

Verw: 1815DOV-S1

Datum: 06/06/2018

Messrs *Grassroots Group*  
Posbus 16  
GOUDA  
6821

Attention: Mr Niel Cox & Rikus Muller

**FEASIBILITY STUDY FOR THE PROPOSED NEW DAM ON FARM HARTEBEEKRAAL 88 PORTION 8, TULBAGH DISTRICT, GRASSROOTS GROUP**

Thank you for the trust you have put in us to serve you with advice and appropriate expertise. Our discussions regarding the feasibility of the proposed new dam on farm 88/8 near Gouda, refer.

**1. ATTACHMENTS**

- **Appendix A** ~ Locality Map
- **Appendix B** ~ *Benede-Bergrivier IB* Listings
- **Appendix C** ~ Scoping & Feasibility Evaluation
- **Appendix D** ~ Geological Map
- **Appendix E** ~ Biodiversity Map
- **Appendix F** ~ Title Deed Report
- **Appendix G** ~ Concept Drawing

**2. BACKGROUND**

This report is essentially a desktop study based on aerial photo's, contour maps, geological maps, regional hydrological data etc, with the purpose of highlighting strategic information regarding aspects such as alternatives, water availability, proposed positioning, applicable legislation, overall geology, potential storage as well as ballpark costing. The main purpose of this report is to serve as a discussion document and also for directive decision making before proceeding to the next stage as set out below.

A typical project of this nature comprise of 6 chronological stages with this report considered as the first stage of the following:

- S1 Scoping & Feasibility study
- S2 Preliminary Design
- S3 Final Design
- S4 Documentation and Tendering
- S5 Construction
- S6 Completion

The above stages also serve as milestones for purposes of invoicing or as otherwise agreed.

The site is located approximately 10km north-west from Gouda as the crow flies as shown on **Appendix A**.

### 3. ASSIGNMENT

The current assignment of the envisioned new dam entails the compilation of a condensed scoping and feasibility report.

To our knowledge no appointments have been made with regard to the submission of an application for a water use license neither for an environmental impact assessment in terms of applicable legislation. As soon as a decision is reached regarding the way forward, we suggest that these appointments be considered and activated as soon as possible given the fact that both can be time consuming exercises.

Our assignment, as understood from the discussion for the purposes of this report, comprises only the scoping or feasibility study regarded as the first stage of the overall design process. However, we have not received an instruction to proceed with any of the other related aspects such as water licensing and/or environmental assessment procedures etc.

### 4. SITE EVALUATION AND ALTERNATIVES

The focus and purpose of the investigation sprouts from the overall development planning of the concerned farming enterprise by way of storing listed winter water for use during the summer season. However, available options are limited on the concerned property due to limited suitable sites due to the relative flat topography of the property. Nevertheless, this initial investigation shows that the site appears to be able to accommodate only a portion of the envisaged or intended capacity which is in the order of  $\pm 150\,000\text{m}^3$  based on the allowable proportionate storage of listed winter water from the Berg river system as discussed below.

The potential storage characteristics of the site was obtained from a site survey done on 18 April 2018. The options on Farm 88 Portion 8 are limited to this one site which was evaluated with regard to potential storage capacity versus dam wall height and ball park costing.

**Appendix G** shows the location of the proposed new dam site.

Various options have been analysed for purposes of evaluation and comparison for optimising and planning, refer to **Appendix C & G** for detail.

**Table 1** below shows the comparison of key characteristics for the proposed new dam.

| <b>Proposed New Dam</b>                   | <b>Stage 1</b> | <b>Stage 2</b> | <b>Stage 3</b> | <b>Stage 4</b> |
|---|----------------|----------------|----------------|----------------|
| Wall height (m)                           | 4.9            | 5.3            | 5.7            | 6.0            |
| Crest length (m)                          | 143            | 160            | 168            | 174            |
| Earthfill / Earthmoving (m <sup>3</sup> ) | 9,200          | 10,800         | 12,200         | 13,400         |
| Gross Storage Capacity (m <sup>3</sup> )  | <b>55,000</b>  | <b>65,000</b>  | <b>76,000</b>  | <b>87,000</b>  |
| Storage ratio (X : 1)                     | 5.44           | 5.57           | 5.74           | 5.99           |
| Flooded Area (ha)                         | 2.40           | 2.6            | 2.9            | 3.2            |

The site evaluation also shows that there is not much variation in scale of economy based on the storage ratio's which normally increases substantially for larger scenarios. Dams with storage ratio values less than  $\pm 1,5$  are generally considered extremely poor. Although considerably better, the proposed new dam has values slightly greater than the target storage ratio value of  $\pm 5$  which is generally considered as economically viable.

In terms of dam safety legislation certain thresholds do apply based on the size and risk of the dam under consideration which in turn determines its classification. All dams with wall heights exceeding 5m AND storage capacities exceeding  $50\,000\text{m}^3$  are to be registered and classified with the dam safety office (DSO). Category 1, 2 & 3 dams require different levels of technical expertise including accredited engineering input as and where specified. Based on these thresholds and requirements, all proposed options are considered above the applicable trigger levels subject to dam safety regulations except for the smallest option.

**Please note**, water use licenses (WUL) and environmental authorisations (EA) are not covered here but are governed by separate and independent legislation as discussed elsewhere.

## 5. WATER AVAILABILITY

All water usages are governed by the National Water Act (Act 36 of 1998) (NWA). The process of determining the availability of water for any kind of development involving the use of water also requires looking into and verifying the current water usage of the particular farming unit or development in order to understand the integration of such proposed new water usage to the existing for purposes of the Water Use License Application (WULA) to be considered.

Our understanding of the proposed development is that it does not include any new “takings” from the existing nearby source in terms of the NWA. In principle the aim is to secure an existing water use, which is current winter listings under the *Benede-Bergrivier Irrigation Board*, by increasing the capacity of the existing small dam on the property. **Note**, the application will mainly focus on reducing the risk of failure to be able to irrigate under dry or difficult conditions.

### Listed water with *Benede-Bergrivier Besproeiingsraad* ~ (Appendix B1)

|                      |                               |                               |
|----------------------|-------------------------------|-------------------------------|
| Hartebeeskraal 88/8: | 28.4 ha @ 7 000m <sup>3</sup> | = 198 800m <sup>3</sup>       |
| <b>TOTAL:</b>        |                               | <b>= 198 800m<sup>3</sup></b> |

In essence all existing water uses are tagged “*lawfulness to be determined*” until verified and validated in terms of the NWA. The Verification and Validation (V&V) process has recently been launched in certain catchment areas nationwide. The purpose of the said process is to evaluate and legalise historical and current water usages within a particular catchment based on aerial photographs as well as applicable and relevant documentation. In this case where the V&V process has been initiated, such action normally forms part of the water use license application (WULA) with Department of Water Affairs & Sanitation (DWAS). In principle the WULA will first have to prove that the current water usages are in order in terms of the water act awaiting the outcome of the V&V.

**Note**, since this application does not include any new “takings” and is solely based on scheduled water which is considered an existing lawful use (ELU) for purposes of this report, a water availability investigation is not considered relevant neither a requirement and no other ELU's will be affected as such.

However, although not considered part of the lawful water use exercise above, we have done and also included the hydrological potential of the local catchment of the proposed dam showing a potential runoff (MAR) in the order of ±80 000m<sup>3</sup> based on the WRC model as presented in **Appendix B2**. This is however not a guaranteed volume but gives an idea of what could possibly be expected from runoff in average years as a potential saving against pumping from the river.

## 6. GEOLOGY

The proposed site is situated within the formations forming part of the Porterville Formation and the Malmesbury Series as shown by **Appendix D**.

The 1:250 000 Geological Map (3318Kaaopstad) of South Africa describes the local and surrounding formations as follows:

- Npo** ~ *Phyllite shale, schist and greywacke with dark-grey limestone, sporadic quartzitic sandstone beds and conglomerate lenses*
- m** ~ *Alluvium*
- Qs** ~ *Lightgrey to pale-red sandy soil*

The geological overview further points out and positions the site right on the border between alluvium and shale/sandstone formations. When it comes to alluvial type formations, there will be a high risk of leakage depending on the cementing material within the matrix. Sealing these type of formations are often complex and expensive and should be considered with care for a dam of this size.

In addition to the variation in formations there are only a few geological features some distance away from the proposed site indicated on the map which only requires mentioning at this stage. At this stage we don't foresee any risk or interdependency between these features and the water tightness of the site. Depending on the exact position and alignment, these fault zones or features might also impact on the seismic requirements in the design.

No soil tests have been done as yet and this is just an overview of the global geology at the sites and it may be that the local geology or soil conditions are such that it might even have cost implications on both the final design as well as construction thereof.

## 7. STATUTORY REQUIREMENTS

The process regarding the construction of a dam typically involves three independent regulatory or legislative procedures namely, [A] Dam Design & Construction, [B] Environmental Impact Assessment (EIA), and [C] Water Use License (WUL). The latter also includes clarification of all existing lawful water uses with the Department Water & Sanitation.

Our office specializes and offer our services with regard to dam safety procedures in terms of dam safety legislation including design and construction supervision and as well as the compilation and submission of water use license applications. However, when it comes to environmental impact assessments, we can assist in obtaining quotes for the task as well as to assist with the appointment of independent consultants. Other legal aspects that might also have to be addressed in the process include issues such as BBBEE, roads- and other services authorities as and when applicable.

The main objective when building a dam or structure of this nature is to obtain a **License to Construct** from the Department Water & Sanitation (DWS). In order for such a license to be issued, proof is required that both the *Water Use License & Clarification* as well as the *Environmental Authorisation* are in place. Both of these actions are time consuming and overall planning should allow for anything between 1 and 2 years before a license to construct might be obtained. In order to achieve and satisfy these goals, the design process of the dam should proceed to the second stage of *Preliminary Design* mentioned above, which will then serve as backbone or addendum to both these applications. The purpose of the proposed works, including the intended use of the water, will also have to be clarified and motivated in these applications.

A factor that would trigger additional environmental aspects in this case is if any component of the dam comes within 32m from the riverbank.

## 8. SPECIALIST SERVICES

Depending on the final layout, intended size, water use requirements, etc, certain aspects might have to be investigated should the proposed dam trigger certain natural processes and/or cultural and historical aspects. Such services may include, biodiversity / botanical assessments, freshwater studies and/or archaeological / heritage studies unique to each project. Clarity on these issues will be acquired during the next stage of *Preliminary Design*.

## 9. COST ESTIMATE

A basic site survey was done and all quantity and volume related figures presented herein are based on information obtained and generated from this survey in combination with information from available sources such as contour maps, GIS information systems, etc which is considered to be accurate enough and acceptable for this purpose. In this case the surveyed information was superimposed over aerial photographs from which detailed contours were generated for the purpose of use in 3D topographical modelling.

All the volumetric and related estimates are based on the same principles giving opportunity to compare dam options on the same basis for decision making with reference to the magnitude of the proposed works rather than trying to present highly accurate figures at this early stage. Bulk earthworks tariffs derived from recent tender prices and information from similar projects was used for costing purposes including a percentage allowance for specials, overheads, fees, etc. See **Appendix C** for detail.

**Table 2** below shows the estimated bulk earthworks and related costing:

| <b>Proposed New Dam</b>                    | <b>Stage 1</b> | <b>Stage 2</b> | <b>Stage 3</b> | <b>Stage 4</b> |
|--|----------------|----------------|----------------|----------------|
| Wall height (m)                            | 4.90           | 5.30           | 5.70           | 6.00           |
| Potential gross capacity (m <sup>3</sup> ) | 55,000         | 65,000         | 76,000         | 87,000         |
| Earthmoving                                | 9,200          | 10,800         | 12,200         | 13,400         |
| Estimated Project Costs                    | R 620,000      | R 727,000      | R 823,000      | R 901,000      |

Another aspect to keep in mind is the fact that foundation excavations of the core trench or sealing the dam can often be a costly item along with hidden surprises that can surface at the time of construction. For this reason proper foundation and geological exploration exercise will be required as part of the design process in order to eliminate such unwelcome and often costly surprises.

The site in general is relatively flat, however, it still results in fair storage ratio's being the prominent reason for the reasonable overall unit costs. Although not to a large degree, it is noted that the storage ratio does increase along with increase in the size of the dam.

However, the above are considered estimates based on certain assumptions at this stage which can differ substantially from the final costings which are to be based on more accurate site surveys which will also take into account the outcome of the site exploration works.

## 10. WAY FORWARD

This document serves as a discussion document for decision making regarding the way forward. In order to proceed we propose for the following to be addressed:

- Evaluate and choose between the proposed options with regard to the following:
  - ~ Optimum with regard to storage & benefits
  - ~ Dam safety and related issues
  - ~ Cost & risks factors regarding geological conditions
- Proceed with the preliminary design stage of the preferred option above, including
  - ~ Classification in terms of dam safety regulations
  - ~ Applicable dam safety regulations in terms of the National Water Act, 1998
  - ~ Appoint accredited engineer for the task, as required
- Activate the environmental impact assessment application accordingly, including
  - ~ Appointment of Environmental Consultants
  - ~ Apply for Environmental Authorisation in terms of NEMA procedures
  - ~ Specialist reports if required such as Aquatic, Historic & Cultural, etc.
- Activate the water use license application, including
  - ~ Appointment of Consultant
  - ~ Classify existing lawful water uses in terms of water use registrations with WARMS
  - ~ Section 27 motivation in terms of Article 27(1) of the National Water Act, 1998
  - ~ Consider Broad-Based Black Economic Empowerment, BBEEE
- Obtain and keep in hand all information required:
  - ~ Legal Ownership of Properties (Title Deeds) etc
  - ~ Business Registrations
  - ~ Applicable business agreements and/or arrangements etc

## 11. CONCLUSION & RECOMMENDATIONS

From the site survey it is concluded that the proposed new dam site can only accommodate  $\pm 55\%$  of the envisaged storage capacity of  $\pm 150\,000\text{m}^3$  of the scheduled winter water.

However, when considering the smaller options limited by the buildings on the northern side, the storage ratio is considered reasonable from an economical point of view. We hereby conclude and recommend as follows:

- Consider appropriate sizing of the dam with respect to dam safety thresholds of 5m wall height or  $50\,000\text{m}^3$  capacity, apply for classification if one of these thresholds is acceded,
- Appoint consultant for the EIA and align environmental application accordingly,
- Appoint consultant for the WULA and activate accordingly,
- Consider to proceed with the preliminary design stage for purposes of the EA & WULA requirements.

You are welcome to contact us for further information should there be any queries. We trust that you will find above in order and that we can expect a response in due time.

Yours faithfully



---

M Charl Bester (Pr Ing)



# BENEDE-BERGRIVIER BESPROEIINGSRAAD

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FAKS 086 543 7021  
E-POS bbbbr@vodamail.co.za

POSBUS 214  
PORTERVILLE  
6810

01 Februarie 2017

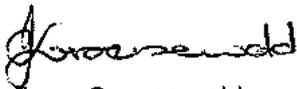
## WIE DIT MAG AANGAAN

Hiermee bevestig die Benede-Bergrivier Besproeiingsraad dat die ondergemelde eiendomme se inlysting op die oomblik as volg is:

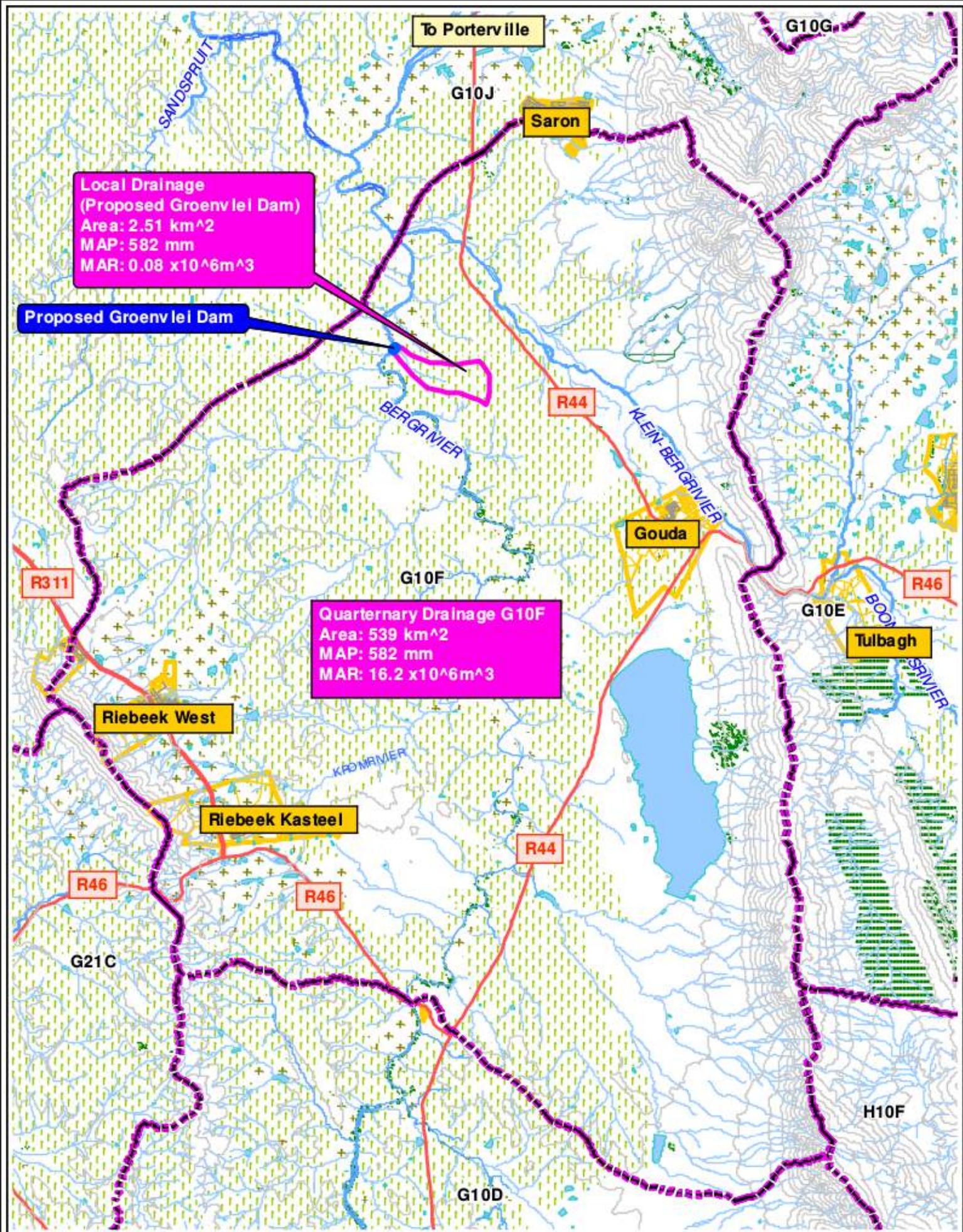
|                                      |                    |               | Distrik |             |
|--------------------------------------|--------------------|---------------|---------|-------------|
| GRONDBESKRYWING                      | NAAM               | Data          | Tulb    | Grand Total |
| HARTEBEEKRAAL 88 GED 8               | Gravenholm Prop BK | Sum of Somer  | 31.6    | 31.6        |
|                                      |                    | Sum of Winter | 28.4    | 28.4        |
| HARTEBEEKRAAL 88 GED 8 Sum of Somer  |                    |               | 31.6    | 31.6        |
| HARTEBEEKRAAL 88 GED 8 Sum of Winter |                    |               | 28.4    | 28.4        |
| Total Sum of Somer                   |                    |               | 31.6    | 31.6        |
| Total Sum of Winter                  |                    |               | 28.4    | 28.4        |

Die bogemelde eiendomme is geregtig om 7 000 kubieke meter water per hektaar per jaar uit die Bergrivier te gebruik vir landboubesproeiingsdoeleindes.

Die uwe



Corinne Groenewald  
ADMIN BEAMPTE



**SAREL BESTER INGENIEURS BK**  
 Registered South African Consulting Engineers  
 Registered with the Board for Engineering and Geosciences  
 No. 12029/2015  
 No. 12029/2015  
 No. 12029/2015

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 Tel 023 312 2017 / Epos sbri@telkomsa.net

**Client:** Grassroots Group (Pty) Ltd  
 PO Box 16  
 Gouda  
 6821

**Project:** Proposed Groenvlei Dam  
 HYDROLOGY MAP

**Map Ref:** 3318BB

**Project Ref:**  
 1815

**Scale:**  
 1: 150 000

**SCOPING EVALUATION REGARDING THE PROPOSED EARTH DAM: QUANTITIES AND COSTING**

**Client:** Grassroots Group

**Project Nr.:** 1815

**Version:** Jun 2016

**Address:** P.O. Box 16  
GOUDA 6821

**Annexure:**

**Prepared:** SH

**Report by:** Charl Bester

**Dam:** GROENVLEI DAM

**Date:** 25-May-18

SAREL BESTER ENGINEERS

- Notes:** 1. VAT EXCL.  
2. Trimble survey & GIS contours  
3

P.O. Box 21, Ceres 6835

Ph: 023-312 2017

Fax: 086-514 3350

**Wall Design:**

Crest width (m): 4.0

Upstream slope 1: 3.0

Downstream Slope 1: 2.0

Freeboard (m): 1.0

Percentage of fill from dam basin: 50%

**Design Assumptions:**

Cut-off depth (m): 4.00

Gross Usage (m<sup>3</sup>/ha): 8,500

Re-use Exist Fill (%): 0%

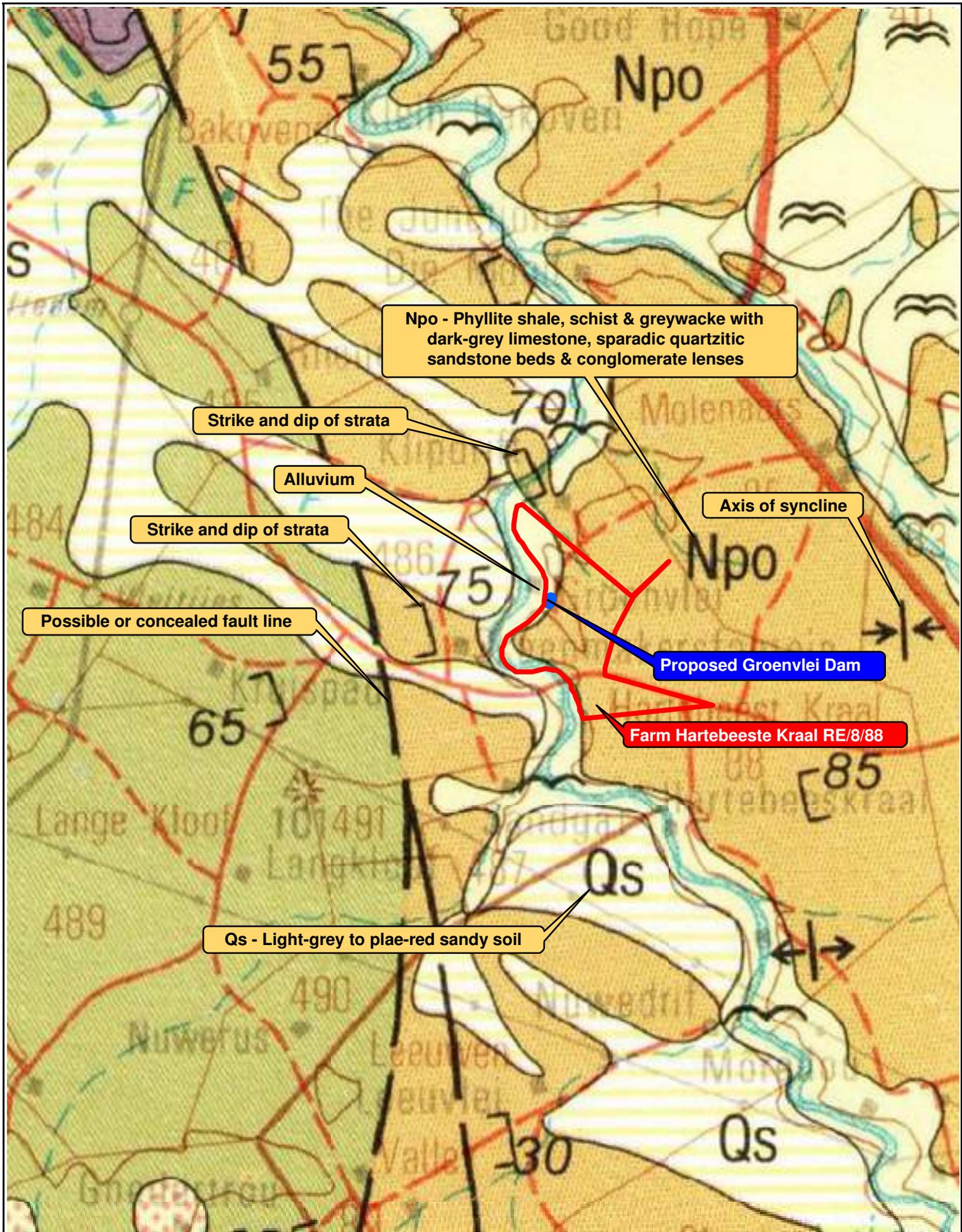
Re-use Exist Core (%): 0%

**Financial Assumptions:**

Earthmoving cost (R/m<sup>3</sup>): 45.00

Cost Fact [O/H, Outlet, Fees,...]: 1.50

| Item                             | Description                        | Unit                 | Stadium / Wall position / Terrain |                |                |                |           |
|----------------------------------|------------------------------------|----------------------|-----------------------------------|----------------|----------------|----------------|-----------|
|                                  |                                    |                      | Stadium 1                         | Stadium 2      | Stadium 3      | Stadium 4      | Stadium 5 |
| <b><u>1 EMBANKMENT</u></b>       |                                    |                      |                                   |                |                |                |           |
| 1.5                              | Crest length                       | m                    | 142.50                            | 159.80         | 168.00         | 174.00         | 0.00      |
| 1.3                              | Wall Height                        | m                    | 4.90                              | 5.30           | 5.70           | 6.00           | 0.00      |
| 1.4                              | Base Width                         | m                    | 28.50                             | 30.50          | 32.50          | 34.00          | 0.00      |
| 1.6                              | Volume - excluding cut-off         | m <sup>3</sup>       | 5,199                             | 6,291          | 7,490          | 8,477          | 0         |
| 1.7                              | Cut-off trench excavation          | m <sup>3</sup>       | 3,990                             | 4,474          | 4,704          | 4,872          | 0         |
| <b>1.8</b>                       | <b>Total Earthmoving</b>           | <b>m<sup>3</sup></b> | <b>9,189</b>                      | <b>10,765</b>  | <b>12,194</b>  | <b>13,349</b>  | <b>0</b>  |
| <b><u>2 STORAGE CAPACITY</u></b> |                                    |                      |                                   |                |                |                |           |
| 2.1                              | Freeboard                          | m                    | 1.00                              | 1.00           | 1.00           | 1.00           | 1.00      |
| 2.2                              | Water depth                        | m                    | 3.90                              | 4.30           | 4.70           | 5.00           | 0.00      |
| 2.3                              | Water surface                      | ha                   | 2.40                              | 2.60           | 2.90           | 3.20           |           |
| 2.4                              | Contour capacity                   | m <sup>3</sup>       | 50,000                            | 60,000         | 70,000         | 80,000         |           |
| 2.5                              | Potential gross capacity           | m <sup>3</sup>       | 54,595                            | 65,383         | 76,097         | 86,675         | 0         |
| 2.6                              | Potential irrigation               | ha                   | 6.42                              | 7.69           | 8.95           | 10.20          | 0.00      |
| 2.7                              | Ratio (Storage : Earthworks)       |                      | 5.44                              | 5.57           | 5.74           | 5.99           | 0.00      |
| <b><u>3 COSTING</u></b>          |                                    |                      |                                   |                |                |                |           |
| 3.1                              | Estimated Construction Cost        | Rand                 | 620,271                           | 726,657        | 823,095        | 901,088        | 0         |
| 3.3                              | Estimation: Specialized Components | Rand                 | 0                                 | 0              | 0              |                |           |
| <b>3.3</b>                       | <b>Estimated Project Cost</b>      | <b>Rand</b>          | <b>620,271</b>                    | <b>726,657</b> | <b>823,095</b> | <b>901,088</b> | <b>0</b>  |



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**Client:** Grassroots Group (Pty) Ltd  
PO Box 16  
Gouda  
6821

**Project:** Proposed Groenvlei Dam  
GEOLOGY MAP

**Map Ref:** 3318 – Cape Town

**Project Ref:**  
1815

**Scale:**  
1: 50 000



# Critical Biodiversity Areas & Ecological Support Areas BIODIVERSITY MAP:

## Legend

### BSP ESA

- ESA: Aquatic
- ESA: Terrestrial

### BSP CBA

- CBA: Terrestrial
- CBA: Terrestrial (CT)
- CBA: Forest
- CBA: River
- CBA: Estuary
- CBA: Wetland
- CBA: Aquatic (CT)

Scale: 1:5 000

Date created: May 16, 2018



Western Cape  
Government

Agriculture

Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS User community  
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS,

# WinDeed Database Deeds Office Property



HARTEBEESTE KRAAL, 88, 8 (REMAINING EXTENT) (CAPE TOWN)

| GENERAL INFORMATION |                  |
|---------------------|------------------|
| Date Requested      | 2018/04/19 16:16 |
| Deeds Office        | CAPE TOWN        |
| Information Source  | WINDEED DATABASE |
| Reference           | 1815             |



| PROPERTY INFORMATION  |                      |
|-----------------------|----------------------|
| Property Type         | FARM                 |
| Farm Name             | HARTEBEESTE KRAAL    |
| Farm Number           | 88                   |
| Portion Number        | 8 (REMAINING EXTENT) |
| Local Authority       | WITZENBERG DC        |
| Registration Division | TULBAGH RD           |
| Province              | WESTERN CAPE         |
| Diagram Deed          | T69379/2007          |
| Extent                | 165.7552H            |
| Previous Description  | -                    |
| LPI Code              | C0750000000008800008 |

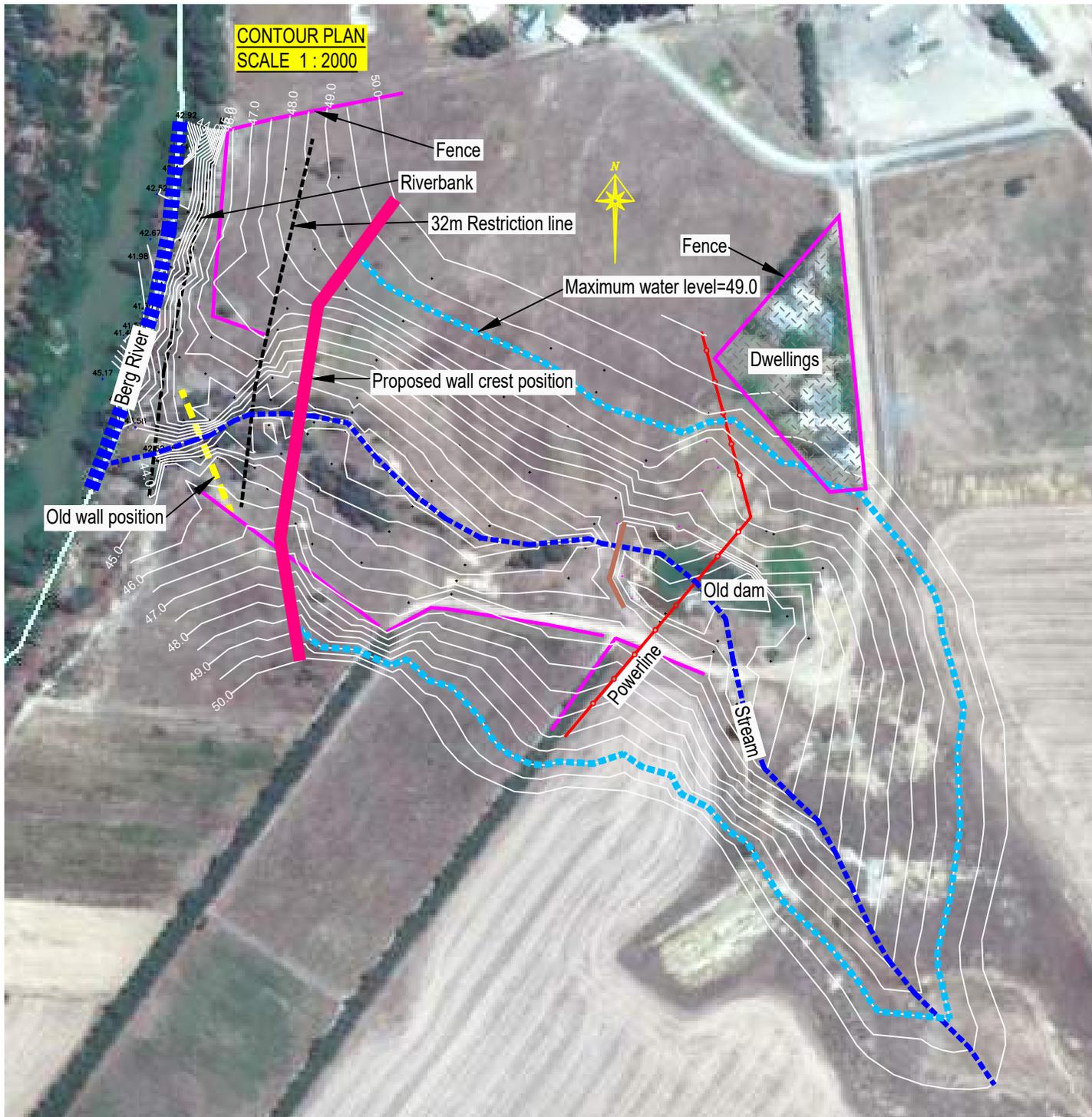
| OWNER INFORMATION   |                         |
|---------------------|-------------------------|
| <b>Owner 1 of 1</b> |                         |
| Type                | COMPANY                 |
| Name                | GRAVENHOLM PROP PTY LTD |
| ID / Reg. Number    | 200102151407            |
| Title Deed          | T69379/2007             |
| Registration Date   | 2007/08/30              |
| Purchase Price (R)  | CCT                     |
| Purchase Date       | -                       |
| Share               | 0.00                    |
| Microfilm           | 2008 0529 3441          |
| Multiple Properties | NO                      |
| Multiple Owners     | NO                      |

| ENDORSEMENTS (7) |                  |                                       |            |                |
|------------------|------------------|---------------------------------------|------------|----------------|
| #                | Document         | Institution                           | Amount (R) | Microfilm      |
| 1                | B2259/2001       | FIRSTRAND BANK LTD                    | 600,000    | 2004 0656 5042 |
| 2                | B49447/1998      | FIRST NAT BANK OF SOUTHERN AFRICA LTD | 1,000,000  | 2004 0656 5031 |
| 3                | B50289/2004      | FIRSTRAND BANK LTD                    | 1,000,000  | 2004 0656 5057 |
| 4                | B35082/2008      | FIRSTRAND BANK LTD                    | 2,000,000  | 2008 0529 3374 |
| 5                | CONSOLIDATE FROM | TULBAGH RD , 88 ,                     | UNKNOWN    | 0000000*       |
| 6                | B35899/2013      | FIRSTRAND BANK LTD                    | 2,000,000  | -              |
| 7                | B7766/2015       | FIRSTRAND BANK LTD                    | 4,500,000  | -              |

| HISTORIC DOCUMENTS (1) |             |       |            |                |
|------------------------|-------------|-------|------------|----------------|
| #                      | Document    | Owner | Amount (R) | Microfilm      |
| 1                      | B82182/2007 | -     | 455,000    | 2008 0777 5630 |

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|  |          |                   |        |
|--|----------|-------------------|--------|
|  <b>SAREL BESTER ENGINEERS</b><br>Consulting Civil Engineers<br>Architectural Service                               |          |                   |        |
| Date: 25/5/2018<br><b>MC BESTER</b><br>Pr. Eng., B.Eng., MSAICE 970598, MSACAP-T1218<br>P.O. Box 21, Lyell Street 62, CERES, 6835<br>Ph: 023-312 2017 * Fax: 023-312 3802<br>e-mail: admin@sbsri.co.za |          |                   |        |
| CLIENT: Grassroots Group<br>P.O. Box 16<br>GOUDA 6821  |          |                   |        |
| PROJECT:<br><b>PROPOSED DAM ON THE FARM<br/>         GROENVLEI, GOUDA</b>  |          |                   |        |
| DETAIL:<br><b>Contour Plan (Aerial Photo)</b>  |          |                   |        |
| DRAWN  | DATE     | SCALE             | SHEET  |
| SC Hartzenberg   | MAY 2018 | as shown          | 1 of 1 |
| SURVEYED   | DESIGNED | DWG. NR.          | REV.   |
| SC Hartzenberg<br>S Le Roux  | N/A      | <b>1815-S1-01</b> |        |
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