

10556

LOAN AGREEMENT

in respect of

KLERKSDORP/JOUBERTON SEWAGE TREATMENT WORKS, PHASE 2

Entered into by and between






SOUTHERN DISTRICT COUNCIL

and

THE DEVELOPMENT BANK OF SOUTHERN AFRICA LIMITED





*T. 2-M. [Signature]*  
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*fel*

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T. Z. M.   
    


## SUMMARY

1. LOAN AMOUNT : R13,360,746
2. LOAN PERIOD : 20 years
3. INTEREST RATE : 15 per centum per annum
4. GRACE PERIOD FOR  
CAPITAL REPAYMENT : Nil
5. CAPITALISATION OF INTEREST: Nil
6. CAPITAL REPAYMENT AND  
PAYMENT OF INTEREST : 40 equal six-monthly instalments,  
commencing on the last day of the 1<sup>st</sup>  
Half-year after the Half-year during  
which the first disbursement was  
advanced to the Borrower.
7. PROJECT FILE NO. : NW10556

T. 2-M.   
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JH   
SEL 

MEMORANDUM OF LOAN AGREEMENT

in respect of

KLERKSDORP/JOUBERTON SEWAGE TREATMENT WORKS, PHASE 2

Entered into by and between

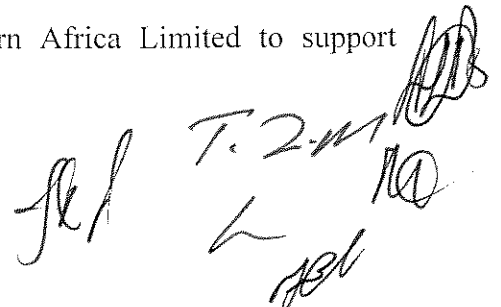
SOUTHERN DISTRICT COUNCIL

and

THE DEVELOPMENT BANK OF SOUTHERN AFRICA LIMITED

In fulfillment of the role of the Development Bank of Southern Africa Limited to support development in Southern Africa, it is hereby agreed as follows:


23/06/97  
{legal}[word]<NW10556>




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**1. DEFINITIONS AND HEADINGS**

1.1 In this agreement, unless the contrary appears from the context, the following words have the meanings as stated -

- 1.1.1 "Borrower" Southern District Council;
- 1.1.2 "DBSA" the Development Bank of Southern Africa Limited, reconstituted and incorporated in terms of Section 2 of the Development Bank of Southern Africa Act No. 13 of 1997;
- 1.1.3 "Parties" the Borrower and DBSA;
- 1.1.4 "Project" Klerksdorp/Jouberton Sewage Treatment Works, Phase 2, as described in more detail in Annexure A attached hereto;
- 1.1.5 "Loan" the financing granted to the Borrower in terms of clause 3;
- 1.1.6 "On-Lending" the transfer of any amounts by the Borrower to third parties out of the proceeds of the Loan, excluding payments for the procurement of goods and services;
- 1.1.7 "Project Agent" a person nominated in writing by the Borrower to act on its behalf in respect of the Project;
- 1.1.8 "Half-year" from the first day of April to the 30th day of September and/or from the first day of October to the 31st day of March during the next calendar year.

T. Z. M. 

- 1.2 Headings to the clauses of this agreement, the table of contents and summary are for reference purposes only and do not form part of this agreement.

## 2. PROJECT CO-OPERATION

- 2.1 To ensure that the purposes of the Loan are accomplished the Parties shall:

- 2.1.1 periodically and at the request of either Party:

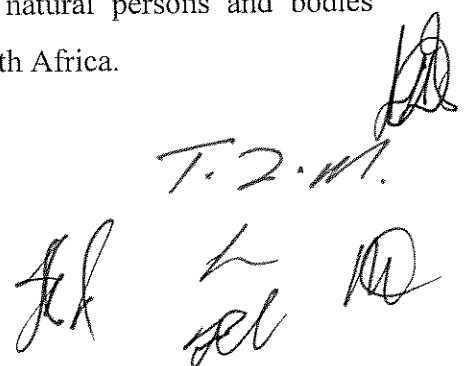
2.1.1.1 exchange views with regard to the progress of the Project, the benefits derived therefrom and the performance of their respective obligations under this agreement as well as other matters relating to the purposes of the Loan; and

2.1.1.2 furnish each other with all such information as may be reasonably requested with regard to the progress of the Project, the benefits derived therefrom and the general status of the Loan;

2.1.2 promptly inform each other of any fact which interferes with, or threatens to interfere with, the progress of the Project, the accomplishment of the purposes of the Loan, any related matter, and in particular the performance by either Party of its obligations under this agreement;

2.1.3 jointly determine the technical, financial and organisational requirements in respect of planning, management and control of the Project in order to ensure the efficient and effective execution and maintenance of the Project and related matters; and

2.1.4 jointly determine the criteria to be taken into consideration when awarding contracts for items and services to be financed by the Loan, bearing in mind that preference shall be given to the involvement of natural persons and bodies corporate respectively resident and registered in South Africa.

T. Z. M.  

 The bottom right of the page contains several handwritten signatures and initials. At the top right is a large, stylized signature. Below it, the initials 'T. Z. M.' are written. Further down and to the left are three more sets of initials: 'JH', 'L', and 'MD'.

2.2 The Borrower shall:

- 2.2.1 grant representatives of DBSA the opportunities reasonably necessary to visit any relevant area for purposes related to the Loan;
- 2.2.2 in addition to the amount made available in terms of this agreement, be responsible for the provision of all other funds necessary for the successful execution of the Project as set out in Annexure B, including funds to be supplied by third parties as reflected in that Annexure;
- 2.2.3 be responsible for the management and maintenance of work carried out within the context of the Project, provided that DBSA shall be consulted in this regard when reasonably necessary;
- 2.2.4 with regard to the procurement of goods and services for the Project, in consultation with DBSA, invite participation in tender or quotation procedures on equal terms from natural persons and bodies corporate respectively resident and registered in South Africa and, unless otherwise agreed to by the Parties, follow the following procedures in respect of tenders and quotations:
- 2.2.4.1 tender documents or invitations for quotations shall be drawn up in consultation with DBSA's project team and ratified by DBSA;
- 2.2.4.2 the tenders and quotations shall be invited and, after completion of the steps described in clause 2.2.4.4, adjudicated by the Tender Board, or other responsible body, of the Borrower;
- 2.2.4.3 open tenders shall be open to all interested parties falling within the description contained in clause 2.2.4, and it shall not necessarily be a pre-requisite that the tenderer be a member of any particular association;

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Top right: A large signature, possibly "T. J. M.", with a date "7.2.11" written below it.

Bottom left: A signature that appears to be "J. K. L."

Bottom center: A signature that appears to be "J. P. L."

Bottom right: A signature that appears to be "M. D."

- 2.2.4.4 after consultation with and formal ratification by DBSA, the evaluation and recommendation for appointment of a tenderer shall be submitted to the Borrower's Tender Board or other responsible body by the Project Agent. If this recommendation, in part or whole is not acceptable to the Borrower's Tender Board or other responsible body, that Board or body may make amendments, but such amendments may be implemented only after ratification by DBSA; and
- 2.2.4.5 strict tender procedures shall be adhered to. Where deemed necessary advice and support on possible improvements will be forthcoming from DBSA;
- 2.2.5 ensure that contractors to whom contracts are awarded are insured and remain insured in terms of contractors-all-risk-insurance policies acceptable to DBSA;
- 2.2.6 insure and keep insured at the replacement value thereof, such of its interests in the Project against such risks as may be agreed upon by the Parties;
- 2.2.7 maintain or cause to be maintained records adequate to identify the operations carried out by means of the Loan and furnish DBSA with all such information (e.g. progress reports) concerning the implementation of the Project;
- 2.2.8 submit a statement reasonably acceptable to DBSA, certified on behalf of the Borrower, reflecting the expenditure incurred against goods and services financed in respect of the Project, within 6 (six) months after the end of each financial year of the Borrower during which a drawing is made on the Loan;
- 2.2.9 apply the Loan in accordance with Annexure B;
- 2.2.10 require each contractor to whom a contract is awarded to furnish a performance guarantee acceptable to DBSA, in terms whereof the completion of such contract is guaranteed; and

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 MD  
 JEL  
 JPL



2.2.11 preserve all documents and accounting records pertaining to the Project up to the expiry of a period of 3 (three) years after completion of the Project, and shall allow DBSA at DBSA's cost at any reasonable time to have such documents and records audited by a person or persons nominated by DBSA.


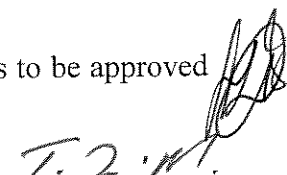


2.3 It is hereby placed on record that the consultants and contractors mentioned in Annexure C hereto have been appointed by the Borrower in respect of the Project, and are acceptable to DBSA.

2.4 Where the Parties agree that the further appointment of consultants or the revision of the brief of appointed consultants is necessary, the following procedures shall be followed unless otherwise agreed to by the Parties:

2.4.1 Before the formal appointment of any consultant for the Project it will be necessary for the Borrower, in the person of the Project Agent and his/her supporting staff, and with the approval of DBSA, to formulate the terms of reference required for such consultant. Particular attention should be given to the following:

- a precise statement of the objectives for the assignment;
- the scope and timing of the required services;
- the inputs to be provided by the Borrower;
- particulars of the outputs (that is reports, drawings, etc.) required of the consultants; and
- identification of a specific person who will be responsible, in the case where the consultant is a firm or a company.

2.4.2 The Borrower will then prepare a short list of capable consultants to be approved by DBSA, utilising the following criteria:

- past experience with similar projects;
- knowledge of local conditions;
- abilities and qualifications;
- membership of professional institutions;
- curriculum vitae of key personnel in the local office in the territory of the Borrower or other office of the consultant from where the work will be carried out.

2.4.3 DBSA's information on capable consultants will be made available to the Borrower for this purpose.

2.4.4 The short list shall include a cost estimate of the services to be provided.

2.4.5 The Borrower will then appoint one of the consultants from the short list, subject to the approval of DBSA.


2.4.6 Should arrangements be made to the effect that DBSA will provide funds to remunerate any consultant, such consultant shall not be appointed without the prior written consent of DBSA.

2.5 DBSA shall use its best endeavours to make technical assistance available to the Borrower within the limits of its resources and upon such terms and conditions as agreed to by the Parties when and if the need for such assistance is identified by the Parties in terms of the provisions of clause 2.1.3 supra.

### 3. THE LOAN

3.1 DBSA shall lend to the Borrower on the terms and conditions set forth in this agreement an amount not exceeding in aggregate R13,360,746 (thirteen million three hundred and sixty thousand and seven hundred and forty six Rand) at the rate of interest set forth in clause 4 hereunder.

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*AK* *h* *MD*  
*RC*

- 3.2 The Loan shall be utilised exclusively for the purpose of the Project as set out in Annexure A, and the Borrower shall ensure that any provisions contained in Annexure A are complied with.
- 3.3 DBSA shall pay the Loan proceeds to and on the order of the Borrower in such disbursements and on such terms and conditions as set forth in Annexure B attached hereto.
- 3.4 The Borrower shall furnish DBSA with particulars regarding officials authorised to apply for withdrawals on its behalf.
- 3.5 The capital amount of the Loan and interest, shall be repaid, in 40 (forty) equal six-monthly instalments, commencing at the end of the 1st (first) Half-year after the Half-year during which the first advance was made to the Borrower from the proceeds of the Loan, and thereafter at the end of each succeeding Half-year until the Loan together with interest thereon shall be fully repaid; provided that the Borrower may, with 1 (one) month written notice to DBSA, make repayments in excess of the abovementioned or repay the full amount outstanding. An instalment shall be a fixed amount, determined as at the outset of the 1st (first) Half-year after the Half-year during which the first advance was made to the Borrower from the proceeds of the Loan, calculated as being sufficient to amortise the outstanding amount, plus interest at the rate set out in clause 4.1 hereof, in 40 (forty) equal six-monthly payments. Should, at the outset of the said 1st (first) Half-year, part of the Loan still not be drawn by the Borrower, the amount of instalments shall be adjusted as and when drawings take place, in order to achieve amortisation over the original period of the Loan.
- 3.6 The Borrower may by notice to DBSA cancel any undrawn portion(s) of the Loan provided that such cancellation shall not jeopardise the proper completion of the Project; it being understood that upon the giving of such notice the instalments referred to in clause 3.5 supra shall be reduced pro rata.
- 3.7 If DBSA reasonably concludes, after consultation with the Borrower, that any portion(s) of the Loan will not be required to finance the Project, DBSA may by notice to the 

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Borrower terminate the right of the Borrower to make drawings in respect of such undrawn portion(s); it being understood that upon giving of such notice the instalments referred to in clause 3.5 supra shall be reduced pro rata.

- 3.8 If DBSA has not received a last claim for an advance under the Loan from the Borrower at the end of the 1st (first) half year after the half year during which the first advance was made to the Borrower, DBSA may terminate further disbursements to the Borrower on 30 (thirty) days written notice to the Borrower unless DBSA, after consideration of the reasons for the delay, has determined a later date for the purposes of this sub-clause. DBSA shall only consider an extension on receipt of a written request from the Borrower and shall notify the Borrower of its decision. A claim shall not be regarded as having been received if it is defective to such an extent that DBSA would not be obliged to make an advance in terms thereof.

#### 4. INTEREST





- 4.1 The Loan shall bear interest on the amount from time to time outstanding at a rate of 15% (fifteen per centum) per annum.

- 4.2 Interest on the amount from time to time outstanding shall be calculated at the end of each Half-year. Payment shall commence at the end of the 1<sup>st</sup> (first) Half-year after the Half-year during which the first disbursement was advanced to the Borrower from the proceeds of the Loan.

#### 5. PAYMENTS

- 5.1 All payments to or by the Parties under this agreement shall be effected in South African Rands.

- 5.2 All payments under this agreement to the Borrower shall be effected to the credit of such banking account(s) of the Borrower as the Borrower may from time to time direct, in writing.

  
T. J. M.  
  

- 5.3 All payments under this agreement to DBSA shall be effected to the credit of such banking account(s) of DBSA as DBSA may from time to time direct, in writing.
- 5.4 Payments in terms of this agreement shall be effected without deduction for and free from any taxes, charges, fees or other costs whatsoever.
- 5.5 Whenever any payment falls due on a Saturday, Sunday or Public Holiday under the laws to which either of the Parties are subject, such payment shall be made on the next succeeding business day.
- 5.6 For purposes of the calculation of interest and repayments, any disbursement for technical assistance, previously approved and forming part of the Loan, paid out before signature of this agreement, shall be deemed to have been paid out on the same date as the first disbursement after signature hereof.

## 6. ON-LENDING

- 6.1 No On-Lending shall be effected unless provided for in Annexure A.

## 7. ACCELERATION OF MATURITY AND IMPROBABILITY OF PERFORMANCE

Should DBSA, after consultation with the Borrower, be able to show that the Borrower will probably not be in a position to perform its financial obligations in terms of this agreement, then DBSA may, after giving the Borrower 30 (thirty) days notice of its intention to do so, demand immediate repayment of all amounts owing by the Borrower in terms of this agreement.

## 8. SUSPENSION AND TERMINATION

- 8.1 DBSA shall be entitled to suspend withdrawals from the Loan or to terminate this agreement, in the event and for so long as the Borrower fails to comply with any provision of this agreement after having given the Borrower 30 (thirty) days written notice to

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J. J. M.


comply with any provision of this agreement and the Borrower thereafter continuing thus to remain in default, in which latter event the full amount owing will become payable.

8.2 The Borrower shall be entitled to terminate this agreement after having given DBSA 30 (thirty) days written notice to comply with any provision of this agreement and DBSA thereafter continuing to remain in default, in which event repayments shall be effected over the same period and at the same interest rate as referred to in clauses 3.5 and 4.1 above respectively, in instalments reduced to the extent that the Loan amount has not been taken up in full but subject to the Borrower's rights to make payments in excess of such instalments or to repay the full amount outstanding as provided for in clause 3.5.

8.3 If any suspensive condition contained herein has not been fulfilled on expiry of the last day of the fifth month after the month during which the agreement has been concluded, then this agreement and all obligations of the Parties shall terminate, unless DBSA after consideration of the reasons for the delay, has determined a later date for the purposes of this sub-clause. DBSA shall only consider an extension on receipt of a written request from the Borrower and shall notify the Borrower of its decision.

8.4 If DBSA has not received a first claim for an advance under the Loan from the Borrower on expiry of the last day of the fifth month after the month during which this agreement has been concluded, then this agreement and all obligations of the Parties shall terminate, unless DBSA, after consideration of the reasons for the delay, has determined a later date for the purposes of this sub-clause. DBSA shall only consider an extension on receipt of a written request from the Borrower and shall notify the Borrower of its decision. A claim shall not be regarded as having been received if it is defective to such an extent that DBSA would not be obliged to make an advance in terms thereof.

## 9. ARBITRATION

9.1 Any dispute arising out of or relating to this agreement concerning the interpretation of the terms and conditions of this agreement or of compliance by any Party with the terms/conditions of this agreement which is not resolved amicably through consultations or negotiations shall, subject to the other provisions of this clause, be settled by arbitration in 

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terms of the Arbitration Act No. 42 of 1965, as amended from time to time; provided that a claim by DBSA for the repayment of any monies due under the loan agreement shall not be regarded as a dispute for the purpose of this clause and neither Party shall therefore be obliged to refer such a claim to arbitration.

- 9.2 In case of arbitration a tribunal shall be composed of one arbitrator who shall be appointed by the Parties by agreement or failing such agreement, by the chairperson of the association of Arbitrators, who shall, in appointing such arbitrator, have regard to the qualifications and experience of the appointee in relation to the nature of the dispute over which he/she has to adjudicate. In case the arbitrator resigns or becomes unable to act, a successor shall be appointed in the same manner as herein prescribed for the appointment of the original arbitrator and the successor shall have all the powers and duties of his/her predecessor.
- 9.3 The arbitration shall be held at the place and in accordance with whatever procedures the arbitrator considers appropriate. In particular, the arbitrator, may, if he/she deems appropriate, conduct the arbitration in an informal and summary manner and without requiring pleadings or discovery of documents and without observing the rules of evidence. The proceedings shall be confidential and neither the Parties nor the arbitrator shall disclose to third Parties any information regarding the proceedings, the award, or settlement terms unless the parties otherwise agree in writing.
- 9.4 After the institution of arbitration proceedings the tribunal may proceed with the arbitration notwithstanding any failure, neglect or refusal of either Party to comply with the provisions hereof or to take part or to continue to take part in the arbitration proceedings. The arbitrator shall within 30 (thirty) days of the termination of the proceedings render a final and binding written award including interest and costs, without furnishing reasons unless otherwise agreed by the Parties in writing.
- 9.5 The provisions of this clause may be invoked by any Party by delivering to the other party a demand, in writing, that an arbitrator be appointed to adjudicate in respect of a specified dispute.

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 J.C.  
 M.D.

## 10. GENERAL

10.1 Any notice or request to be given or made in terms of this agreement shall be in writing and shall be deemed to have been duly given or made when in the case of DBSA, addressed to the General Manager and received at:

Physical address: Development Bank of Southern Africa Limited  
Headway Hill  
MIDRAND  
SOUTH AFRICA; or

Postal address: P O Box 1234  
HALFWAY HOUSE  
1685; or

Telefax number: 011-3133086

and in the case of the Borrower, when addressed to the Borrower and received at the following address:

Postal address: Southern District Council  
Private Bag X5017  
KLERKSDORP  
2570

Physical address: Civic Centre  
Pretoria Street  
KLERKSDORP

Either of the Parties shall be entitled to change the abovementioned addresses by giving notice to such effect by registered post.

10.2 No amendment of, or addition to this agreement shall be valid unless the same has been reduced to writing and signed by or on behalf of the Parties, with the understanding that Annexures A, B and C hereto can be changed by agreement reached through correspondence.

10.3 The non-enforcement of any provision of this agreement or any indulgence which either Party may grant to the other Party shall be without prejudice to the rights of such first-mentioned Party to insist upon strict compliance by such other Party with all the

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provisions of this agreement or to enforce its right in respect of which such indulgence was granted.

- 10.4 This contains the entire agreement between the Parties and no representations, warranties, undertakings or promises of whatever nature which may have been made by any of the Parties, their agents or employees, other than those herein contained, shall be binding or enforceable against them.

## 11. SUSPENSIVE CONDITIONS

The operation of this agreement is subject to:

- 11.1 the approval of the funding arrangement of the Project by the Department of Finance of the South African Government in terms of the Regional Services Act, No 109 of 1985;

## 12. FURTHER TERMS AND CONDITIONS

- 12.1 The Borrower agrees and undertakes not to enter into any further longer short-term financial commitments without first consulting with DBSA.
- 12.2 In the event of private sector co-funding becoming available to the Borrower in respect of the whole or part of the project, at any time, the DBSA loan shall be reduced accordingly.
- 12.3 The Borrower shall design and implement an appropriate environmental and water quality management plan, which shall be made available to the DBSA upon request.

*Handwritten signatures and initials:*  
 T.2.M.  
 J.K.  
 L.  
 P.V.

THUS DONE AND SIGNED AT KLEANSDAAP ON THE 9<sup>th</sup> DAY OF JULY 1997

AS WITNESSES:

- 1. [Signature]
- 2. [Signature]

[Signature]

FOR AND ON BEHALF OF THE  
BORROWER, DULY AUTHORISED  
THERETO IN TERMS OF  
ANNEXURE D ATTACHED  
HERETO

THUS DONE AND SIGNED AT MIDRAND ON THE 10 DAY OF JUNE 1997

AS WITNESSES:

- 1. M MITCHELL
- 2. [Signature]

[Signature]

FOR AND ON BEHALF OF THE  
DBSA, DULY AUTHORISED  
THERETO IN TERMS OF  
ANNEXURE E ATTACHED  
HERETO

## PROJECT DESCRIPTION

### 1. PROGRAMME OBJECTIVE

The Wesvaal Urban Development Programme includes loan financing of several projects in the Southern District Council's (SDC) area of jurisdiction. The programme also includes grant financing from the SDC's own budget and aims to provide affordable services to the under-developed urban communities, thereby improving the quality of life.

### 2. PROJECT OBJECTIVE

To support the economic development of the Greater Klerksdorp urban area through the provision of bulk sewerage infrastructure thereby contributing towards the improvement in quality of life.

### 3. DESIGN PRINCIPLES AND PARAMETERS

The design of the upgrading and extension of the sewage treatment works will follow good and sound engineering as contained in the applicable SABS design codes and specifications. The treatment works will be able to meet the permit requirements, issues by the Department of Water Affairs in terms of the Water Act.

### 4. PHYSICAL DESCRIPTION

The project comprises the design and construction of Phase 2 of extensions to and upgrading of the Klerksdorp Sewage Treatment Works, whereby the capacity will be increased from 24 MI/day to 32 MI/day, and as described more fully as follows:

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...  
...

#### 4.1 New Inlet Works:

It will have a total capacity of ADWF = 36 Ml/day, receiving the total sewage water inflow, emanating from the townships of Greater Klerksdorp, Jouberton, Alabama and Manzilpark. The new inlet works will consist of the following:

- FRONT-RAKE SCREENS  
Two screens (6 mm bar spacing), with spiral conveyer and compactor. The compacted screenings will be disposed of to a solid waste site, after collected in a waste container.
- STANDBY INLET CHANNEL  
In a crisis situation inflow will be diverted to the existing inlet channel which will act as a standby in such situations.
- VORTEX DEGRITTERS  
Accumulated grit will be removed with pumps and grit classifier, dumped into a container, to be disposed of to a solid waste site.
- ULTRASONIC FLOW METER  
Measurement and recording of the total inflow.
- DIVISION BOX  
The total inflow will be divided into a third of the flow to each of the following:
  - Existing primary clarifier No 1
  - New primary clarifier No 2
  - Collection box for unsettled sewage

#### 4.2 Primary Clarifiers

One primary clarifier No 2, identical to existing primary clarifier No 1, to be constructed in this Phase II:

Type	Eschelon scraper
Diameter	27,0 m
Depth (sidewall)	4,0 m
Capacity	12,0 Ml/day (ADWF)
Upward flow velocity	2,4 m/h (Peak Factor 2.55)

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 J. J. J.

Combined the two primary clarifiers will handle only two thirds (2/3) of the maximum inflow of ADWF = 36 Ml/day. One third of the flow will bypass the primary clarifiers as unsettled raw sewage.

From this point forward the flow divides into two processes:

**PROCESS A:** The Activated Sludge process, receiving the primary clarifier overflow, that is the settled raw sewage water and also the portion that bypass the primary clarifiers.

**PROCESS B:** The Anaerobic Sludge Digestion process, receiving the primary clarifier underflow, that is the settled raw sewage sludge. Provision is made for sludge feed to process A if and when more COD load is needed for:

- Nitrification
- Denitrification
- Phosphate removal

With the completion of Phase2 the overflow of the primary clarifiers and the bypass portion will divide to Module 2 and Module 3 (Process A) as follows:

Primary Clarifier No 1	50%	Module 2
(Existing)	50%	Module 3
Primary Clarifier No 2	100%	Module 2
(New)	0%	Module 3
Bypass Portion	75%	Module 2
(Unsettled)	25%	Module 3

**PROCESS A: WATER PURIFICATION SECTION: ACTIVATED SLUDGE PROCESS**

4.3 Aeration Basin Module 2

The capacity of Module 2 reactor will be increased to ADWF = 24 Ml/day in Phase2 as follows:

Inlet and outlet of reactor Module 2 to be modified to handle a ADWF = 24Ml/day.

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Replace the existing ten aerators with new and larger ones to handle the increased organic load as follows:

Existing to be removed:	and Replaced with:
2 x 75 kW Aerator	2 x 110 kW Aerators
4 x 55 kW Aerators	2 x 110 kW Aerators
2 x 55 kW Aerators	2 x 90 kW Aerators
2 x 30 kW Aerators	2 x 90 kW Aerators
2 x 7,5 kW Aerators	2 x 30 kW Aerators

Installation of one turbidity meter for better control of mixed liquor suspended solids (MSS). This meter will be connected to an electrically operated valve installed in the underflow pipe of clarifier no 4 to waste activated sludge as and when necessary.

Installation of two DO meters in aeration basin for better control of dissolved oxygen concentration and therefore electricity consumption.

The operational criteria are:

Sludge return	1:1 (Secondary clarifier underflow)
Sludge age	15 days
MLSS	3000-4000mg/l

#### 4.4 Secondary/Final Clarifiers

##### 4.4.1 Module 2

Two new final clarifiers (no 4 & 5) to be constructed:

Type	Suction lift
Diameter	30,0m
Depth	4,0 m
Upward flow velocity	2,0 m/h (Peak factor = 2.55)

The two new 30m Ø together with the existing three 27 m Ø secondary clarifiers receive all the reactor Module 2 effluent, that will be for a ADWF = 24 Ml/day plus 1:1 recirculation and divide to the five clarifiers in the following ratio:

Clarifiers No 1,2 & 3	18,8% each
Clarifiers No 4 & 5	21,8% each

The overflow to chlorination collection box and after chlorination through chlorine, contact channels, to Schoon Spruit as final effluent:

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L  
P.L. J.H.

The underflow of all five clarifiers recirculate via screw pump station to inlet of Module 2.

The waste activated sludge (WAS) portion will be withdrawn from clarifier No 4 with an electrically operated valve to the WAS pump station.

#### 4.4.2 Return sludge pump station

The screw pump station will be fitted with an extra Gorman Rupp T10 with 30kW motor to handle the extra sludge return required.

#### 4.5 Chlorination and Chlorine Contact Channel

All the treated final effluent will pass through the chlorine contact channel and after the required retention period it will enter the Schoon Spruit.

Provision have been made in phase 3 for a accurate effluent flowmeter (with venturi) and also extra chlorine contact channel capacity if and when required.

### **PROCESS B: SLUDGE HANDLING SECTION: AEROBIC & ANAEROBIC DIGESTION**

#### 4.6 WAS Pumpstation and Aerobic Sludge Digests

The two digester ponds receive presently all the WAS from WAS pump station. The sludge is further stabilised by means of aeration with two aerators in each pond and finally pumped to the sludge lagoons.

The WAS pump station will be modified as follows:

- One new extra pump to handle the increased WAS
- New Pamplona pumping directly to the modified sludge lagoon.

The two aerobic sludge digesters will be taken out of commission and will be used as supernatant storage ponds if and when necessary.

#### 4.7 Sludge Lagoons

One of the two sludge lagoons will be modified to act as an open anaerobic sludge digester as follows:

- Nine inlet hoppers will be installed for the disposal of WAS sludge and partially digested raw sludge into the lagoon.

*T. J. M.*  
*del* *del*

- Four outlet hoppers will be installed for the draw-off of digested sludge to the drying ponds.
- A pumping system to be installed in Phase3 to supply a continuous flow of 1,5 m aerobic top layer water, if necessary.

With the modification of one sludge lagoon it will have a capacity to handle the waste activated sludge and partially digested raw sludge from the anaerobic sludge digesters of a inflow of ADWF = 36 Ml/day.

#### 4.8 Anaerobic Sludge Digests/and the Production of Volatile Free Fatty Acids

In Phase 3 two new anaerobic sludge digester ( 1250 m Ø each) will be constructed if necessary and combined with the three existing and will have the capacity to handle two thirds of the settled sludge of a inflow of ADWF =26 Ml/day.

The digested sludge is pumped to the following destinations:

- To the inflow of Module II and III this modification will only be constructed in Phase 3 after a thorough testing program during Phase 2 to determine the volatile free fatty acids quantity required for the effective nitrate removal and therefore the more effective removal of phosphate.
- To the nine inlet hoppers of the open pond anaerobic sludge digested.
- When and if necessary to the sludge drying ponds.

#### 4.9 Sludge Drying Ponds

At maximum capacity 30 x 1000m<sup>2</sup> drying ponds will be provided. In phase 1 eight ponds were provided, in phase 2, 10 ponds will be provided and 12 in phase 3. The ponds receive all the digested sludge from both the five anaerobic sludge digesters and the one open pond anaerobic sludge digester. After approximately 2-3 days the sluices will be fixed to allow the supernatant to be drawn off. The supernatant gravitate to the drying pond pumpstation.

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J. L.



As soon as the sludge reaches a manageable dryness it will be removed with front-end loaders and stockpiled and processed into compost.

#### 4.10 Drying Pond Pumpstation & Existing Sludge Lagoons

The pumpstation receive all the supernatant from the drying ponds. Presently the supernatant is pumped back to the raw sludge thickener overflow point, from where it gravitate to the screw-pump sump at module 2. With the completion of phase 2 the accumulated supernatant will be pumped via a new Pamplona to the remaining sludge lagoon not been modified. The sludge lagoon will then act as evaporation, or irrigation pond and or holding pond for the aerobic top layer of 1,5 m for open pond anaerobic sludge digested.

### 5. COST ESTIMATE

Description	Estimated Cost (R'000)
Preliminary planning and Feasibility	R200,000
Civil construction, building work, electro-mechanical equipment required in Phase 2 to augment the Klerksdorp Sewage Treatment Plant from 24 Ml/day to 32 Ml/day; (all items include Contingencies and Escalation).	R11,388,491
Professional fees, disbursements & site supervision.	R1,772,255
SUB TOTAL:	R13,360,746
VAT @14%:	R1,870,504
TOTAL:	R15,231,250

#### 5.1 PROJECT OUTPUT

The completion of the project will provide for the treatment of increased volumes of sewage effluent and the safe discharge thereof to a public stream after treatment and thereby enhance the general amenity of the urban area.

*MD*  
*T.2.M.*  
*JBC* *JK*

## 6. IMPLEMENTATION

### 6.1 INSTITUTIONAL ARRANGEMENTS

- The Borrower shall draw up formal tender documents, with a comprehensive Bill of Quantities and construction, which must be approved by the Project Steering Committee before going out on public tender.
- The Borrower shall compile the tender documents in such a manner as to enable local small contractors to tender for specified tasks, such as trench excavation, pipe laying and masonry building work, and to utilise local labour in the execution of these tasks.
- The Steering Committee, formed to oversee the implementation of Phase 1 of this project will continue to function for the full implementation of this Phase 2. DBSA will continue to have observer status on the Steering Committee as in Phase 1.


### 6.2 MANAGEMENT POLICY

- The Borrower and the Klerksdorp TLC supports the policy of employing local small contractors and local labour to perform as much as possible of the construction work.
- The Borrower, being the owner of the works, undertakes to ensure compliance by the Klerksdorp TLC, being the agent of the Borrower, with acceptable environmental management principles and that a suitable system is in place to implement such principles before the extensions to the sewage treatment plant is commissioned.
- The Borrower, being the owner of the works, shall ensure that the Klerksdorp TLC, being the agent of the Borrower, shall design and implement a monitoring programme to routinely analyse the water quality and flow of water from the works as well as incoming industrial and effluent as it is required in terms of the Water Act, Act No 54 of 1965, and its amendments, and as is described in detail in the environmental assessment report (Klerksdorp Waste Water Treatment Works Environmental Assessment, BKS Inc. Project No P607901, Report No I04/170, April 1996). The programme shall include the routine analysis of pH, conductivity, COD, suspended

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solids, nitrates, ammonia and phosphates. Residual chlorine and faecal coliforms must be determined in the final effluent.

- The Borrower, being the owner of the works, shall ensure that the Klerksdorp TLC, being the agent of the Borrower, makes adequate provision on its annual operational budget for the proper maintenance of the assets created by this project.

  
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h  
J.K.

APPLICATION AND SOURCE OF FUNDS STATEMENT.



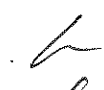

JOUBERTON/KLERKSDORP: UPGRADING OF SEWAGE TREATMENT PLANT PH. 410556/1/1)

Description	Total (R)	DBSA (R)	%	Borrower (R)	%	Other (R)	%
PREPARATION COST	200,000	200,000	100.0	0	0.0	0	0.0
1.1 PRELIM PLAN & FEAS STUDY							
FIXED ASSETS	13,160,746	13,160,746	100.0	0	0.0	0	0.0
2.1 CONSTRUCT. (INCL. CONTIN & ESC)							
Totals	13,360,746	13,360,746	100.0	0	0.0	0	0.0

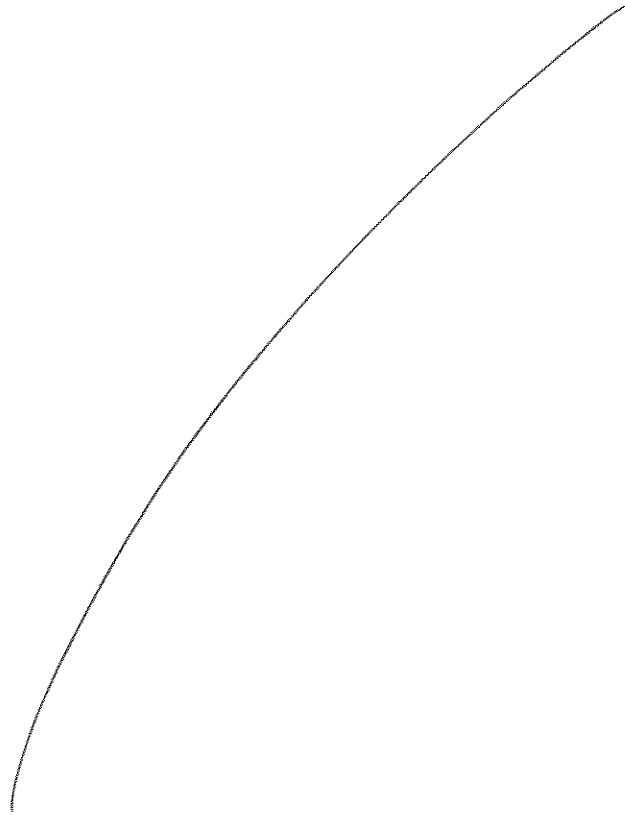
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II. TERMS AND CONDITIONS OF DISBURSEMENT

Disbursement of each progress claim in respect of the amount financed by DBSA is to be effected as a ratio of actual cost of each item (for each phase) in accordance with the Application and Source of Funds Statement (Annexure BI), read together with the Project Description (Annexure A), to the maximum amount of R13,360,746. This is subject to submission to DBSA of fully documented proof of payment(s) by the Borrower to supplier(s), consultant(s) and/or contractor(s), of actual claims (or in-house expenses incurred), as approved by the Borrower or its authorised representative. Each progress claim is to be in the itemised format as depicted in Annexure B1.

   
T. 2. M.  
 



LIST OF CONSULTANTS AND  
CONTRACTORS ALREADY APPOINTED



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*T. J. M.*  
*[Handwritten signature]*

AUTHORISATION - BORROWER

23/06/97  
{legal}[word]<NW10556>

   
T. 2 m.  
A. L. J. L.

AUTHORISATIONDEVELOPMENT BANK OF SOUTHERN AFRICA**IAN ANDREW GOLDIN**

in his capacity as Chief Executive of the Development Bank of Southern Africa, in terms of authority delegated to the incumbent of his post by the Board of Directors of the Development Bank of Southern Africa on 19 September 1985, determined on 25 September 1996 that:

**IAN ANDREW GOLDIN**  
in his capacity as Chief Executive

OR

**JACOB HENRY DE VILLIERS BOTHA**

OR

**MANDLA SIZWE GANTSHO**

OR

**KHOTSO MOLEFE NTSEARE**  
in their capacity as Executive Managers

OR

**PULE LESAILANE MOKHOBO**  
in his capacity as Manager: Legal Services

OR

**DAVID FERREIRA**

OR

**CHRISTINA JOANNA GOLINO**

OR

**CHRISTIAAN STEPHANUS HEYMANS**

OR

**BANE MOEKETSI MALEKE**

OR

**MAGARE LUTHER MASHABA**

T. Z. M.



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OR

**FAZAL MEHMOOD SAIB**

OR

**JENNIFER DAPHNE TYOBEKA**

OR

**DENNIS MDUDUZI ZIMU**

in their capacity as Managers: Business Units (DSP Related)

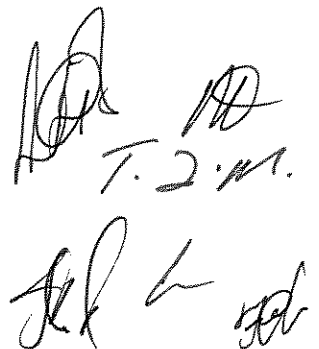
be authorised for and on behalf of the Development Bank of Southern Africa to enter into agreements in terms whereof money is:-

1. lent, or
2. granted for the purpose of technical assistance,

and to perform all acts and sign all documents that may be necessary for the purpose

\_\_\_\_\_  
DATE

\_\_\_\_\_  
LEGAL SERVICES BUSINESS UNIT

  
T. J. M.  
J. L. M.