUILDING AND TRAINING		R 191 496.19	6.2%	
16	PROFESSIONAL FEES		R 337 187.79	10.9%	
	For the first	R 700 000.00	12.50%	R 87 500.00	
	Above	R 700 000.00	10.00%	R 153 348.42	
			Sub Total	R 240 848.42	
	Factor for water in rural areas	1.40		R 337 187.79	
(as per Appendix B1 Form of Agreement for Consulting Services January 2000)					
17	OPERATION AND MAINTENANCE - (Training & Assistance during TTP period)		R 30 000.00	1.0%	
18	TECHNICAL TRAINING & SUPERVISION		R 76 587.68	2.5%	
19	COMMUNITY REPRESENTATIVE REIMBURSEMENTS PSC Representatives		R 10 944.00	0.4%	
20	ONGOING MONITORING & EVALUATION (During TTP)		R 79 800.00	2.6%	
			TOTAL PROJECT COST	R 3 100 000.00	
			TOTAL POPULATION SERVED	8 200	
			TOTAL COST PER CAPITA	R 378.05	

ANNEXURE B

Bhekumthethu Water Supply : Detailed Project Cost Estimate
All figures include 14% VAT

KN 124

No:	Description	Amount	Rate	SUB TOTAL	TOTAL
1	PIPING				R 339 363.48
1.1	80 x 3.5 mm Klambon Piping	250 m	R 72.85	R 18 211.50	
1.2	80mm Klambon Fittings	42 No	R 30.44	R 1 278.40	
1.3	50 x 2.9 mm Klambon Piping	800 m	R 37.73	R 30 187.20	
1.4	50mm Klambon Fittings	134 No	R 18.70	R 2 505.26	
1.5	90mm Class 6 HDPE (50mRolls)	3 000 m	R 20.86	R 62 586.00	
1.6	90mm Pipe Fittings	62 No	R 184.68	R 11 450.16	
1.7	75mm Class 6 HDPE (50mRolls)	1 000 m	R 14.48	R 14 478.00	
1.8	75mm Pipe Fittings	22 No	R 126.94	R 2 792.66	
1.9	63mm Class 6 HDPE (100mRolls)	6 000 m	R 10.26	R 61 560.00	
1.10	63mm Pipe Fittings	62 No	R 75.13	R 4 657.81	
1.11	50mm Class 10 HDPE (100mRolls)	6 500 m	R 7.75	R 50 388.00	
1.12	50mm Pipe Fittings	67 No	R 53.01	R 3 551.67	
1.13	50mm Class 6 HDPE (100mRolls)	3 000 m	R 6.44	R 19 323.00	
1.14	50mm Pipe Fittings	32 No	R 53.01	R 1 696.32	
1.17	Additional Fittings to above	1.0 sum	R 54 697.50	R 54 697.50	
2	LABOUR - (Trenching, Pipelaying & Backfilling)				R 308 250.00
2.1	Excavations	20 550 m	R 5.50	R 113 025.00	
2.2	Backfill	20 550 m	R 5.50	R 113 025.00	
2.3	Testing	20 550 m	R 3.00	R 61 650.00	
2.4	Piplaying (Transport on site)	20 550 m	R 1.00	R 20 550.00	
3	RESERVOIRS AND WEIRS				R 404 759.00
3.1	225kl Reservoir	1 No	R 193 800.00	R 193 800.00	
3.2	Contractors P&G's	1 sum	R 35 000.00	R 35 000.00	
3.3	Fittings to 225kl Res.	5 No	R 13 965.00	R 69 825.00	
3.4	Float valves	1 No	R 3 534.00	R 3 534.00	
3.5	Spring Protection (Weir)	1 No	R 51 300.00	R 51 300.00	
3.6	Pipe fittings to weir	1 No	R 17 100.00	R 17 100.00	
3.7	Steel piping Anchor blocks	100 No	R 342.00	R 34 200.00	
4	BULK RETICULATION				R 850 769.00
4.1	Contractors P&G's	1 sum	R 85 500.00	R 85 500.00	
4.2	160 mm OD Cl.6 uPVC Piping	300 m	R 39.90	R 11 970.00	
4.3	160 mm OD Cl.9 uPVC Piping	2050 m	R 57.00	R 116 850.00	
4.4	160 mm OD Cl.12 uPVC Piping	1150 m	R 68.40	R 78 660.00	
4.5	110 mm OD Cl.6 uPVC Piping	600 m	R 21.09	R 12 654.00	
4.6	Earthworks - Excavations	4100 m	R 62.70	R 257 070.00	
4.7	Pipe Bedding	820 m3	R 80.00	R 65 600.00	
4.8	Earthworks - Backfilling	4100 m	R 30.00	R 123 000.00	
4.9	Donga & Road crossings	4 No	R 11 400.00	R 45 600.00	
4.10	General Fittings	1 sum	R 36 765.00	R 36 765.00	
4.11	Connection at purification works	1 sum	R 17 100.00	R 17 100.00	
5	TOOLS FOR LABOUR FORCE				R 13 680.00
5.1	Picks, Spades etc.	1 No	R 13 680.00	R 13 680.00	
6	PAYMENT OFFICE				R 148 200.00
6.1	Payment Office	1 No	R 148 200.00	R 148 200.00	
7	PUMPSTATIONS - UPGRADE				R 39 900.00
7.1	Service Lister Engines & BH Pumps	2 No	R 17 100.00	R 34 200.00	
7.2	Paint Security Cages	2 Sum	R 2 850.00	R 5 700.00	
8	FENCING				R 27 360.00
8.1	To Pump station and Spring	2 No	R 13 680.00	R 27 360.00	
9	CHLORINATORS				R 19 950.00
9.1	To reservoirs	5 No	R 3 990.00	R 19 950.00	
				Sub Total	R 2 152 231.48

ANNEXURE C

Bhekumthetho Water Supply : Water Demand Estimate

KN 124

POPULATION

Present Population / Settlement to be served

Ward No. & Name	H/H	Popl.
1 Zama	160	1360
2 Phumecezeni	116	1070
3 Maria	275	2845
4 Zwelisha	183	1580
5 Madresini	153	1345
TOTAL	887	8 200

Population growth factor	0.0%	per annum
Design Period	10	yrs
Population in 2011	8 200	
Loss factor assumed	10.0%	
Minimum R.D.P standard	25	litres/person/day

WATER DEMAND

Description	Popul.	15 l/c/d	25 l/c/d
Daily Water Demand (KI)	8 200	123	205
Monthly Water Demand	8 200	3690	6 150

Water Demand 205 KI per day

WATER SOURCES

No	Source Name	Yield	Unit	Reliability	Available Yield
1	Bulk purified water from Mondlo	150	kl/24h	100%	150 KI
2	Borhole: Mondlo 4	70	kl/24h	n/a	35 KI. Recommended Pump Yield
3	Borhole: Mondlo 6	60	kl/24h	n/a	30 KI. Recommended Pump Yield
4	Nkungini Spring	34.5	kl/24h	60%	20.7 KI
TOTAL QUANTITY OF WATER AVAILABLE					235.7 KI

Water Availability 235.7 KI per day

WATER SHORT FALL / SURPLUS

Water Demand 205 KI per day

Water Availability 235.7 KI per day

31 KI Surplus

WATER STORAGE

Description	Size (KI)	Qty	Total
Existing Storage			
Zama Ward	80	1	80 KI
Maria Ward	80	1	80 KI
Zwelisha	80	1	80 KI
New Storage			
Phumecezeni	225	1	225 KI
Total Storage			465 KI
Hours Storage			54 Hours

ANNEXURE D
KN 124

INCOME AND EXPENDITURE FOR A FIVE YEAR PERIOD - BHEKUMTHETHO

	Year 1	Year 2	Year 3	Year 4	Year 5
Operating Costs (Ongoing normal costs)					
WSP Costs					
Diesel	R 800	R 848	R 700	R 756	R 816
Consumption	R 24 000	R 25 920	R 27 594	R 30 233	R 32 652
Bulk Water	R 56 940	R 82 125	R 97 528	R 113 004	R 127 020
Wages	R 14 400	R 15 652	R 16 796	R 18 140	R 19 591
Maintenance officers	R 1 200	R 7 776	R 8 398	R 9 070	R 9 766
Office Worker	R 2 400	R 2 592	R 2 799	R 3 023	R 3 265
Temporary Workers	R 2 400	R 7 776	R 8 398	R 9 070	R 9 796
Chlorination	R 600	R 7 776	R 2 799	R 3 023	R 3 265
Materials	R 2 400	R 2 592	R 2 799	R 3 023	R 3 265
Maint. & Replacement	R 450	R 5 832	R 6 299	R 6 802	R 7 347
Pump	R 5 400	R 5 832	R 6 299	R 6 802	R 7 347
Public Transport	R 1 200	R 1 296	R 1 400	R 1 512	R 1 633
Transport	R 1 200	R 1 296	R 1 400	R 1 512	R 1 633
Consumables	R 600	R 648	R 700	R 756	R 816
Total WSP Expenditure	R 122 340	R 152 757	R 173 811	R 195 389	R 215 996
Income					
New Connections	600 households	150 households	85 households	25 households	10 households
Exist Users	600 households	750 households	935 households	860 households	570 households
Total Users	1200	900	1020	920	580
Consumption/month	2340 kl	3375 kl	4008 kl	4844 kl	5220 kl
% Non payments	15%	15%	15%	15%	15%
Recommended Tariff (R/kl)	R4.00	R4.20	R4.50	R4.50	R4.50
Usager/ Family/(r/day)	130	150	190	130	310
Actual Cost/kl	R 4.36	R 3.77	R 3.61	R 3.51	R 3.45
Total WSP Income	R 95 472	R 137 700	R 171 703	R 213 160	R 239 598
Net Profit/Loss (Operating Deficit)	-R 26 868	-R 15 057	-R 2 108	R 17 770	R 23 602

Assumptions: 8% Escalation per annum on expenditure
 Unit cost of water = R4.25/kl with 8% increase per annum
 Water consumption = 90 litres/household/day (10 litres/person/day)

	Year 1	Year 2	Year 3	Year 4	Year 5
WSA Support (SSA)					
Water Testing	R 9 600	R 10 368	R 11 197	R 12 093	R 13 061
Monitor and Evaluations	R 9 600	R 10 368	R 11 197	R 12 093	R 13 061
Financial Inspections and Audits	R 9 600	R 10 368	R 11 197	R 12 093	R 13 061
Technical Routine Inspections	R 9 600	R 10 368	R 11 197	R 12 093	R 13 061
Net Loss (Operating Deficit)	R 38 400	R 41 472	R 44 780	R 48 373	R 52 243

Assumptions: 8% Escalation per annum on expenditure

COST ESTIMATE FOR LINE ITEMS

ANNEXURE E

Implementing Agents Costs

Description	Hours	Rate	Km	Rate	Costs
Monitor and Evaluate	70	R 250.00	2600	R 1.80	R 22 180.00
Administration	80	R 250.00	120	R 1.80	R 20 216.00
Assets Transfer	65	R 250.00	1460	R 1.80	R 18 878.00
					R 61 274.00

Capacity Building and Training (During Construction)

Description	Hours	Rate	Km	Rate	Costs
<i>See separate annexure attached</i>					
					R 191 469.00

Professional Fees (Design)

(as per Appendix B1 Form of Agreement for Consulting Services January 2000)

For the first	R 700 000.00	12.50%	R 87 500.00
Above	R 700 000.00	10.00%	R 153 348.42
Sub Total			R 240 848.42
Factor for water in rural areas	1.40	R 337 187.79	

Operation and Maintenance (Training during TTP)

Description	Hours	Rate	Km	Rate	Costs
O&M of pumps at Abstraction Works	15	R 220.00	600	R 1.80	R 4 380.00
O&M of pumps at Pumphouse	24	R 220.00	1200	R 1.80	R 7 440.00
O&M of Purification Plant	36	R 220.00	2400	R 1.80	R 12 240.00
O&M of Reservoirs and Reticulation lines	6	R 220.00	600	R 1.80	R 2 400.00
O&M of household connections	4	R 220.00	600	R 1.80	R 1 960.00
Operation of soakaways (Grey water)	2	R 220.00	600	R 1.80	R 1 580.00
					R 30 000.00

Technical Training and supervision (during Construction)

Description	Hours	Rate	Km	Rate	Costs
Trenching	60	R 220.00	4500	R 1.80	R 21 300.00
Pipelaying	96	R 220.00	5315	R 1.80	R 30 687.00
Plumbing	32	R 220.00	2400	R 1.80	R 11 360.00
Timesheets and Administration	8	R 220.00	600	R 1.80	R 2 840.00
Wages and payment procedures	8	R 220.00	600	R 1.80	R 2 840.00
Banking and basic book keeping	8	R 220.00	800	R 1.80	R 3 200.00
Basic Plan reading	10	R 220.00	1200	R 1.80	R 4 360.00
					R 76 587.00

Ongoing monitoring and Evaluation (During TTP)

Description	Hours	Rate	Km	Rate	Costs
Monitor KPI's - Financial	95	R 220.00	3500	R 1.80	R 27 200.00
Monitor KPI's - Service	96	R 220.00	3500	R 1.80	R 27 420.00
Monitor KPI's - Accountability	95	R 220.00	2380	R 1.80	R 25 184.00
					R 79 804.00

CAPACITY BUILDING AND TRAINING - FRAMEWORK

ANNEXURE F

1	COMMUNITY FACILITATION - DURING CONSTRUCTION	Community	Explain LOS to community Explain water tariff and payment for services to community (Staff, office costs etc)	Get Community support for LOS	QTY	ISD REP's	Hours	Rate	Cost	VAT	Total	Acc Sum
1.1	Mass meetings (PSC Reps - LOS)	Community	Explain water tariff and payment for services to community (Staff, office costs etc)	Get Community support for LOS	2	1	8	150.00	2400.00	336.00	2736.00	2736.00
1.2	Mass Meetings (Payment for water)	Community	Explain connection procedures & consumer agreement to community • Community contributions	Get community support for tariff & payment procedures	2	1	8	150.00	2400.00	336.00	2736.00	5472.00
1.3	Mass Meetings (Connection procedures)	Community	Explain connection procedures & consumer agreement to community • Community contributions	Encourage project ownership	2	2	8	150.00	4800.00	672.00	5472.00	10944.00
1.4	General Facilitation not catered for in this budget	ISD Cons / PSC	Unforeseen activities	Problem solving	4	1	8	150.00	4800.00	672.00	5472.00	16416.00
	SUB TOTAL				10	5	32	800	14400	2016	R 16 416.00	16416.00

2	GENERAL FACILITATION DURING CONSTRUCTION PHASE	PSC and labour desk	Train labour desk on task setting & tools	Labour Desk understand procedures	Rate	Cost	VAT	Total	Acc Sum
2.1	Task Setting & Payments	PSC and labour desk	Train labour desk on task setting & tools	Labour Desk understand procedures	150.00	2400.00	336.00	2736.00	19152.00
2.3	Hands-on Field Monitoring	PSC	Ensure employment activities are correct & labour quantities balance with SE	Correct employment quantities	150.00	2400.00	336.00	2736.00	21888.00
2.4	Monthly payroll supervising	PSC	Check all timesheets & prepare invoice for wage claim	Payment of labour / wages on fortnightly basis	150.00	7200.00	1008.00	8208.00	30996.00
2.5	Meeting with engineer on site facilitation	ISD Consultant	Unplanned Facilitation	Resolve social issues that may occur	150.00	2400.00	336.00	2736.00	32832.00
2.6	Installation materials	ISD Consultant	Assist with obtaining quotations & ordering of connection materials	Materials delivered to respective water offices	150.00	1200.00	168.00	1368.00	45891.20
	SUB TOTAL				960.00	25680.00	3595.20	29275.20	45691.20

3	WSP TRAINING	WSP	Train the WSP members re the Water Act and the function they must carry out	WSP members act in accordance to the Water Act	MODULE	Cost	VAT	Total	Acc Sum
3.1	Water Act / Function of WSP	WSP	Train the WSP members re the Water Act and the function they must carry out	WSP members act in accordance to the Water Act	1850.00	1850.00	258.00	2108.00	47800.20
3.2	Constitution	WSP	WSP to be trained on Constitution	Signed Constitution	1850.00	1850.00	258.00	2108.00	49909.20
3.3	Effective Meetings	WSP	Train Secretary re completion of agendas & recording of minutes	Effective meeting procedures	1850.00	1850.00	258.00	2108.00	52018.20
3.4	Community Contributions	WSP	Each household to pay a community contribution	System in place for receiving community funds	1850.00	1850.00	258.00	2108.00	54127.20
3.5	Household Connection procedures	WSP	Explain payment procedures for household connections and how connection costs are determined	Community acceptance of connection costs	1850.00	1850.00	258.00	2108.00	56236.20
3.6	Consumer Agreement	WSP	Explain contents of consumer agreement and the responsibility of the consumer and WSP in terms of the water act	Community accepts the consumer agreement and signs on application of connection	1850.00	1850.00	258.00	2108.00	58345.20
3.7	Staff Employment Procedures	WSP	Determine terms of reference / job descriptions for respective staff members, supervision of staff and reporting systems	Compile staff compliment with for and salaries	1850.00	1850.00	258.00	2108.00	60454.20
3.8	Advertise for staff in community	WSP	Advertise for staff internally and assist WSP with the interviewing & appointing process	Each staff member to be appointed with a detailed job description	1850.00	1850.00	258.00	2108.00	62563.20
3.9	Identify Staff Requirements	WSP	Combined workshop to determine what staffing would be required	Detailed employee profile	1850.00	1850.00	258.00	2108.00	64672.20
3.10	Staff Induction	WSP	Introduce staff to role-players and physical component of project	Field trip and introduction workshop	1850.00	1850.00	258.00	2108.00	66781.20
3.11	Bank recon & Age analysis	WSP	Monthly financial statements to be prepared and financial reports to be submitted to IA & Water Authority	Effective financial reporting	1850.00	1850.00	258.00	2108.00	68890.20
	Sub Total				0	20350.00	2849.00	23199.00	68890.20

4 MEETINGS	Community / Project PSC	ISD Consultant	Monthly project meeting	Monitor progress & obtain community approval for management policies	24	1	8	150.00	28600.00	4032.00	32632.00	101722.20
4.1												
4.2	Contractor	ISD Consultant	Meet with Contractor when required to discuss technical progress & community requirements	Facilitate communication between Contractor & other participating parties	1	1	8	150.00	1200.00	168.00	1368.00	103090.20
4.3	Site Meetings	ISD Consultant	Monthly site meeting with technical team & labour desk	Ensure participating community understands scope of work and performs according to the SES requirements	1	1	8	150.00	1200.00	168.00	1368.00	104456.20
	Sub Total				26	3	24		31200.00	4368.00	35568.00	104458.20

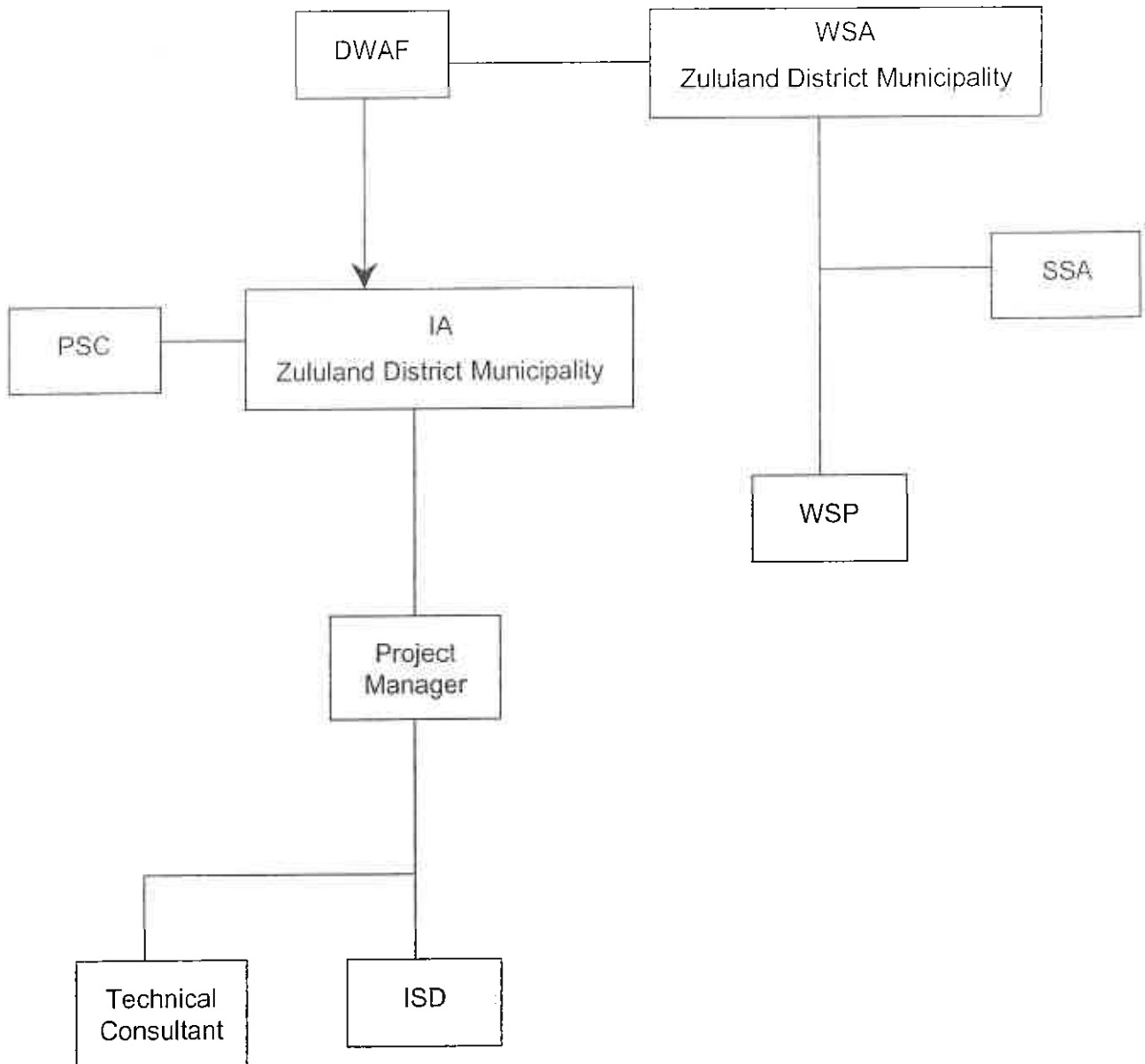
5 TRAINING OF MAINTENANCE STAFF TOWARDS OPERATION AND MAINTENANCE	Maintenance Staff	Maintenance Staff	Maintenance Officers to learn how to calculate a quotation for a water connection and what materials are required	Correct quotation procedures	2	1	8	150.00	2400.00	336.00	2736.00	107194.20
5.1												
5.2	Maintenance Staff	Maintenance Staff	Maintenance staff to do required preventative maintenance / emergency repairs	A checklist to be compiled for Maintenance to carry out each week/month	2	1	8	150.00	2400.00	336.00	2736.00	109930.20
5.3	Maintenance Staff	Maintenance Staff	Maintenance staff to know what materials are required for respective sections of infrastructure	List of suppliers with prices and ordering procedures in place	1	1	4	150.00	600.00	84.00	684.00	110614.20
5.4	Maintenance Staff	Maintenance Staff	Ensure correct delivery checks and record keeping are done	Ensure deliveries are checked, storage of materials and records are kept	1	1	4	150.00	600.00	84.00	684.00	111298.20
5.5	Maintenance Staff	Maintenance Staff	Implement stock control system	Effective Stock control system	1	1	8	150.00	1200.00	168.00	1368.00	112666.20
5.6	Staff (Clerk & M/Officer)	Staff (Clerk & M/Officer)	To ensure itemiser control of each filling materials	Effective stock control	0	1	4	150.00	0.00	0.00	0.00	112666.20
5.7	Meter Readers	Meter Readers	Monthly reading of each metered connection and delivering of water accounts	Meter readers to record correct readings from consumer's meters on route list	1	1	8	150.00	1200.00	168.00	1368.00	114034.20
5.8	Follow-up	ISD Consultant	Ensure staff know what function to carry out	Effective supervision	2	1	8	150.00	2400.00	336.00	2736.00	118770.20
	Sub Total				10	8	52	1200.00	10800.00	1512.00	12312.00	129082.20

6 CLERKS - ADMINISTRATION TRAINING	Clerks & treasurers	Clerks & treasurers	Payroll	Hands on training (Able to perform basic financial control procedures in water office)	2	1	5	800.00	8000.00	1120.00	9120.00	138202.20
6.1												
6.2	Computer literacy	Clerks & treasurers	MS Windows basic Course	Understand PC principles	0	1	5	600.00	0.00	0.00	0.00	138202.20
6.3	Administration Training	Clerks	PAYE, UIF, WCA	Hands-on supervision in offices after course	4	1	8	150.00	4800.00	672.00	5472.00	138202.20
6.4	Guarantee Trust	Clerks & Admin staff	Admin Course	Able to submit correct payments to ROR etc	3	1	8	150.00	3600.00	504.00	4104.00	142306.20
6.5	Consumer details & community participation	Committees	Institutional Reports	Submit accurate reports	1	1	8	150.00	1200.00	168.00	1368.00	143674.20
6.6	ISD Consultant	Office staff	Financial Reports	Accurate control reports	1	1	8	150.00	1200.00	168.00	1368.00	145042.20
	Sub Total				11	5	42		18800.00	2632.00	21432.00	145042.20

7 SUB CONSULTANTS	ISD Consultant	ISD Consultant	Produce monthly reports	Signed Contract agreements	12	1	8	250.00	18000.00	2520.00	20520.00	165582.20
7.1												
7.2	Contract Agreements (WSP - WSA)	WSP	Understand agreements	Signed Contract agreements	3	1	8	250.00	6000.00	840.00	6840.00	172402.20
	Sub Total				3	1	8		24000.00	3360.00	27360.00	172402.20

8 TRAVELLING	ISD Consultant	ISD Consultant	To Bhekumthethu		118	1.50 <th>4 <th>24 <th>18725.60 <th>2341.58 <th>19067.18</th> <th>191469.38</th> </th></th></th></th>	4 <th>24 <th>18725.60 <th>2341.58 <th>19067.18</th> <th>191469.38</th> </th></th></th>	24 <th>18725.60 <th>2341.58 <th>19067.18</th> <th>191469.38</th> </th></th>	18725.60 <th>2341.58 <th>19067.18</th> <th>191469.38</th> </th>	2341.58 <th>19067.18</th> <th>191469.38</th>	19067.18	191469.38
8.1												
	Sub Total				118	1.50	4	24	18725.60	2341.58	19067.18	191469.38

MANAGEMENT ORGANOGRAM



**COMMUNITY WATER SUPPLY SCHEME
(Private Household Connection Agreement)**

Water Services Provider

I, ID no.
from (ward) agree to pay an amount of R..... to the
..... Water Services Provider for the connection of water.

I also agree:

1. That I shall dig the trench from my property to the main pipeline
2. That an employer of Water Services Provider will do the necessary connection to the mainline and install the water meter.
3. To maintain the water meter and protect it from vandalism.
4. To allow an employer of Water Services Provider to read the water meter.
5. To pay my account regularly each month before the seventh of each month at the office.
6. That if I neglect to pay my account, the supply of water will be cut off.
7. That I will pay a fine of R..... for the reconnection thereof.

The Water Services Provider undertakes to:

1. Provide the consumer with a reliable water supply as per section 4 of Act No. 108, 1997.
2. Provide for reasonable notice of intention to limit or discontinue water services.
3. Be fair and equitable.
4. Maintain the bulk pipeline.

I accept the above mentioned agreement on / / at

Signed:

1.
Name: Consumer

2. Witness

3.
Name: Chairperson

4. Witness
Name

MODEL WATER SERVICES AGREEMENT BETWEEN LOCAL LEVEL GOVERNMENT (WATER SERVICES AUTHORITY) AND A COMMUNITY BASED ASSOCIATION ACTING AS A WATER SERVICES PROVIDER

SUMMARY

1. Section 19 of the Water Services Act, Act No 108 of 1997 requires that a written contract be entered into between the **water services authority** for a particular area (the "Authority") – being either the district council, local council, representative council or transitional local council as the case may be – and what is referred to in the Water Services Act as a **water services provider** – which is any person who provides water services to consumers. The water services provider may be a water services committee established by the Minister in terms of the Act, it may be an association, development forum or water committee formed by and representing a community which falls under the jurisdiction of the Authority or it may be some other appropriate body such as a water board or a private sector body.
2. The attached agreement is a **proposed model agreement** for use by the Authority and a **community-based rural** water services provider like a water committee or association. The document serves as a guideline only.
3. The agreement **provides for the appointment of the body as the water services provider** for the community in terms of the Water Services Act (the "Act"). It therefore includes the matters required to be dealt with in terms of Section 19 of the Act, particularly the roles, functions, obligations and powers of each party in terms of the Act. The provisions of the agreement will vary according to the nature of the water services provider. In terms of Section 22 of the Act, no person may operate as a Water Services Provider without the approval of the authority having jurisdiction in the area.
4. Generally each agreement should provide for:
 - 4.1 the date of commencement of the agreement and its duration;
 - 4.2 the appointment of the body as the water services provider;
 - 4.3 the scope of the services to be undertaken by the water services provider and the manner in which such services should be undertaken
 - 4.4 the support to be provided to the water services provider by the Authority;
 - 4.5 amendment and termination of the agreement;
 - 4.6 dispute resolution; and
 - 4.7 other general provisions.

MEMORANDUM OF AGREEMENT

FOR THE APPOINTMENT OF A COMMUNITY-BASED WATER SERVICES ORGANISATION AS WATER SERVICES PROVIDER FOR THE COMMUNITY OF IN TERMS OF THE WATER SERVICES ACT NO 108 OF 1997

ENTERED INTO BY AND BETWEEN

..... (insert name)

being the water services authority (hereinafter referred to as "the Authority") responsible for ensuring access to the service as defined in this agreement to the residents of

..... (insert name)

hereinafter represented by (insert name) in her or his capacity as duly authorised in

terms of a resolution of the Authority passed on the of 20...., a copy of

which is attached to this agreement as Annexure (I).

AND

..... (insert name)

a voluntary association / trust / S21 company (delete what is not applicable) (hereinafter referred

to as the "Committee") duly constituted to support the provision of the services to the

Community of (insert name)

herein represented by (insert

name) in her or his capacity as Chairperson duly authorised in terms of a resolution

passed by the Committee in accordance with its founding constitution / trust deed /

articles of association ("founding document") (delete what is not applicable), a copy

of which resolution is attached as Annexure (II) and a copy of the founding document is

attached as Annexure (III).

PREAMBLE

WHEREAS:

- A. The Water Services Act no. 108 of 1997 (the "Act") which came into operation on the 19th of December 1997 records the right of every person to access to basic water supply and basic sanitation. **(S3 (1) of the Act)**.
- B. The Committee has been providing water supply and/or sanitation services **(delete what is not applicable)** as described in Annexure (IV) (the "services") to the Community presently living in **(insert area)** (the "Community").
- C. The Authority, as the water services authority in terms of the Act, has the statutory responsibility to ensure access by the Community to basic water supply and sanitation services. **(S's 1 (xx), 3(2) and 11)**.
- D. In accordance with the Act, the Authority has agreed to appoint the Committee as the water services provider and the Committee wishes to accept this appointment for the period determined in this agreement to provide the services to the Community. **(S's 19(1)(b), 6 and 22)**.

IT IS HEREBY AGREED AS FOLLOWS:

1. Commencement Date and Duration of Agreement

- 1.1 The agreement will commence on the of 20..... ("date of commencement").
- 1.2 This agreement will continue for a period of **(insert number of months or years)** from the date of commencement of the agreement until the or for a longer period as the parties may agree to in writing. **(S22(2)(a))**

2. Appointment

- 2.1 The Authority appoints the Committee as the water services provider for the Community in the area known as (the "service area") and the Committee agrees to accept such appointment to provide the services described in Annexure (IV) on the terms and conditions set out in this agreement.
- 2.2 As water services provider, the Committee will take all reasonable measures to realise the right of every person in the service area to access to basic water supply and/or basic sanitation **(delete what is not applicable)** and to adhere to the measures provided by the Authority in its water development plan, when adopted, to realise these rights. **(S3(2), (3) and S62(1)(c))**

3. Scope of Services

- 3.1 The Committee will provide the services described in Annexure (IV) to this agreement in accordance with the provisions of the Act and any regulations or guidelines prescribed under the Act.
- 3.2 The Committee will provide the services in the service area.
- 3.3 The Committee shall, with the support of the Authority and in consultation with the Community, set terms and conditions for the provision of the services to the Community which conditions shall:
- 3.3.1 be accessible to the Community;
- 3.3.2 be consistent with conditions for the provision of the services in by-laws made by the Authority and with the provisions of the Act' and

- 3.3.3 provide for:
- 3.3.3.1 the technical conditions of supply, including quality standards, units or standards of measurement, verification of meters, acceptable limits of error and procedures for the arbitration of disputes relating to measurement of services provided, how consumers can apply to the Committee to be connected, future conditions of supply'
 - 3.3.3.2 the determination and structure of tariffs, this will be set by the Authority and be reflected in the conditions set by the Committee;
 - 3.3.3.3 the conditions for payment;
 - 3.3.3.4 the circumstances under which the services may be limited or discontinued;
 - 3.3.3.5 procedures for limiting or discontinuing the services including reasonable notice to consumers, hearings for affected consumers;
 - 3.3.3.6 the installation, alteration, operation, protection and inspection of services works and consumer installations;
 - 3.3.3.7 the prevention of wasteful or unlawful use of services provided by the Committee and
 - 3.3.3.8 measures to promote water conservation and demand management. **(S4(1) and (2))**
- 3.4 The Authority will, on written request by the Committee and within a reasonable time of such request being made, obtain all permits and licenses, acquire such land and register such servitude's as may be necessary for the provision of the services.
- 3.5 Ownership of all infrastructure and assets relating to the services will vest in the Authority for the duration of this agreement.
- 3.6 The Committee will on a fair and equitable basis, with reasonable warning and in accordance with the provisions of the Act, set and enforce procedures for limiting or discontinuing services.
- 3.7 The Committee may not unreasonably exclude any person in the Community from access to the services.
- 3.8 The Committee will be responsible for the collection of all tariffs and collection of all amounts owing to the Committee in respect of the services.
-
- 3.9 The Authority will be responsible for the setting of tariffs, in consultation with and based on proposals made by the Committee. Tariffs used may not differ substantially from any prescribed norms and standards and will comply with national standards and conditions prescribed in terms of the Act. **(S9(4) and S10(4) and in terms of the Local Government Transition Act)**
- 4. Service Responsibility**
- 4.1 The Committee will provide the services on a progressive, efficient, effective, equitable, affordable and sustainable basis and will adhere to the following principles: **(S11(1))**
- 4.1.1 decisions regarding new projects relating to the provision of the services will be taken in a democratic manner involving Community members; and
 - 4.1.2 Community members will pay tariffs, as set by the Authority, for the services provided by the Committee.

- 4.2 The duties of the Committee will be undertaken subject to the following:
- 4.2.1 the availability of resources;
 - 4.2.2 the need for an equitable allocation of resources to all consumers and potential consumers in the service area;
 - 4.2.3 the need to regulate access to the services in an equitable way;
 - 4.2.4 the duty of consumers to pay reasonable charges;
 - 4.2.5 the duty to conserve water resources;
 - 4.2.6 the nature, topography, zoning and situation of the service area;
 - 4.2.7 the right of the Committee to limit or discontinue provision of the services.
- 4.3 The Committee will comply with all by-laws made by the Authority in terms of the Act in so far as these relate to the provision of services to the Community. **(S4(2)b))**
- 4.4 The Committee will ensure that procedures for limiting or discontinuing water provision and services in the Community are on a fair and equitable basis and will keep records of all notices given and hearings held. **(S4(3))**
- 4.5 The Committee will have all the powers set out in the Powers of a Water Service Provider in Annexure (V) and will where necessary amend its founding document to make provision for such powers.
- 4.6 The Committee must be and remain legally constituted and representative of the Community. The founding document must be consistent with the provisions of this agreement. The Committee must furnish the Authority with copies of any changes to its founding document.
- 4.7 Decisions of the Committee as to new infrastructure to be constructed for the community, subject to the approval of the Authority, will, as far as possible, involve the community who will be informed of all activities of the Committee.

5. Information sharing

- 5.1 The Committee will give the Authority any information concerning the provision of the services to the Community as the Authority may reasonably request. **(S23(a))** The Committee will every 6 months or at such periods as may be agreed between the parties furnish the Authority with a written report on the provision of the services. The report shall include all details and information reasonable requested by the Authority.
-
- 5.2 The Committee will provide the Authority with any information and support required to prepare its water services development plan in terms of the Act.
- 5.3 **(insert name)** will be the contact person on behalf of the Authority. In undertaking the functions specified in this agreement and in terms of the Act, the Committee will report to **(insert name)**. The parties can change the above mentioned persons by giving notice in writing of the new person to the other party.
- 5.4 The Committee will furnish the Community with all information relating to the provision of the water services, the progress of projects undertaken, the benefits from such projects and the general status of the funds of the Committee. **(S23(d))**
- 5.5 The Committee will furnish the Minister of Water Affairs and Forestry ("Minister") and the Province with all information relating to the provision of the water services, as he or she may reasonably require. **(S23(d))**

6. Accountability

- 6.1 Financial Statements will be prepared by the Committee and checked by an independent person with the appropriate financial skills within three months after the end of each financial year, in accordance with generally accepted accounting principles and practice, and will reflect clearly the affairs of the Committee.
- 6.2 The Committee will allow the Authority and/or the Minister access to its books, records and physical assets to monitor its functions in terms of the Act. **(S62(2))**
- 6.3 The Committee will proactively from time to time survey the needs and determine and within a reasonable time address any complaints of the Community.
- 6.4 The Committee will preserve all documents and accounting records for a period of three (3) years and allow the Authority, Minister and Community at any reasonable time to have such documents and records audited by a person or persons nominated by the Authority, Minister and Community at their cost.
- 6.5 A copy of the Annual Financial Statements of the Committee will be made available to the Authority.

7. Support Arrangements

- 7.1 The Authority will, if requested to do so by the Committee and specifically in respect of the scope of the services to be provided by the Committee, provide reasonable support to the Committee in respect of the following:
 - 7.1.1 the matters referred to in Annexure (IV);
 - 7.1.2 access to specialist services as may be reasonable in the circumstances;
 - 7.1.3 information needed to effectively provide the water services;
 - 7.1.4 financial management support and budgeting;
 - 7.1.5 costing options;
 - 7.1.6 general management of the Committee;
 - 7.1.7 planning support;
 - 7.1.8 interaction with various levels of government;
 - ~~7.1.9 dispute resolution; and~~
 - 7.1.10 any other matter as may be agreed between the Authority and the Committee.

8. Voting and Membership

- 8.1 The election of Committee members will be democratic and in accordance with the founding document of the Committee.
- 8.2 Voting rights of members of the Committee will be in accordance with the founding document of the Committee.
- 8.3 The Authority may be represented as an institutional member of the Committee with voting right or rights equal to that of any other member of the Committee.
- 8.4 The Authority's representative will regularly attend Committee meetings either as a member or in an *ex officio* capacity and actively facilitate a process of reporting between the Authority and the Committee and the Committee and the Authority.

9. Amendments to this Agreement

- 9.1 The parties will amend this agreement in the event that the Minister, in terms of the Act, prescribes new or alternative provisions for inclusion in this agreement.
- 9.2 The parties may amend this agreement by agreement between them. **(S19(5))**
- 9.3 Any change or addition to this agreement must be in writing and signed by the parties to be valid.

10. Breach of Agreement

- 10.1 Should either party fail to comply with any of the conditions of this agreement, the other party will be entitled, without prejudice to any other rights that it may have, to call on the defaulting party by written notice to rectify the breach within 60 days of the date of receipt of the notice, provided that
- 10.1.1 a shorter notice period may be specified should the nature of the breach or the urgency of a particular situation reasonably require this and provided further than;
- 10.1.2 the Authority may assume the function of the Committee to the extent and for the period necessary to meet established minimum standards for providing the services. Any assumption in terms of this clause must be reviewed on a weekly basis by the parties.

11. Termination of Agreement

- 11.1 This agreement cannot be terminated without just or lawful cause.
- 11.2 This agreement may be terminated in the event of the defaulting party failing to rectify the breach in terms of clause 10 within the notice period. If the breach or remedial action itself is in dispute, dispute resolution procedures must be instituted.
- 11.3 On termination of this Agreement, without prejudice to any right that either party may to claim damages and/or compensation, the Authority will take over the provision of services.

12. Dispute Resolution

- 12.1 by arbitration in the manner set out in this clause, subject to the arbitration proceedings being held within 60 days of a party calling upon the other to enter into arbitration proceedings. In the event that arbitration proceedings are not held within that period ~~either party shall be entitled to approach a competent court.~~
- 12.2 The arbitration proceedings will be held on an informal basis, in an attempt to reach a decision as quickly and as inexpensively as possible, while always observing the principles of justice. A bona fide attempt must first be made to resolve any differences between the parties on a basis of negotiation and equity.
- 12.3 Each party to the dispute can be represented at the arbitration proceedings by its legal representatives and/or any other expert or specialist retained by it.
- 12.4 The Arbitrator will allow each party to present such evidence and argument as the Arbitrator may consider to be relevant to the matter in dispute.

- 12.5 The Arbitrator will be a suitably qualified person/s as the parties may mutually agree; and if no agreement is reached by appointment by the Minister/MEC responsible for local government matters in the province, who will, in appointing the arbitrator, have regard to the qualifications and experience of the appointee in relation to the nature of the dispute over which she or he has to adjudicate. In case the Arbitrator resigns or becomes unable to act, a successor will be appointed in the same manner as set out in this clause for the appointment of the original arbitrator and the successor will have all the powers and duties of her or his predecessor.
- 12.6 The arbitration will be conducted in the Province at a place determined as deemed appropriate by the Arbitrator, who will apply the law of South Africa.
- 12.7 Notwithstanding the foregoing, the Arbitrator can, but is not obliged, in such circumstances as she or he may consider appropriate to base the award not only upon the applicable law but also upon broad principles of equity and fairness, having due regard to the circumstances of the parties and the nature of the matter in issue and the general public interest therein.
- 12.8 The decision of the Arbitrator will be final and binding upon all the parties and capable of being made an Order of Court on application by any of them.
- 12.9 Nothing herein contained or implied will preclude the parties from applying to Court for a temporary interdict or other relief of an urgent and temporary nature pending the award of the Arbitrator hereunder.
- 12.10 In view of the public interest, and the social imperatives to resolve disputes quickly and inexpensively, the Arbitrator is vested with powers to make interim orders and to give directions as to alternative provisions, which are to be implemented by the parties in the event of circumstances arising which in the opinion of the Arbitrator render such interim orders or directions desirable, in the interest of all parties concerned.
- 12.11 The costs of and incidental to any proceedings will be in the discretion of the Arbitrator, who will be entitled to direct that they be taxed as between "party and party" or as between "attorney and client".
- 12.12 The Magistrate's Court will have jurisdiction to try any matter arising out of this agreement

13. Whole Agreement

- 13.1 This agreement, including the Annexures, constitutes the whole agreement between the parties and no representations, warranties, undertaking or promises of whatever nature which may have been made by either of the parties, their agents or employees, whether verbally or in writing, other than those in this agreement will be binding or enforceable against them.
- 13.2 This agreement will not constitute or be construed as one constituting one party as the agent of the other.

14. Addresses

The parties choose as their *domicilim citandi et executandi* for the purposes of correspondence and the service of any legal documentation, the following addresses:

..... (physical address)

..... (The Authority)

..... (physical address)

..... (The Authority)

The parties can change the above mentioned addresses by giving notice in writing of the new address to the other party.

THUS DONE AND SIGNED AT ON THE DAY

OF 20...

AS WITNESSES:

1.

2.

THE AUTHORITY

THUS DONE AND SIGNED AT ON THE DAY

OF 20...

AS WITNESSES:

1.

2.

THE COMMITTEE

RESOLUTION OF THE AUTHORITY

ANNEXURE I

ANNEXURE II

RESOLUTION OF THE COMMITTEE

ANNEXURE I

ANNEXURE III

FOUNDING CONSTITUTION OF THE COMMITTEE

SCOPE OF THE SERVICES: (community specific)

1. Existing Infrastructure:

The Committee will assume responsibility for and manage the existing infrastructure comprising:

1.1 _____

1.2 _____

1.3 _____

1.4 _____

1.5 _____

(indicate all assets in a plan and describe all mechanical equipment together with the service record. Describe when equipment was installed and the servicing requirements (the "works").

2. Licenses, Permits and Authorities:

The following licenses, permits, authorities and/or agreements are held by or in favour of the Committee:

3. Responsibility:

In respect of the services, the Committee will be responsible for providing the following: **(describe the extend of the responsibility eg bulk, reticulation, quality requirements, quantity requirements, planning and construction of new infrastructure, responsibility for training of staff and skills transfer to other community members)**

4. Support by the Authority:

In addition to the provisions of clause 7 of the agreement, the Authority specifically agrees to provide the support described below:

.....
.....
.....

5. Duties and Obligations of the Committee

In addition to the duties and functions of the Committee set out in the agreement, the Committee will have the following general duties and obligations:

- 5.1 To compile budgets for the Committee.
- 5.2 To interact with stakeholders, the Authority and higher levels of government on behalf of the Community.
- 5.3 Conditions set by the Committee must be submitted to and approved by the Authority before they come into effect.
- 5.4 Members of the Committee must perform their duties with honesty, care and diligence and must disclose any conflict of interest.
- 5.5 To be responsible for the management and maintenance of work carried out in performing the functions of the Committee, provided that the Community shall be consulted in respect of new infrastructure when reasonably necessary and to undertake the necessary planning for this.
- 5.6 With regard to the procurement of goods and services, to ensure that tenders are open to all interested parties.
- 5.7 Where necessary, ensure that contractors to whom contracts are awarded are insured and remain insured in terms of contractors-all-risk-insurance policies.
- 5.8 To insure and keep insured at the replacement value, its interests in any project against risks.
- 5.9 If required, ensure that an acceptable performance guarantee is furnished by a contractor to whom a contract is awarded in terms whereof the completion of such contract is guaranteed.
- 5.10 All cheques, promissory notes, and other documents requiring signatures on behalf of the Committee, will be signed by two (2) members of the Committee one of whom must be the Treasurer or her or his delegate.
- 5.11 In respect of the funding of the Committee:
 - 5.11.1 To immediately upon receipt, deposit all monies not invested by it as aforesaid, in a suitable account to be opened in the name of the Committee, with a registered Bank or Building Society.
 - ~~5.11.2 All capital and accrued income to be administered by the Committee ("Funds") of the Committee may be increased from time to time with donations, assets and/or property from any source.~~
 - 5.11.3 Members of the managing committee of the Committee may be paid out of the Funds of the Committee, at a level approved by the Authority.
 - 5.11.4 The Committee must ensure that the Funds are used only to perform its functions.
 - 5.11.5 The Committee must ensure that no Funds or part of it is paid or transferred, directly or indirectly to any of the members of the Committee by way of profit distribution, or in any other way; provided that nothing contained in the agreement will prevent the payment in good faith to any person (including a member) of reasonable remuneration for services actually rendered to the Committee and reimbursement of actual costs, expenses and commitments reasonably incurred on behalf of the Committee and with its authority.

POWERS OF THE COMMITTEE

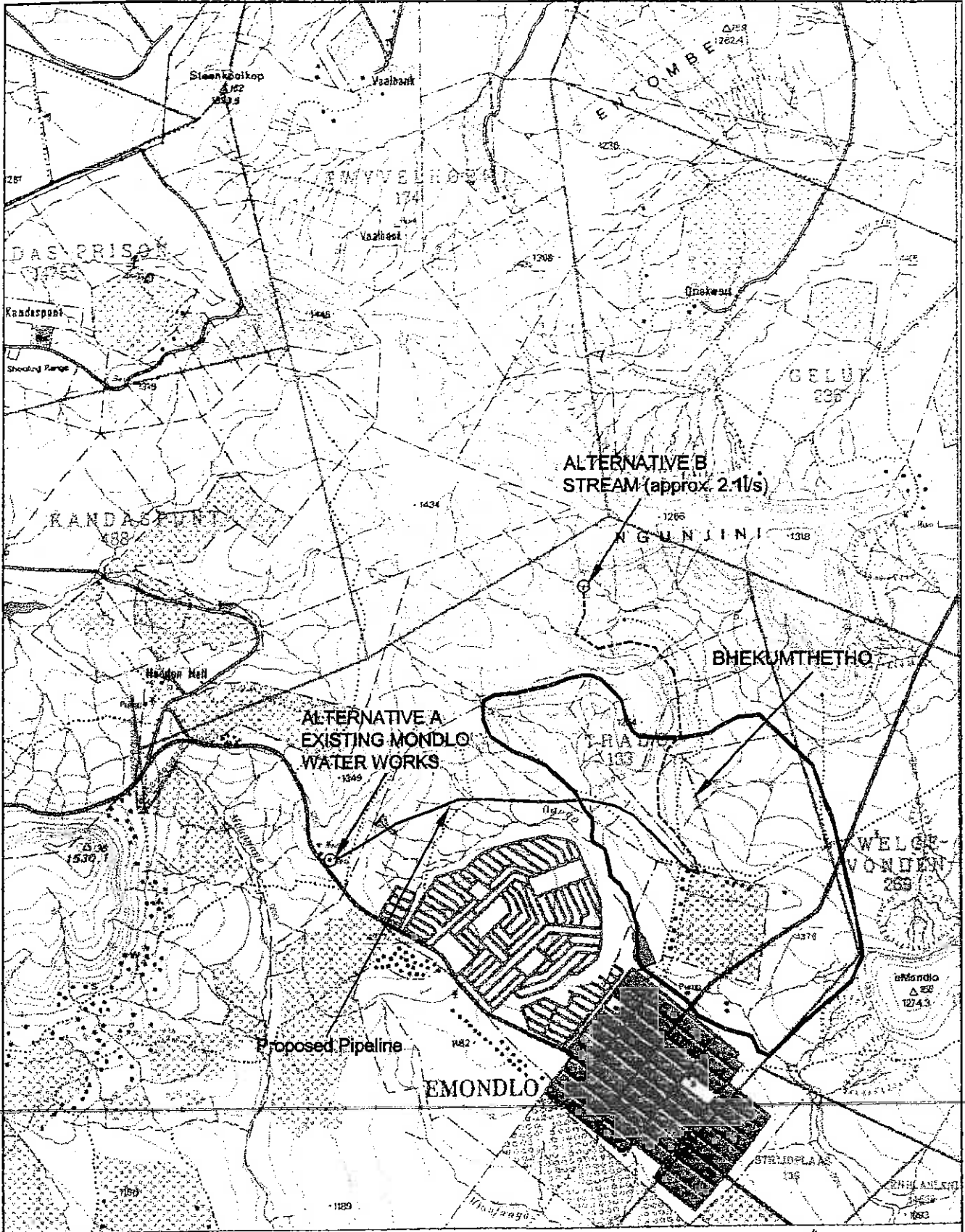
The Committee will have all the powers and authorities as it may consider necessary and appropriate to effectively administer the Committee and perform its functions in terms of the agreement including the following:

1. To delegate any of its powers to a member of the Committee or of its managing committee, a sub-committee of the Committee or to a competent employee.
2. To obtain or administer property or assets of the Committee for purposes of performing the functions in terms of this Annexure.
3. To decide when meetings of the Committee should be convened, and the business to be placed before such meetings.
4. To seek and, subject to the prior written approval of the Authority, accept donations and contributions to perform its functions.
5. Subject to the prior written approval of the Authority to borrow monies to perform its functions on terms and conditions that the Committee considers appropriate, subject to the prior written approval of the Authority.
6. To plan, develop, sub-divide, improve and/or upgrade any immovable property obtained by or owned by the Committee and to register servitudes.
7. To enter into contracts on such conditions as it considers appropriate.
8. To apply the Funds of the Committee in undertaking the functions of the Committee. In applying the Funds and undertaking projects for the Community, the Committee will at all times have regard for the wishes and needs of the Community as expressed democratically at meetings of the Community called by the Committee from time to time.
9. To appropriate and pay any amount as the Committee considers necessary to perform the functions of the Committee.
10. To determine the policy and criteria to be taken into consideration when awarding contracts for items and services to be financed by the Funds.
11. To call for and institute legal action for recovery of monies owing to the Committee by Consumers or other persons or bodies.
- ~~12. To appoint an auditor if required.~~
13. To employ and terminate the employment staff.
14. To appoint agents, contractors and consultants to provide specialist advice, support and services.
15. To open a bank account and to invest funds of the Committee not immediately required.

BHEKUMTHETHO CWSS PSC DETAILS

KN 124

PROJECT VAL. (INCL. VAT)	R 3 100 000.0000	NAME	CONTACT NO.
INKOSI		Inkosi J.B. Mdlalose	
INDUNA		Mr M.A. Kunene Mr M. Nkosi Mr A.S. Sibiya	
REPRESENTATIVE ZDM COUNCILLOR		Mr J. Sibiya	082 954 2220
ZDM TECHNICAL REPRESENTATIVE		Mr J. Jordaan	
DWAF REPRESENTATIVE		Mr T. Mnyandu	082 803 3305
	DESIGNATION		
WATER PROJECT STEERING COMMITTEE	Chairman	Mr Sakhile Mtshali	083 698 8360
MEMBERS	Vice Chairman	Mr Thulani Maphisa	
	Secretary	Ms Nomusa Mthembu	
	Vice Secretary	Ms Sphiwe Shongwe	
	Treasurer	Ms Sonto Khanyile	
	Members	Mrs Evelyn Nyathikazi	
		Ms Ntombi Shabangu	
		Mr Nkosinathi Mthethwa	
	Es-Officio Member	Mr Jerry Sibiya	



SITE PLAN (Scale 1:50000)

BULK WATER SUPPLY AND RETICULATION FOR BHEKUMTHETHO (NEAR MONDLO)

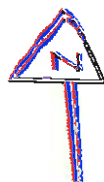
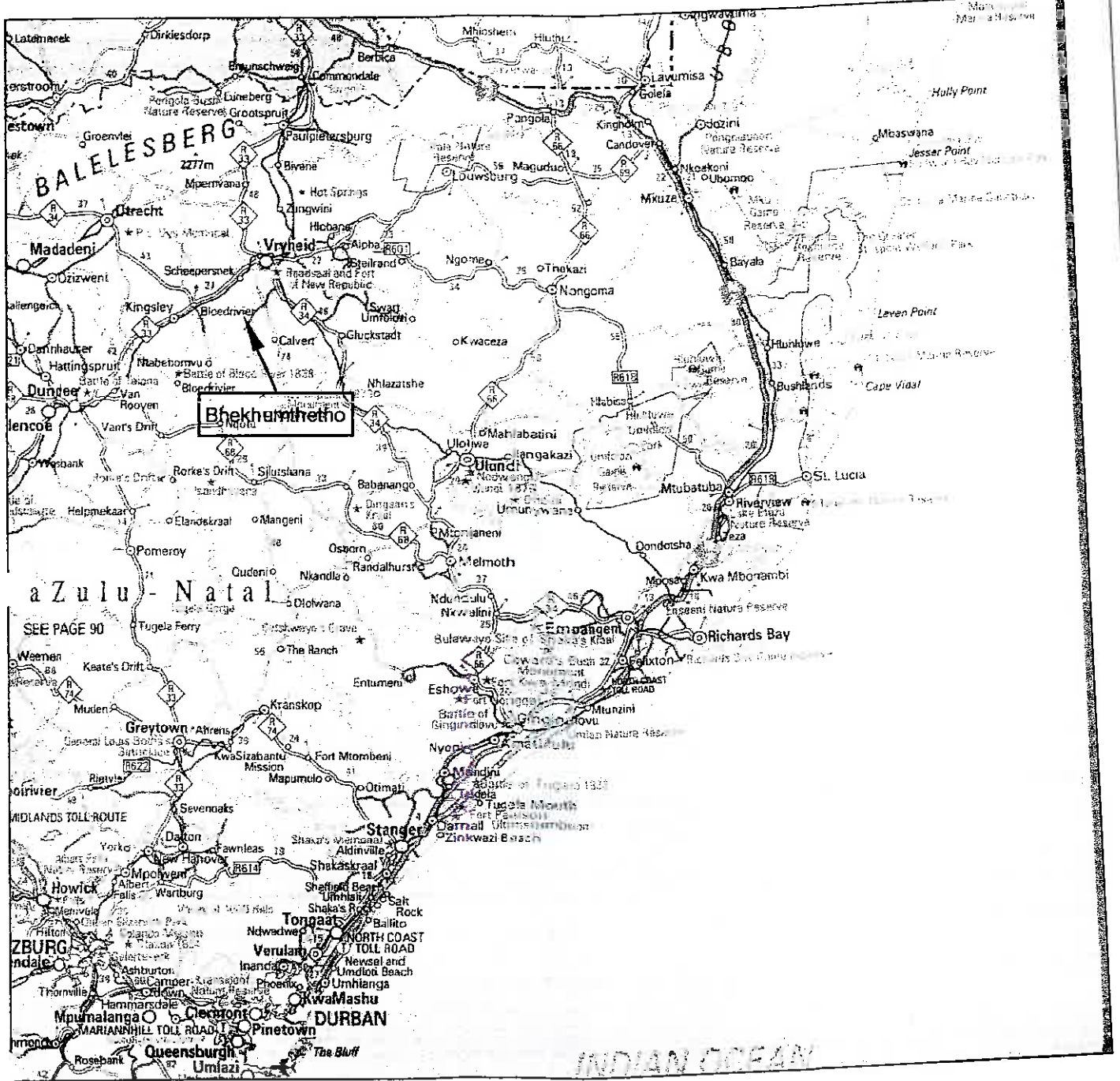
CONSULTING ENGINEERS

ERNST CLOETE AND ASSOCIATES

P O Box 2083, VRYHEID, 3100

161 High Street

Tel 0381-802825 Fax 0381-802945



Project		BHEKUMTHETHO WATER SUPPLY	
Client			
Consulting Engineers		ERNST CLOETE & ASSOCIATES	
LOCALITY PLAN		R O Box 2033	
ANNEXURE L		Vryheid 3100	
Amendments		161 High Street	
No	Date	Details	Tel 034-9832925
			Fax 034-983225
REVISIONS		Drawn by : R Erasmus	
		Approved :	
		Date : September 2001	
		Plan No : 00-97/2	

ANNEXURE M

BHEKUMTHEHO COMMUNITY WATER SUPPLY SCHEME: KN 124

DEPARTMENT OF WATER AFFAIRS AND FORESTRY

CONSULTING ENGINEERS

ZINUS COETJEE & ASSOCIATES cc

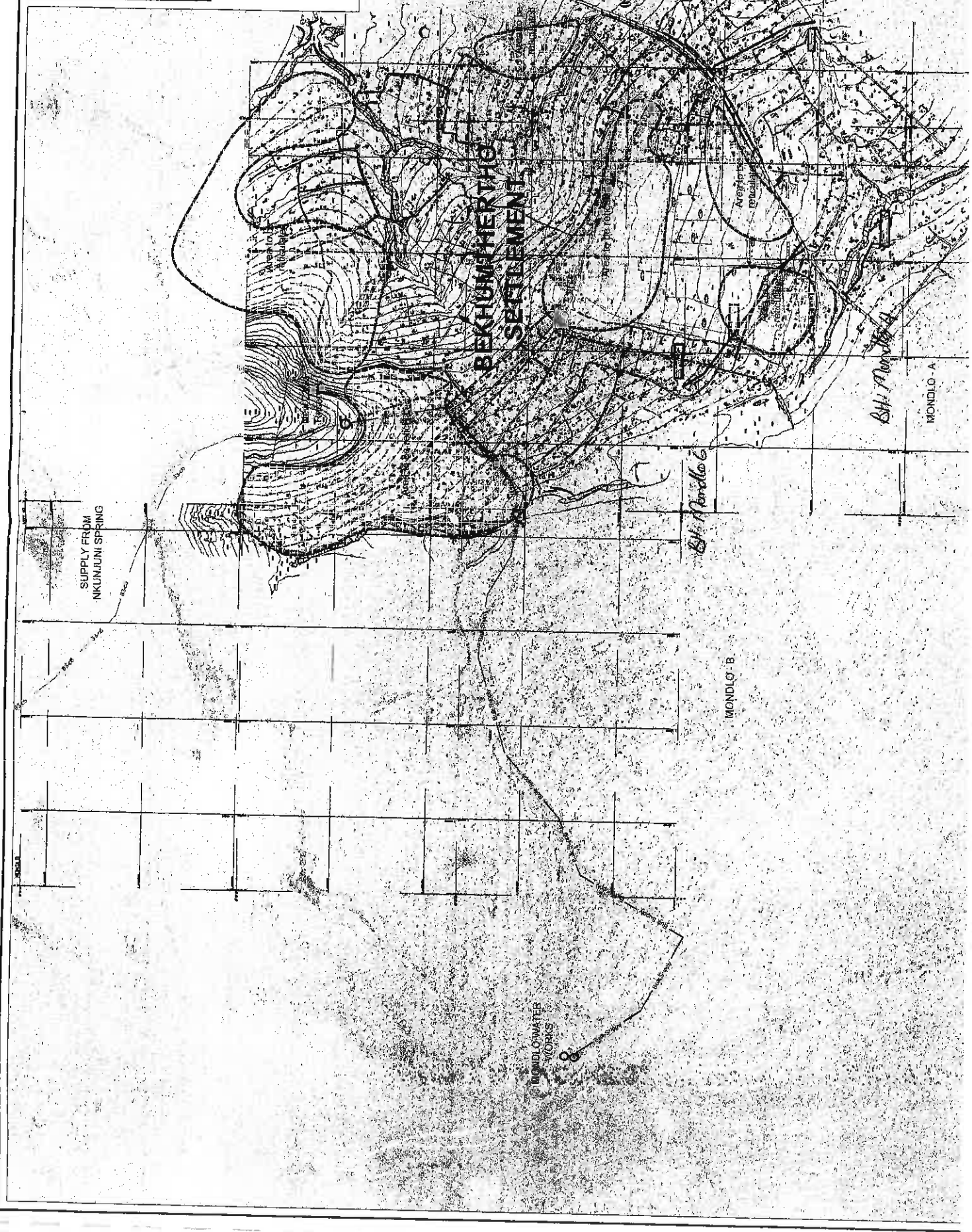
PO Box 492
 Vryheid 336
 0851 853265
 031 294 5234

Quantity: 1: EKO-2008
 Date: 2014/11/20
 Project No: A

1: 20 000 LAYOUT DRAWING

REVISIONS

No.	Description	Date
1		



RDP PROJECT MONTHLY REPORT

SHEET 2

BUSINESS PLAN SUMMARY

PLANNED EMPLOYMENT:

	No. of Persons:	No. of Days:
Total Employees:		
Women:		
Youth:		
Men:		

PLANNED TRAINING:

	No. of Persons:
Construction:	
Management & Admin:	
Operations & Maintenance:	

PLANNED COSTS:

Construction Cost:		No. of Contractors:	
Labour Cost:		Cost of Contractor:	
No. people to be served:		Cost per Capita:	
O&M Fund:			

CERTIFIED CORRECT:

Consulting Engineer

Implementing Agent

RDP PROJECT MONTHLY REPORT

SHEET 3

MANPOWER UTILIZATION

ACTUAL EMPLOYMENT:

	No. of Persons:	No. of Days:
Total Employees:		
Women:		
Youth:		
Men:		

ACTUAL TRAINING:

	No. of Persons:
Construction:	
Management & Admin:	
Operations & Maintenance:	

ACTUAL COSTS:

Construction Cost:	
Labour Cost:	
No. people served:	

PERMANENT EMPLOYMENT:

	No. of Persons:
Project Management:	
Project Administration:	
O&M Administration:	
Financial Management:	
Technical Management:	
Construction:	

LOCAL CONTRACTORS:

Name:	Contract Duration (Weeks):	Contract Cost:

CERTIFIED CORRECT:

Consulting Engineer

Implementing Agent

RDP PROJECT MONTHLY REPORT

SHEET 5

WATER PROJECT MILESTONES

MILESTONES:		Completion Dates (dd/mm/yy)			EV	Completion Costs	
Milestone Number	Milestone Description	Baseline	Revised	Actual	Point	Planned	Certified
-3	Planning consultant appointed						
-2	Water Service Provider (WSP) nominated						
-1	Feasibility study completed						
1	Project Steering Committee Selected						
2	Training needs/plan approved						
3	Implementing Agent Appointed						
4	O&M plan approved						
5	Environment Impact Assessment Complete						
6	Business Plan Approved by PSC						
7	Business Plan submitted to DWAF				X		
8	Business Plan Conditionally Approved						
9	Business Plan Approved by DWAF				X		
10	Business Area Plan Approved				X		
11	Project Consultants Appointed						
12	Designs Complete						
13	PSC Approval of Design						
14	Design Approved by IA/DWAF				X		
15	Tender Documents Completed & Tender Adv.						
16	Tenders Closed						
17	Contractor Appointed				X		
18	Project Management Procedures Established						
19	Start of Construction						
20	Water Source secured/Completed						
21	Primary Supply System (pumps/weirs)						
22	Purification Facilities Completed						
23	Storage Reservoirs Completed						
24	Distribution/Reticulation Completed						
25	Construction 100% Completed				X		
26	Closure Report submitted to DWAF						

CERTIFIED CORRECT:

 Consulting Engineer

 Implementing Agent

RDP PROJECT MONTHLY REPORT

SHEET 6

ISD MILESTONES WATER

MILESTONES:		Completion Dates (dd/mm/yy)			EV Point	Completion Costs	
Milestone Number	Milestone Description	Baseline	Revised	Actual		Planned	Certified
1	Social Consultant Appointed						
2	Training Agent Appointed						
3	Labour Desk Established						
4	Training Plan Finalised & Approved						
5	Start of Training						
6	Steering Committee Training Complete						
7	Contractor/Labour Training Complete						
8	Admin/Financial Training Complete						
9	Training Completed				X		

CERTIFIED CORRECT:

Consulting Engineer

Implementing Agent

RDP PROJECT MONTHLY REPORT

SHEET 7

O&M MILESTONES WATER

MILESTONES:		Completion Dates			EV	Completion Costs	
Milestone Number	Milestone Description	Baseline	Revised	Actual	Point	Planned	Certified
1	Operating Authority WSP Identified						
2	Transfer Plan Completed						
3	O&M & Tariff/Cost Recovery Plan Appr. by PSC						
4	Identification of manpower & Training Requirement						
5	Selection of Suitable Candidates						
6	O&M Training Complete						
7	O&M Administrative System in Place						
8	O&M Program in Place for Continuous Maint.						
9	O&M Fund Set Up				X		
10	Ongoing Institutional Responsibilities Approved						
11	Commissioning of Project				X		
12	Transfer (hand over) Project						
13	Asset Survey Completed				X		
14	Completion Certified				X		
15	Retention Paid						
16	O&M Mentoring Period Complete						
CERTIFIED CORRECT:							

Consulting Engineer

Implementing Agent

RDP PROJECT MONTHLY REPORT

SHEET 8

PROJECT KPI'S

ESTIMATE OF ADEQUACY OF WATER SOURCE:	
Demand (l/capita/day): <input type="text"/>	Supply (l/capita/day): <input type="text"/>
LEVEL OF POT. ENVIRONMENTAL IMPACT:	
Threat to Eco-systems (1-5): <input type="text"/>	Water Quality Impact (1-5): <input type="text"/>
LEVEL OF INTEGRATION WITH OTHER COMMUNITY ACTIVITIES:	
Overlap or Complementary Activities (1-5): <input type="text"/>	
CERTIFIED CORRECT: <input type="text"/>	

Consulting Engineer

Implementing Agent

RDP PROJECT MONTHLY REPORT

SHEET 9

ISD KPI'S

INVOLVEMENT OF APF, TLC AND PSC

Level of decision making at APF level (1-5)	<input type="text"/>
Level of decision making at TLC level (1-5)	<input type="text"/>
Level of decision making at PSC level (1-5)	<input type="text"/>

ACCEPTABILITY OF PSC

Level of representation of PSC (1-5)	<input type="text"/>
--------------------------------------	----------------------

HEALTH AWARENESS & PROMOTION PROGRAMME

No. of promotional meetings	<input type="text"/>
-----------------------------	----------------------

QUALITY OF TRAINING

Course content vs standards required (1-5)	<input type="text"/>
--	----------------------

GENERAL

Level of community awareness (1-5)	<input type="text"/>
Level of initiative & responsibility demonstrated by the community (1-5)	<input type="text"/>
Level of User Commitment to pay (1-5)	<input type="text"/>
Local Management Capacity (1-5)	<input type="text"/>

PEOPLE TRAINED TO DATE

Number of Courses	<input type="text"/>
Number of Women trained	<input type="text"/>
Number of Youth trained	<input type="text"/>
Number of Unemployed trained	<input type="text"/>

CERTIFIED CORRECT:

Consulting Engineer

Implementing Agent

RDP PROJECT MONTHLY REPORT

SHEET 10

WATER O&M KPIS

DELIVERY (PRE-DETERMINED):

Final Capacity (Ml/day)

Projected Consumption (l/capita/day)

DELIVERY (ACTUAL):

Current Delivery (Ml/day)

Actual Consumption (l/capita/day)

Volume Delivered (Ml/month)

ASSURANCE & RELIABILITY OF SUPPLY (PRE-DETERMINED):

Projected Supply from Source (Ml/day)

ASSURANCE & RELIABILITY OF SUPPLY (ACTUAL):

PostCommissioning supply interruptions (No./month)

Duration of Breaks (days)

Yield from Source (Ml/day)

WATER QUALITY

Quality Meets Potable Standard

O&M SUSTAINABILITY

O&M Cost per Family (% of average disposable monthly income)

Acceptability of Level of Service and Payment of O&M (1-5)

COST RECOVERY

Identification of Cost Recovery System (yes/no)

Total Income of Operating System (R)

Total Cost of Operating System (R)

Adequacy of Reserve Fund (No. of Months)

COST EFFECTIVENESS (PRE-DETERMINED):

Estimated Cost of Water Supplied (R/kl)

COST EFFECTIVENESS (ACTUAL):

Unit Cost of Water Supplied (R/kl)

Maintenance and Admin Cost (R/kl)

WATER LOSS MANAGEMENT

Water Loss (%)

CUSTOMER SATISFACTION

Result of Customer Surveys (1-5)

LEVEL OF POTENTIAL ENVIRONMENTAL IMPACT

Threat to eco-systems (1-5)

CERTIFIED CORRECT:

Consulting Engineer

Implementing Agent

Permission to Occupy : Bhekumtheto Tribal Area

I, who is the rightful and legal acting Inkosi of the Bhekumthetho Tribal Area, hereby confirm that I have reviewed the attached drawings and hereby grant official permission for the Engineer/s and Contractor/s to occupy the pipeline routes, reservoir sites, weir sites and offices block sites as shown.

I also confirm that there shall be no compensation required for occupation of the construction sites and the pipeline routes indicated.

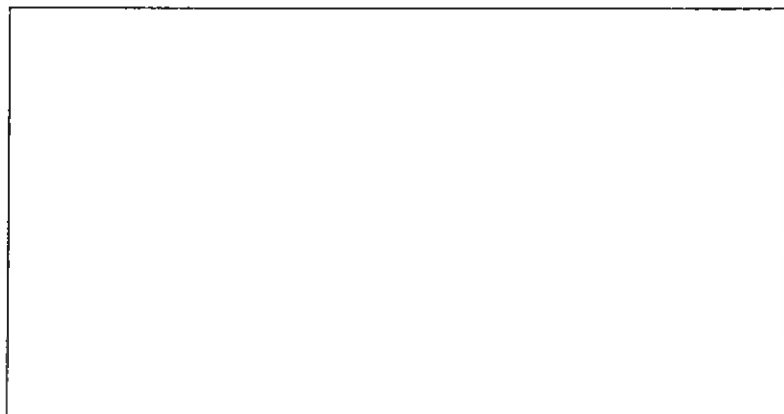
Signed on behalf of the Bhekumthetho Tribal Authority

MVA

Authorized Signature.....

Date

Tribal Stamp



(P.T.O. OBTAINED IN PHASE I AND II)

ZDME: 531
APPROVAL OF CBPWP BUSINESS PLAN: BUXEDENE
CLUSTER

Following much deliberation on this matter, it was

RESOLVED THAT:

- | | |
|--|-----|
| i) The Business Plan for the Buxedene CBPWP project be approved. | MTS |
| ii) Cllr. J B Mavundla be requested to report to the Nongoma Municipality on i) above. | MTS |

ZDME: 532
APPROVAL OF BUSINESS PLAN: BHEKUMTHETHO
WATER SUPPLY, KN 124

It was

RESOLVED THAT:

- | | |
|---|-----|
| i) The Business Plan be approved. | MTS |
| ii) The District Municipality accepts the responsibility for the assets and liabilities of the project. | MTS |
| iii) The Department of Water Affairs to finance the project from its identification up to its transfer to the Zululand District Municipality. | MTS |
| iv) The Zululand District Municipality be responsible for the O&M budget to operate the scheme after its practical completion. | MTS |
| v) The Zululand District Municipality as WSA be responsible for all deficits that occur on the scheme. | MTS |

ACTION

- vi) The Department of Water Affairs not to be held responsible for the funding or subsidisation of household connections.
- vii) The Business Plan be forwarded to DWAF for approval.
- viii) The cash flow be amended accordingly.

ACTION

MTS

MTS

MTS

ZDME: 533

APPROVAL OF BUSINESS PLAN: ISANGOYANE WATER SUPPLY, KN 125



It was

RESOLVED THAT:

- i) The Business Plan be approved.
- ii) The District Municipality accepts the responsibility for the assets and liabilities of the project.
- iii) The Department of Water Affairs to finance the project from its identification up to its transfer to the Zululand District Municipality.
- iv) The Zululand District Municipality be responsible for the O&M budget to operate the scheme after its practical completion.
- v) The Zululand District Municipality as WSA be responsible for all deficits that occur on the scheme.
- vi) The Department of Water Affairs not to be held responsible for the funding or subsidisation of household connections.

MTS

MTS

MTS

MTS

MTS

MTS

BUSINESS PLAN APPROVAL BY THE PSC

ANNEXURE R

We, the representatives of the Bhekumthetho Project Steering Committee, fully understand the layout and proposed execution of this project as described in this document.

The Chairman of the Bhekumthetho Project Steering Committee:

Name: SAKHAMUZI MISHALI

Signature: [Signature]

who shall for the purposes of this agreement be known as the Authorised Representative of the Bhekumthetho Project Steering Committee

Agreed to by the following Committee members:

Name	Signature	Capacity	Date
1. <u>SAKHAMUZI MISHALI</u>	<u>[Signature]</u>	Chairperson	<u>12/02/02</u>
2. <u>THULANI MAPHISA</u>	<u>[Signature]</u>	Vice-Chairperson	<u>12/02/02</u>
3. <u>NOMUSA MTHEMBU</u>	<u>[Signature]</u>	Secretary	<u>12/02/02</u>
4. <u>SONTO KHAYILE</u>	<u>[Signature]</u>	Treasurer	<u>12/02/02</u>
5. <u>Evelyn Nyathi Razi</u>	<u>[Signature]</u>	Member	<u>12/02/02</u>
6. <u>SIPHINE SHONGWE</u>	<u>[Signature]</u>	Member	<u>12/02/02</u>
7. <u>NKOSINATHIMTHEWHE</u>	<u>[Signature]</u>	Member	<u>12/02/02</u>
8. <u>Mlondisi Khumalo</u>	<u>[Signature]</u>	Member	<u>12/02/02</u>
9.	Member
10.	Member

The Representative of the Department of Water Affairs & Forestry :

Name: THULANI G. MNYANDU

Signature: [Signature]

The Zululand District Municipality Ward Councillor

Signature: [Signature]

Business Plan approved by : Zululand District Municipality

Signature: (Refer to annexure Q)

Capacity:

ANNEXURE 5

Department of Agriculture and Environmental Affairs

Departement van Landbou en Omgewingsake

Umnyango Wezolimo Nezemvelo



Private Bag:	X 9059	Telephone:		Telefax No.:	
Privaat Sak:	Pietermaritzburg	Telefoon:	033- 355 9100	Telefax Nr.:	033- 355 9614
Isikwama Sep	3200	Ucingo:		Isikhahamezi:	
Enquiries:		Date:	19 - 02 -2002	Reference No.:	EIA/2982
Navrae	Mrs C. Ramdeen	Datum:		Verwysing Nr:	
Imibuzo:		Usuku:		Inkomba:	

FAX NUMBER : 035 - 870 0735

NO. OF PAGES : 1

FOR ATTENTION : Zululand District Municipality
Andre Smit

Dear Sir/Madam

RE: Application to undertake a listed activity in terms of Section 22 of the Environment Conservation Act, Act No. 73 of 1989

The KwaZulu - Natal Department of Agriculture and Environmental Affairs hereby acknowledges receipt of your application, EIA/2982, for the Proposed Bhekumthetho Water Project, Othaka Tribal Authority Mondlo/Vryheid.

The Development proposed may not commence until such time as the Environmental Authorization has been issued by this Department.

Kindly quote the above-mentioned reference number in future correspondence.

Yours faithfully

Mr H.B. Strauss

Head of Department

KwaZulu-Natal Department of Agriculture & Environmental Affairs

Environmental Impact Management

A:/Receipt.wpd

cc Jaco van Rensburg, Ernst Cloete & Associates cc. Fax No. 034 - 983 2945

FEASIBILITY STUDY

**BHEKUMTHETHO WATER SUPPLY
KN 124
(Multi Annual Action Plan)**

DATE: April 2002

VERSION DATE: 18 April 2002

EMPLOYER:

UTHUNGULU DISTRICT MUNICIPALITY
PRIVATE BAG X1025
RICHARDSBAY
3900

TEL (035) 789 1404
FAX (035) 789 1409

CONSULTING ENGINEERS:

ERNST CLOETE AND ASSOCIATES cc
P.O.BOX 2083
VRYHEID
3100

TEL (034) 983 2825
FAX (034) 983 2945

1. INTRODUCTION

The project is located approximately 25 km south west of the town of Vryheid in the Abaqulusi Local Municipality area. The area is approximately 21 km².

Ward Name	Population	Households	Current Level of Water Service
1 Zama	1 360	160	Fully serviced metered household connections
2 Phumeceleni	1 070	116	Partially serviced metered household connections
3 Maria	2 845	275	Fully serviced metered household connections
4 Zwelisha	1 580	183	Partially serviced metered household connections
5 Madresini	1 345	153	Partially serviced metered household connections
TOTAL	8 200	887	
OTHAKA TRIBAL AUTHORITY			

2. OBJECTIVE

For ease of evaluation and comparison in the Business plan, the estimated capital cost of the community water supply scheme required to meet the 10-year demand was determined.

The objective of this feasibility study is to more accurately determine the full capital and operational and maintenance costs of all the components, and to thus determine the financial feasibility of the scheme in terms of affordability to both the funding agent and the communities.

3. FEASIBILITY STUDY

3.1 Demographics

Population growth estimate 0%
 (A population growth of 2.5% was previously used, but it is predicted that with the effects of HIV and aids the population growth will be as low as 0%)

Estimated Population in 2000 8 200
 Estimated Population in 2010 8 200

3.2 Water Demand

The following assumptions have been made in calculating the water demands:

Existing average daily demand low value 15 l/capita/day
 Existing average daily demand high value 25 l/capita/day
 Year 2010 average daily demand 25 l/capita/day

Community	Level of Supply	Population 2001	Households	2001 Demand Low Value (Existing) (kl/day)	2001 Demand High Value (Existing) (kl/day)	2010 Demand (10 Years) (kl/day)
Zama	Bulk & Reticulation	1360	160	20.4	34.0	34.0
Phumeceleni		1070	116	16.0	26.7	26.7
Maria		2845	275	42.7	71.2	71.2
Zwelisha		1580	183	23.7	39.5	39.5
Madresini		1345	153	20.2	33.6	33.6
Total		8200	887	123	205	205

3.3 Water Source

Presently the community obtains water from springs and streams. The proposed water sources to be used are summarised in the table below. This information has been confirmed by a geohydrological investigation done by Engeocon cc (Earth Science Consultants - See Annexure E).

Present Water Sources	Water Quantity available in kl/day	Approx. Present Reliability
Borehole eMondlo no 4	35	100%
Borehole eMondlo no 6	30	100%
Spring	21	60%
Mondlo Water Works	150 kl	100%

It is important to note that all of the above mentioned sources will be available to the whole network.

It is also proposed to utilise water from the existing eMondlo Water Works and reticulate to the existing and proposed reservoirs at Bhukumthetho. The issue of drawing (bulk) water from the Mondlo Water Works has been a sensitive matter although all roleplayers have now agreed to this proposal. The required draw of 150 kl/day is available on the following derived monthly data.

Mondlo Water Works capacity - 8 MI/day
 Draw off to Bhekumthetho - 0.15 MI = 1.87% of the capacity

The information in this table was obtained from the SSA – Bateman (Mr Koos Nel).

Month	Average Daily Purified Water Produced (MI)	Percentage Load (%)	Average Daily Township Consumption (MI)	Balance (MI/day) : (Plant Capacity – Consumption)	Average Water level in reservoirs (%)
Jul-01	6.161	77.0%	6.161	1.839	60%
Aug-01	6.876	86.0%	6.747	1.253	70.0%
Sep-01	No data	No data	No data	No data	No data
Oct-01	6.603	82.5%	6.603	1.397	71.0%
Nov-01	6.825	85.3%	6.825	1.175	71.0%
Dec-01	8.453	105.7%	8.453	-0.453	73.5%
Jan-02	7.537	94.2%	7.537	0.463	73.0%
Feb-02	7.471	93.4%	7.471	0.529	75.0%
Mar-02	7.837	98.0%	7.837	0.163	74.0%
AVERAGES	7.220	90.25%	7.204	0.796	70.9%

Thus based on the information obtained from this table, a supply of 150kl/day to Bhekumthetho should be available. On the other hand, the status quo of the Mondlo Water Scheme is not as desired.

The scheme is problematic in the sense that it requires constant repairs. The Zululand District Municipality has prepared a Works Transfer Business Plan that identifies refurbishment costs of R850 000.00. It is anticipated that the transfer will take place towards middle 2002 followed by the refurbishment process.

The issue of water abuse in Mondlo Town is also currently under review by the Abaqulusi Municipality. CMIP has funded the upgrading of services in Mondlo, which includes the installation of metered household connections. This upgrading and the re-registration of water consumers in Mondlo Town is anticipated to have a significant reduction in water consumption. This would imply a significant reduction in the daily production of the Mondlo Water Works.

Total demand = 205kl/day (25l/p/d)

Yield available = 235kl/day

3.4 Design Parameters

Pipelines have been sized based on a projected average demand up to year 2010 (10 Year design horizon) and flow calculated using a 2,5 peak factor.

Pumps and Pump Stations have been sized for a 10-year design horizon again using a 1,5-peak factor.

Pump delivery mains will be metered.

Reservoir capacity = 54 hours (25l/c/day)

In terms of phasing the construction of reservoirs a 10-year design horizon is proposed (48 hours AADD storage).

All reservoir inlet pipe work will be "top entry". Reservoir outlets will be metered.

3.5 Scope of Work and Details

The various components of this scheme are described below. A layout plan indicating the components of the Bhekumthetho Water Supply Scheme is given in Annexure D. A cost breakdown was done in Annexure A & B (Capital Cost) and Annexure C (Maintenance costs).

The planned scope of work will consist of the following:

- Construction of bulk water supply and reticulation
 - Connection at existing eMondlo water works
 - Gravity fed bulk supply line to Bhekumthetho
 - 1 x 225kl reservoir
 - The extension of existing reticulation system
 - Repair and upgrading of existing borehole pump stations
 - Spring protection
 - Payment Office
- A complete ISD exercise for the project along the DWAF Guidelines.
- A one-year operation, maintenance and mentoring period.
- Transfer of project to the WSA.

3.6 Cost Estimates.

Description	Capital Costs (incl. VAT)	Total Costs (incl. VAT)
Utilising all sustainable water sources	R 2 233 484.20	R 3 100 000.00
Cost per Capita	R 272.38	R 378.05

3.7 Operating and Maintenance

The Bhekumthetho Water Service Provider will manage the bulk and reticulation supply.

Details of the operating and maintenance costs of the works comprising this project is given in Annexure E. A summary of the operating and maintenance costs is as follows:

Supply from all sustainable sources	R 5.14 /kl
Tariff set by Water Service Authority	R 4.00 /kl
Subsidised by WSA	R 1.14 /kl

4. CONCLUSION

The average household income for the Bhekumthetho area is approximately R200 – R400 / month / household.

In terms of tariff affordability the rate of R4.00 per kilolitre for this community translates to approximately R 25.00 per month per household for potable water (25l/p/d). This is considered affordable and feasible. (2.5 - 5% of the average household income).

The capital cost per capita for this scheme is R 378 / capita, which is acceptable when compared to the health and hygiene benefits.

The most economical scheme is a **combination of water from springs and bulk water supply** with reticulation network at a total cost of R 3 100 000.00

ANNEXURE A

Bhekumthetho Water Supply :
(Including Bulk Water Supply)

Total Cost Estimate
All figures include 14% VAT

KN 124

		Totals	Percentage
1 PIPING		R 339 363.48	10.9%
2 LABOUR - (Trenching, Pipelaying & Backfilling)		R 308 250.00	9.9%
3 RESERVOIRS AND WEIRS		R 404 759.00	13.1%
4 BULK RETICULATION		R 850 769.00	27.4%
5 TOOLS FOR LABOUR FORCE		R 13 680.00	0.4%
6 PAYMENT OFFICE		R 148 200.00	R0.05
7 PUMPSTATIONS - UPGRADE		R 39 900.00	1.3%
8 FENCING		R 27 360.00	0.9%
9 CHLORINATORS		R 19 950.00	0.6%
10 CONTINGENCIES		R 41 252.72	1.3%
11 ESCALATION		R 40 000.00	1.3%
12 TOTAL CAPITAL COST	Sub Total : Project Costs	R 2 233 484.20	72.0%
13 BUSINESS PLAN FEES		R 79 230.00	2.6%
14 IMPLEMENTING AGENT FEES		R 61 270.14	2.0%
15 CAPACITY BUILDING AND TRAINING		R 191 496.19	6.2%
16 PROFESSIONAL FEES		R 337 187.79	10.9%
	For the first R 700 000.00 12.50%	R 87 500.00	
	Above R 700 000.00 10.00%	R 153 348.42	
	Sub Total	R 240 848.42	
	Factor for water in rural areas 1.40	R 337 187.79	
(as per Appendix B1 Form of Agreement for Consulting Services January 2000)			
17 OPERATION AND MAINTENANCE - (Training & Assitance during TTP period)		R 30 000.00	1.0%
18 TECHNICAL TRAINING & SUPERVISION		R 76 587.68	2.5%
19 COMMUNITY REPRESENTATIVE REIMBURSEMENTS		R 10 944.00	0.4%
PSC Representatives			
20 ONGOING MONITORING & EVALUATION (During TTP)		R 79 800.00	2.6%
TOTAL PROJECT COST		R 3 100 000.00	
TOTAL POPULATION SERVED		8 200	
TOTAL COST PER CAPITA		R 378.05	

ANNEXURE B

Bhekumthetho Water Supply : Detailed Project Cost Estimate
All figures include 14% VAT

KN 124

No:	Description	Amount	Rate	SUB TOTAL	TOTAL
1	PIPING				R 339 363.48
1.1	80 x 3.5 mm Klambon Piping	250 m	R 72.85	R 18 211.50	
1.2	80mm Klambon Fittings	42 No	R 30.44	R 1 278.40	
1.3	50 x 2.9 mm Klambon Piping	800 m	R 37.73	R 30 187.20	
1.4	50mm Klambon Fittings	134 No	R 18.70	R 2 505.26	
1.5	90mm Class 6 HDPE (50mRolls)	3 000 m	R 20.86	R 62 586.00	
1.6	90mm Pipe Fittings	62 No	R 184.68	R 11 450.16	
1.7	75mm Class 6 HDPE (50mRolls)	1 000 m	R 14.48	R 14 478.00	
1.8	75mm Pipe Fittings	22 No	R 126.94	R 2 792.66	
1.9	63mm Class 6 HDPE (100mRolls)	6 000 m	R 10.26	R 61 560.00	
1.10	63mm Pipe Fittings	62 No	R 75.13	R 4 657.81	
1.11	50mm Class 10 HDPE (100mRolls)	6 500 m	R 7.75	R 50 388.00	
1.12	50mm Pipe Fittings	67 No	R 53.01	R 3 551.67	
1.13	50mm Class 6 HDPE (100mRolls)	3 000 m	R 6.44	R 19 323.00	
1.14	50mm Pipe Fittings	32 No	R 53.01	R 1 696.32	
1.17	Additional Fittings to above	1.0 sum	R 54 697.50	R 54 697.50	
2	LABOUR - (Trenching, Pipelaying & Backfilling)				R 308 250.00
2.1	Excavations	20 550 m	R 5.50	R 113 025.00	
2.2	Backfill	20 550 m	R 5.50	R 113 025.00	
2.3	Testing	20 550 m	R 3.00	R 61 650.00	
2.4	Piplaying (Transport on site)	20 550 m	R 1.00	R 20 550.00	
3	RESERVOIRS AND WEIRS				R 404 759.00
3.1	225kl Reservoir	1 No	R 193 800.00	R 193 800.00	
3.2	Contractors P&G's	1 sum	R 35 000.00	R 35 000.00	
3.3	Fittings to 225kl Res.	5 No	R 13 965.00	R 69 825.00	
3.4	Float valves	1 No	R 3 534.00	R 3 534.00	
3.5	Spring Protection (Weir)	1 No	R 51 300.00	R 51 300.00	
3.6	Pipe fittings to weir	1 No	R 17 100.00	R 17 100.00	
3.7	Steel piping Anchor blocks	100 No	R 342.00	R 34 200.00	
4	BULK RETICULATION				R 850 769.00
4.1	Contractors P&G's	1 sum	R 85 500.00	R 85 500.00	
4.2	160 mm OD Cl.6 uPVC Piping	300 m	R 39.90	R 11 970.00	
4.3	160 mm OD Cl.9 uPVC Piping	2050 m	R 57.00	R 116 850.00	
4.4	160 mm OD Cl.12 uPVC Piping	1150 m	R 68.40	R 78 660.00	
4.5	110 mm OD Cl.6 uPVC Piping	600 m	R 21.09	R 12 654.00	
4.6	Earthworks - Excavations	4100 m	R 62.70	R 257 070.00	
4.7	Pipe Bedding	820 m ³	R 80.00	R 65 600.00	
4.8	Earthworks - Backfilling	4100 m	R 30.00	R 123 000.00	
4.9	Donga & Road crossings	4 No	R 11 400.00	R 45 600.00	
4.10	General Fittings	1 sum	R 36 765.00	R 36 765.00	
4.11	Connection at purification works	1 sum	R 17 100.00	R 17 100.00	
5	TOOLS FOR LABOUR FORCE				R 13 680.00
5.1	Picks, Spades etc.	1 No	R 13 680.00	R 13 680.00	
6	PAYMENT OFFICE				R 148 200.00
6.1	Payment Office	1 No	R 148 200.00	R 148 200.00	
7	PUMPSTATIONS - UPGRADE				R 39 900.00
7.1	Service Lister Engines & BH Pumps	2 No	R 17 100.00	R 34 200.00	
7.2	Paint Security Cages	2 Sum	R 2 850.00	R 5 700.00	
8	FENCING				R 27 360.00
8.1	To Pump station and Spring	2 No	R 13 680.00	R 27 360.00	
9	CHLORINATORS				R 19 950.00
9.1	To reservoirs	5 No	R 3 990.00	R 19 950.00	
				Sub Total	R 2 152 231.48

INCOME AND EXPENDITURE FOR A FIVE YEAR PERIOD - BHEKUMTHETHO

ANNEXURE C

KN 124

Estimated Cost/month		Year 1	Year 2	Year 3	Year 4	Year 5
Operating Costs (Ongoing normal costs)						
WSP Costs						
Diesel	Fixed Consumption	R 600 R 24 000	R 648 R 25 920	R 700 R 27 994	R 756 R 30 233	R 816 R 32 652
Bulk Water	Payable to KZ 263	R 3 850	R 56 940	R 97 528	R 113 004	R 127 020
Wages	Maintenance officers	R 1 200	R 15 552	R 16 796	R 18 140	R 19 591
	Office Worker	R 600	R 7 776	R 8 398	R 9 070	R 9 796
	Temporary Workers	R 2 000	R 2 592	R 2 799	R 3 023	R 3 265
Chlorination		R 2 400	R 7 776	R 8 398	R 9 070	R 9 796
Materials	Maintenance	R 2 000	R 2 592	R 2 799	R 3 023	R 3 265
Pump	Maint. & Replacement	R 450	R 5 832	R 6 299	R 6 802	R 7 347
Transport	Public Transport	R 1 200	R 1 296	R 1 400	R 1 512	R 1 633
Consumables		R 600	R 648	R 700	R 756	R 816
Total WSP Expenditure		R 122 340	R 152 757	R 173 811	R 195 389	R 215 996
Income	New users / Exist Users					
	Total Users	600 households	150 households	85 households	25 households	10 households
	Consumption/month	600 households 3340 kl	750 households 3375 kl	835 households 4008 kl	860 households 4644 kl	870 households 5220 kl
	% Non payments	15%	15%	15%	15%	15%
	Recommended Tariff (R/kl)	R4.00	R4.20	R4.20	R4.50	R4.50
	Usages/ Family(/day)	130	160	160	180	200
	Actual Cost/ kl	R4.36	R 3.77	R 3.61	R 3.51	R 3.45
Total WSP Income		R 95 472	R 137 700	R 171 703	R 213 160	R 239 598
Net Profit/Loss (Operating Deficit)		-R 26 868	-R 15 057	-R 2 108	R 17 770	R 23 602

Assumptions: 8% Escalation per annum on expenditure
 Unit cost of water = R4.25/kl with 8% increase per annum
 Water consumption = 90 litres/household/day (10 litres/person/day)

	Year 1	Year 2	Year 3	Year 4	Year 5
WSA Support (SSA)					
Water Testing	R 9 600	R 10 368	R 11 197	R 12 093	R 13 061
Monitor and Evaluations	R 9 600	R 10 368	R 11 197	R 12 093	R 13 061
Financial Inspections and Audits	R 9 600	R 10 368	R 11 197	R 12 093	R 13 061
Technical Routine Inspections	R 9 600	R 10 368	R 11 197	R 12 093	R 13 061
Net Loss (Operating Deficit)	R 38 400	R 41 472	R 44 790	R 48 373	R 52 243

Assumptions: 8% Escalation per annum on expenditure

BHEKUMTHETHO COMMUNITY WATER SUPPLY SCHEME, KN 124

DEPARTMENT OF WATER AFFAIRS AND FORESTRY

1: 20 000 LAYOUT DRAWING

ERNSY CLOETE & ASSOCIATES B.
Consulting Engineers

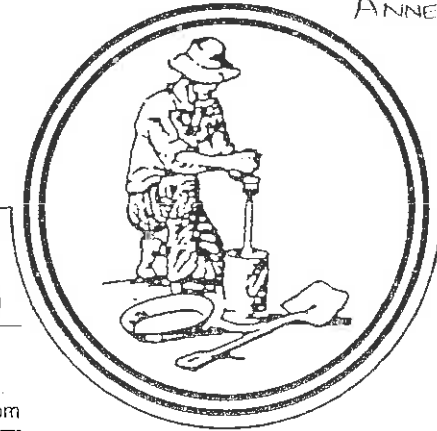
1001 Bona Vista
Private Bag 3100
141 Upper Deck
Tulisa 4012
Drawn by: H. H. JAMES
Checked by: []
Date: January 2003
Page No: []



ENGECON cc

Earth Science Consultants
Aardwetenskaplikes
Reg. No. CK 95/08669/23

ANNEXURE E



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Witbank 1035

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18 April 2002

Ernst Cloete & Associates
P.O. Box 2083
Vryheid
3100

Attention : Mr. Jaco Van Rensburg

RE :BHEKUMTHETHO WATER SUPPLY-GEOHYDROLOGICAL REPORT

Dear Sir,

The groundwater potential, aquifer type and source location form the basis of this report.

A few springs are seen throughout the project area, ranging from seasonal (short term springs associated with rainfall events) to perennial (springs that flow throughout most part of the year and are the result of geological/geohydrological factors). The best method for determining the sustainability of a spring would be the monitoring of the source throughout the year. This would be an ideal scenario, but practically almost impossible. Therefore, in order to determine the sustainability of the springs, geological and geohydrological characteristics are considered for the aquifer in which the springs are located. The geology type on a regional as well as local scale, the size of the catchment, flow rate, and water quality are the factors that could be useful in determining the long term sustainability of the spring. A detailed geological description of the formations encountered during the site visit is beyond the scope of the deskstudy. However, a short description of the surrounding geology, yield potential and sustainability of the spring will be discussed below.

The long term yield potential of the boreholes in the project area will be based on historic data consisting of test pumping results and recommendations as well as water quality results.

Geology/Geohydrology of Spring

Spring 1 (Nkunjeni Mountain):

Geology: The spring is situated in the Nkunjeni Mountain to the North West of Mondlo town. The spring originates at the base of large dolerite sill, on the contact with the surrounding geology (mainly shales and sandstones). Shales and especially sandstones are capable of storing large volumes of groundwater. The baked and brittle contact zone of the dolerite sill (younger igneous intrusion) with the shales (older sedimentary formation), causes the spring. The dolerite sill is highly weathered at the position of the spring and consists of mainly boulders and claye topsoil. This weathered, jointed and fractured characteristic of the sill causes precipitation to filter down through the sill and into the coarse grained sandstone which serves as a very good aquifer.

Sustainability: A large catchment area was noted for the spring and it is believed that the yield obtained through flow measurement (v-notch method) in January 2002 and again for this investigation, at the end March, indicate that a flow reduction of approximately 40% can be anticipated for the low flow period in winter. See the details below:

Measured Yield	:	1440 l/hour (January 2002)
Measured Yield	:	1150 l/hour (March 2002)
Anticipated Yield	:	864 l/hour (Anticipated for winter months-low flow period)

Point of measure
S 27° 56' 30"
E 30° 42' 05"

Boreholes

The other sources to be utilized in the Bhekumthetho water supply scheme are two boreholes namely, Mondlo 4 and Mondlo 6. These two boreholes have been in production for the last two years with no apparent change in either the yield obtained or the water quality. This in light of the de-watering of several other boreholes in the area. It is believed that the current recommended yields for these boreholes are sufficient to supply the areas as proposed. Results for the testing of the boreholes as well as the recommended abstraction rates were obtained from the testing contractor: *Colloty Broers Irrigation*.

Borehole Mondlo 4 :

Available information: **Yield** -The borehole is drilled in the shale environment, probably into the contact (fracture) zone with a dolerite dyke. The test pumping analysis indicate a good yielding borehole with a recommended abstraction rate of 3500 l/hour. The borehole has been in production for the last two years. The following information was obtained:

Position	
S 27° 58' 55"	
E 30° 43' 50"	
Borehole depth	: 28m
Static water level	: 4,5m

Installation depth : 26m
Recommended Yield : 3500 l/hour

Water Quality -The water quality analysis was done by *Mhlatuze Water Laboratory* and all the elements are within acceptable range except for Iron, which could be due to either the equipment used by the testing contractor, or the fact that we often encounter elevated levels of Iron in a sandstone/shale environment due to the minerals associated with these geological formations. There are no health effects related to this amount of iron.

Borehole Mondlo 6 :

Available information: **Yield** -The borehole was drilled in the same shale environment, probably into the contact (fracture) zone with a dolerite dyke. The test pumping analysis indicate a good yielding borehole with a recommended abstraction rate of 3000 l/hour. The borehole has also been in production for the last two years. The following information relating to the borehole was obtained:

Position
S 27° 58' 37"
E 30° 43' 21"
Borehole depth : 70m
Static water level : 8m
Installation depth : 65m
Recommended Yield : 3000 l/hour

Water Quality -The water quality analysis was done by *Mhlatuze Water Laboratory* and the water is of good quality. The Calcium and Manganese values are slightly elevated, but still within acceptable range. No health related effects are associated with these levels, but some aesthetic effects such as scaling and staining may occur.

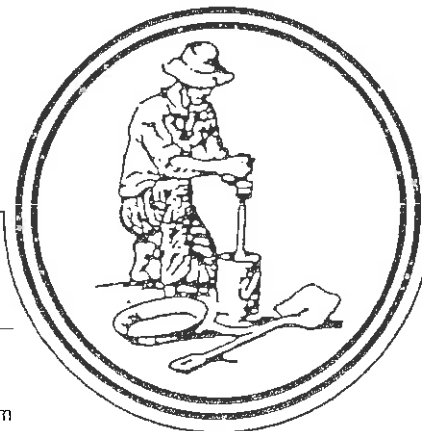
Conclusions

According to the measured yields obtained during this investigation, the magnitude of the catchment, sustainability and geology surrounding the spring source, it seems that the establishment of protection and use of the spring as a production source is feasible. It is however recommended that the spring's flow be measured on a regular basis throughout both the wet and dry season to better define its flow, the effect of rainfall and the time of recharge after a rainfall event after installation.

The two boreholes have been in production for the past two years and have shown no signs of de-watering. However, during the time of operation of these two boreholes, there has been no severe drought in the region. In the event of such a drought, abstraction from these boreholes might have a de-watering effect on the aquifer which in turn could result in damage to the boreholes and the aquifer. Therefore it is recommended that a monitoring facility be installed for each borehole in order to note and regulate abstraction from these sources.

ENGEOCOON cc

Earth Science Consultants
Aardwetenskaplikes
Reg. No. CK 95/08669/23



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18 April 2002

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Position
S 27° 58' 37"
E 30° 43' 21"
Borehole depth : 70m
Static water level : 8m
Installation depth : 65m
Recommended Yield : 3000 l/hour

Water Quality -The water quality analysis was done by *Mhlatuze Water Laboratory* and the water is of good quality. The Calcium and Manganese values are slightly elevated, but still within acceptable range. No health related effects are associated with these levels, but some aesthetic effects such as scaling and staining may occur.

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WATER SUPPLY AND SANITATION PROGRAMME

WORKS TRANSFER BUSINESS PLAN

PROVINCE : KwaZulu-Natal

WSA/s : DC 26 - Zululand

IMPLEMENTING AGENT :

PROJECT NAME : Transfer of Works to Zululand DC 26

PROJECT NUMBER/S : KN 269
KN 278
KN 279
KN 292
KN 293
KN 294
KN 302
KN 304
KN 309
KN 310

DATE : November 2001

PREPARED BY : Zululand District Municipality
035-870 0812 (telephone)
035-870 0735 (fax)

Private Bag x76, Ulundi, 3838
SC Building, Princess Street, Ulundi, 3838

Appendix M: Support information in relation to Cost Estimates

The total project cost as relating to the Mondlo Water Purification Works portion of transfer is given below, **including VAT**. The figure is to make allowance for escalation, fees, labour, materials, capacity building and training, ongoing monitoring & evaluation and contingencies.

STAGE 1

Refurbishment

Comment on the condition of works i.t.o refurbishment requirements and a description of the requirements:

Condition: *Functional – extreme refurbishment > R500k*

Inlet tower valves, pumpstation delivery manifold, highlift pumpsets, replacement of rising main VJ couplings, air valve replacement, reinstatement of clarifier desludging system & launders, meter recording reinstatement, refurbish dosing arrangement, general building repairs, switchgear repair

Action/ Decision:

It must be noted that this is a first order estimate and more detailed investigation would be required to determine the optimal implementation programme for such work. The refurbishment cost estimates above is not based on detailed investigation or firm prices.

The priority level:

Essential but must happen in short term

Refurbishment Cost Estimate

Total Refurbishment Cost: R850 000.00 (based on estimates provided by Bigen Africa as at August 2001)

The total refurbishment cost, includes VAT. The figure makes allowance for all costs including escalation, professional fees, labour, materials, and contingencies.

Land

The total cost, including VAT making allowance for all costs including escalation & professional fees for land transfer survey, servitude costs, expropriation and contingencies etc, is : R54 178.50

Description	Amount
Preparation of hand plans	R 12 000-00
Land surveying	R 17 775-00
Preparation of Land Transfer Agreements	R 5 000-00
Conveyancing	R 10 000-00
Co-ordination of land transfer	R 2 750-00
<i>Sub-total</i>	<i>R 47 525-00</i>
VAT	R 6 653-50
TOTAL	R 54 178-50

Analysis Report

05 February 2002

Requested By: Ernest, Truter & Assoc

Sample Ref. No. 65834

Sample Type Spring Water

Sampled Date: 01/02/2002

Order Number Louis

Received Date: 01/02/2002

Description: Ngujine 01 top spring

Attention: J van Rensburg

SABS 241-1999 Specification
for drinking water

Component	Result Value	Units	Class 1	Class 2
			Acceptable	Maximum Allowable
Turbidity (NTU)	7.2	NTU	1	10
Colour (Pt/Co)	55	Hazen	20	50
Electrical conductivity (mS/m)	14.3	mS/m	150	370
pH at 25 degrees Celsius	7.48		5.0 - 9.5	4.0 - 10.0
Chloride as Cl	3.8	mg/L	200	600
Nitrate as N	0.11	mg/L	10	20
Sulphate as SO ₄	1.1	mg/L	400	600
Fluoride as F	<0.13	mg/L	1.0	1.5
Total hardness as CaCO ₃	58	mg/L		
Iron as Fe	0.21	mg/L	0.20	2.0
Magnesium as Mg	8.4	mg/L	70	100
Manganese as Mn	0.003	mg/L	0.10	1.0
Potassium as K	0.2	mg/L	50	100
Sodium as Na	7	mg/L	200	400
Calcium as Ca	9.4	mg/L	150	300
Total alkalinity as CaCO ₃	66	mg/L		
Total dissolved solids	81.5	mg/L		

T. M. Pheasant
Analyst

A. S. S. S.
Checked By (Lab. Chemist)

M. S. S.
Authorised By

Analysis Report

05 February 2002

Requested By: Ernest, Truter & Assoc

Sample Ref. No. 65835

Sample Type Borehole Water

Sampled Date: 01/02/2002

Order Number Louis

Received Date: 01/02/2002

Description: Mondlo 6

Attention: J van Rensburg

SABS 241-1999 Specification
for drinking water

Component	Result Value	Units	Class 1	Class 2
			Acceptable	Maximum Allowable
Turbidity (NTU)	4.4	NTU	1	10
Colour (Pt/Co)	30	Hazen	20	50
Electrical conductivity (mS/m)	48.3	mS/m	150	370
pH at 25 degrees Celsius	7.71		5.0 - 9.5	4.0 - 10.0
Chloride as Cl	26.9	mg/L	200	600
Nitrate as N	<0.1	mg/L	10	20
Sulphate as SO4	13.5	mg/L	400	600
Fluoride as F	<0.13	mg/L	1.0	1.5
Total hardness as CaCO3	142	mg/L		
Iron as Fe	<0.07	mg/L	0.20	2.0
Magnesium as Mg	9.5	mg/L	70	100
Manganese as Mn	0.350	mg/L	0.10	1.0
Potassium as K	1.5	mg/L	50	100
Sodium as Na	37	mg/L	200	400
Calcium as Ca	41.4	mg/L	150	300
Total alkalinity as CaCO3	176	mg/L		
Total dissolved solids	275.3	mg/L		

T. M. Pheasant
Analyst

[Signature]
Checked By (Lab/Chemist)

[Signature]
Authorised By