

Verw: 1921DDR-S2

Datum: 13 Des 2019

Messrs Howbill Farming
PO Box 146
Ceres
6840

Attention: Messrs Ernst Van Dyk & Theo van Rooyen

**PRELIMINARY DESIGN REPORT FOR THE PROPOSED KLEINVLEI DAM ON KLEINVLEI 209,
PORTION 1, DISTRICT CERES, HOWBILL FARMING**

Your instruction about going ahead with the process with regard to the water use licence application, the activation of the environmental impact assessment as well as the preliminary design of the proposed Kleinvlei dam during the meeting held on 26 July 2019, refers.

1. BACKGROUND

The preliminary design of a dam normally follows after the scoping or feasibility stage during which the position, basic layout as well as the intended storage capacity range along with the initial costing have been determined. This will then serve as the basis for the final dam design and contract specifications in line with dam safety regulations in terms of chapter 12 of the National Water Act, 1998 (Act 36 of 1998).

In addition to the aforementioned, before a "Licence to Construct" can be issued, an "*Environmental Authorisation (EA)*" as well as a "*Water Use License*" have to be obtained from the respective authorities. In order to address these two aspects, a preliminary dam design is required containing specific technical information on the dam, which then serve as supportive documentation to the respective applications.

The proposed Kleinvlei dam will have a total storage capacity of approximately 235 000m³ and it would exclusively be filled with an existing water use, namely winter water from the Houdenbeks River as been included and motivated by the validation & verification process. The existing water use however, has been utilised before by abstracting directly from the Houdenbek River during summer months to sustain an annual 50% vegetable rotation of about 58ha in total. With the proposed Kleinvlei dam, they will create the opportunity to store winter water for summer irrigation during times when the Houdenbeks river nearly runs dry.

The concerned water taking has been managed by the *Koue Bokkeveld Water User Association* and they are aware and in favour of this application.

Construction of Kleinvlei dam will thus not only benefit and protect the summer flow in the Houdenbeks river but it would also give the opportunity for the BEE entity to become a stable self-sufficient economical entity. It will therefore maintain and ensure the beneficial effect on the broader economy by providing permanent jobs, something that is very important in the socio-economic status of previously disadvantaged groups in the surrounding local communities.

The licence application (WULA) therefore basically entails the switching of an existing summer water use to a winter water use and the 'storing' thereof for summer irrigation.

The proposed site is located between the Skurwe- and Sandberg mountains, about 5km south south-east of the town Op-Die-Berg as the crow flies and as shown on **Appendix A**.

2. ASSIGNMENT

Sarel Bester Engineers has been appointed as the project engineer and coordinator overseeing the various actions and components regarding legal requirements as well as the design of the dam while also handling the Water Use Licence Application (WULA).

Instruction and appointment was received to continue with the preliminary design stage for licensing purposes. The Environmental Impact Assessment (EIA) in accordance with the NEMA guidelines, is currently in progress under the care of **EnviroAfrica**. The WULA is also in progress under care of our office, **Sarel Bester Engineers**.

The preliminary design normally follows after and is partially based on the outcome of the scoping & feasibility study. In addition to this, the preliminary design calculations would normally be based on actual contours generated from an official survey compared to those typically obtained from GIS data used in the desk-top study. This assignment therefore takes it further by focussing on certain design as well as certain legal implications included in the first round of concept design drawings.

Surveyed data was converted to the WGS84 universal world map grid in order to relate and overlay it onto the world map for referencing purposes.

Part of the preliminary design process includes checking, verifying and updating information obtained from previous documentation as and where required and applicable with regard to storage capacity, expected earthworks quantities as well as the costing of the project for this purpose.

The intention and purpose of the Preliminary Dam Design Report is and will be used to:

- inform you as client of the concerned investigation regarding storage options along with provisional cost estimations,
- serve as supporting technical appendix to DWS for the water use license application,
- serve as technical appendix to DEADP for the environmental impact assessment, and
- serve as a basis to DWS Dam Safety Office for classification and APP matters.

3. APPLICATION & MOTIVATION

The first phase of activation of the WULA is running parallel to this preliminary design phase and will soon be submitted to DWS (Bellville). The application principles and motivation will be dealt with in full as a separate technical report, hopefully to be finalised & submitted early 2020 as allowed for by the eWULAAS system and which will be available on request when completed and submitted.

This application is based on an existing summer water use (ELU) in the form of surface water directly abstracted from the Houdenberg river as set out in the *Validation and Verification* documentation. The Houdenbeks river as such falls under the jurisdiction of the Koue Bokkeveld Water User Association. This particular summer abstraction will be switched or exchanged for winter abstraction with the key motivation to store winter water for summer irrigation, also benefiting and ensuring the protection of the Houdenberg river during the dry summer months when the water levels fall drastically.

This property was purchased in 2016 by the applicant, **TSR Boerdery (Pty) Ltd**, a 51% BEE owned entity who would like to ensure the existing water use for permanent cultivars by creating winter storage capacity.

The dam site is located within the Houdenberg River catchment being part of the larger Olifants-Doorn system. The use of the water as well as the construction of the proposed Kleinvlei dam should have no negative effect on the downstream users since it is based exclusively on an existing taking which was executed on the property.

Other motivational information as required in terms of Section 27 of the National Water Act, forms part of and is included in the WULA being submitted separately.

4. ALTERNATIVES

Farm 209 portion 1, also known as Kleinvlei, is a relatively small property situated within the Koue Bokkeveld area with a rather mountainous topography towards the eastern side with limited potential dam site options, also due to the existing orchards, other development and infrastructure. However, the only potential dam site was surveyed and three wall options were investigated. We refer to Dam Options 1, 2 & 3 covered in the Feasibility Report, **1921DDR-S1**, dated 5 June 2019 where Options 1 and 3 were declined because of poor storage ratios and bad overall economy.

5. WATER AVAILABILITY

The deeds information regarding the relevant property as well as the water use information which was submitted to DWS (Bellville) soon to be finalised by their *Validation & Verification* process, had been evaluated for purposes of this report. We refer to **Appendices B1 & B2**.

A) Existing Water Uses:

Taking:

- Surface Water - summer use: $\pm 279\,000\text{m}^3$ (Houdenbek River)

Storing:

- None

B) This Licence Application (Storing):

- Proposed Kleinvlei Dam: $\pm 235\,000\text{m}^3$ (switched from summer use)

6. DAM SAFETY & CLASSIFICATION

The project entails the proposed Kleinvlei Dam and one of the first steps in the process is to have the proposed dam classified in terms of dam safety regulations. The application was submitted on 20 November 2019 to the Dam Safety Office, and we await the official classification. Refer **Appendix B3**.

7. ENVIRONMENTAL IMPACT

Government Notices R385, R386 & R387 of 21 April 2006, issued under Chapter 5 of the National Environmental Management Act, 1998 (Act 107 of 1998), also known as the "NEMA" procedures determine that Kleinvlei Dam does trigger certain environmental aspects and therefore qualifies for a full Environmental Impact Assessment (EIA). The study and application is currently under way under the auspices of **EnviroAfrica**.

8. EMPOWERMENT

The applicant, **TSR Boerdery (Pty) Ltd**, a 51% black owned BEE company that was established in 2015, bought the concerned property in 2016. Project **Kleinvlei** is a land reform project established in terms of the Witzenberg PALS (Partners in Agri Land Solutions) framework. Witzenberg PALS is a private land reform initiative based on the principals of Chapter 6 of the National Development Plan. The initiative is supported by all spheres of Government in terms of which land is transferred and commercial farmers partners with black farmers. The aim is to empower the workforce by donating land and establishing an entity that will own and farm the land. The objective is to improve the broader work force's socio economic circumstances and establishing successful black commercial farmers.

Mr RJ Gibson, in his capacity as one of three directors of **TSR Boerdery** agreed on a Mentorship Programme with the other two BEE directors, namely *Mr & Mrs van Rooyen* with the aim to mentor the black shareholders and farmers to become successful black commercial farmers and businessmen, thereby supporting the goal to promote successful agricultural land reform. *Mr Gibson* will further help manage the Kleinvlei farming entity through his team in terms of a Management Agreement to ensure that the BEE project is managed according to best practices and the necessary skills is transferred to the black shareholders.

The aim of the project is to establish ± 30 ha of fruit orchards on the recently bought portion that only consisted of grazing fields before, and therefore not only economic growth will be promoted, but about 17 additional permanent employment opportunities will be generated in the process for a community that urgently needs it.

9. STATUTORY REQUIREMENTS

Various other statutory requirements might be applicable or of importance depending on site specific conditions apart from the regulations already dealt with above.

In this case the only limitations to be dealt with would be the farm borders and farm roads being accommodated elsewhere.

10. HYDROLOGY

The dam site lies within the E21D quaternary catchment under the auspices and care of DWS Olifants-Doorn catchment. This is an in-stream dam situated in the southern part of the quaternary catchment, near the origin of the Houdenbeks river as shown on **Appendix C**. Although the proposed dam has its own local catchment, it would primarily be filled with water to be pumped from the Houdenbeks River itself because of little availability from its own catchment due to other existing lawful uses (ELU's) in the sub-catchment. For this reason a full hydrological study regarding the availability of water is considered unnecessary and neither required for purposes of this report.

Nevertheless, for the sake of completeness, the catchment characteristics according to the **Water Resources of South Africa, WR2012**, by the Water Research Commission (WRC) in conjunction with Department Agriculture in cooperation with Elsenburg, are shown in the table below.

Table 2 shows the local catchment information in relation to the quaternary drainage area:

Catchment (ELSENBURG Catchment Delineation Tool)	Quaternary:	Local Catchment (Pro-rata)	Local Catchment (Elsenburg)
Name / Description	E21D	Kleinvlei Dam	Kleinvlei Dam
Area [km ²]	242	4.5	4.3
Mean Annual Rainfall (MAP) [mm]	627	627	640
Mean Annual Run-off (MAR) [mm]	193	193	123
Gross Average Run-off (MAR) [x 10 ⁶ m ³]	46.71	0.87	0.53

11. SPILLWAY DESIGN CRITERIA

Kleinvlei Dam is in the process of being classified. Given the wall height of ± 8 m and the R303 main road directly downstream of the dam, we assume the classification to be **Small Category II** dam with a **Significant** Hazard Potential for purposes of this report.

Guidelines for the determination of appropriate flood sizes appears in SANCOLD "Guidelines on Safety in Relation to Floods", (Report 4, SANCOLD, December 1991) as follows:

Refer to Table 5.4 for Suggested Recommended Design Flood return periods (years) ~ UNROUTED

Dam Size Class	Hazard Rating		
	Low	Significant	High
Small	20 - 50	100	100
Medium	100	100	200
Large	200	200	200

Note, Based on the assumed classification for purposes of this report and the table above the spillway system of Kleinvlei Dam should be designed for the RDF equal to the **1:100 year** flood peak.

Various methods are normally used based on the SANCOLD guidelines and in this case the proposed **RDF (Unrouted)** is the equivalent of the 1:100 flood to the value of $\pm 43,3 \text{ m}^3/\text{s}$. However, the final design does take this to a next level by routing the flood through the dam basin which normally reduces the flood peak to the so-called **RDD (Routed)**. In this case we expect the reduction to be substantial.

12. GEOLOGY

According to the Geological Survey of South Africa, the proposed site is situated within the Ceres & Nardouw Sub-groups which form part of the Bokkeveld & Table Mountain Groups, both being part of the larger Cape Supergroup as shown on **Appendix D**. These geological formations on and surrounding the site is described as follows:

Dh	~ Light-grey feldspathic sandstone, subordinate siltstone; gritstone and conglomerate
Dt	~ Micaceous, sandy shale and mudstone; alternating siltstone and minor sandstone
Db	~ Light-grey feldspathic and micaceous sandstone; subordinate shale; siltstone
Dv	~ Dark-grey fossiliferous shale, mudstone and siltstone, thin sandstone beds
Dg	~ Black to dark-grey fossiliferous shale, mudstone and siltstone
Dga	~ Dark-grey, rather lithic and feldspathic sandstone and siltstone; subordinate shale and conglomerate

The overall geology around the site is that of a complex strip configuration with many parallel running contact planes between the formations.

The footprint of the proposed dam walls would primarily fall on or across the contact planes between the Dh, Dt & Db formations described above mostly variations between sandstone, siltstone and shale. This in itself can lead to seepage problems which can be difficult to treat. Typically shale and sandstone formations in general can be regarded as suitable for dams of this nature and magnitude. However, depending on the fractured nature thereof, the general permeability of the dam basin can be jeopardised when it comes to sealing the core trench foundations. This requires further investigation during the design process.

In addition to the variation in formations there are a few geological features like fault-lines as well as strikes & dips of strata some distance south from the proposed sites indicated on the map which only requires mentioning for now. At this stage we don't foresee any particular 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. However, dams in the vicinity is constructed of similar material and their behaviour over time is considered consistent and stable giving confidence in the proposed works.

Overall it would be considered better and less risky if the wall alignments can be arranged parallel to rather than crossing the contact planes between various formations.

13. SITE PROFILE

The Water Research Commission have recently launched their updated study of the Water Resources of South Africa replacing the previous versions thereof dated 1990 & 2005. The updated web-based information system, <waterresourceswr2012.co.za> launched in 2016, is well recommended by the Department of Water & Sanitation and also widely used throughout South Africa as basis when it comes to water management and development issues.

The table below shows a summary of such characteristics or profile regarding the proposed dam site.

Figure	Property Description	Zone / Index / Value	Unit / Scale
Figure 0	Water Management Area	17 ~ Olifants/Doorn	
Figure 1	Rainfall: MAR	400-500	[mm]
Figure 2a	Evaporation (WR90 S-pan)	1600-1700	[mm]
Figure 2b	Evaporation (A-pan)	2000-2200	[mm]
Figure 3	Runoff: MAR	100-200	[mm]
Figure 4a	Landcover	Irrigated areas	
Figure 6	Simplified Geology (WR90)	Intercalated arenaceous and argillaceous strata	
Figure 7	Soils (WR90) [Depth / Texture / Relief]	Moderate to deep / Sandy loam / Steep	
Figure 8	Sediment (WR90) [Erodibility Index]	15~ Medium	High 1-8 Medium 9-15 Low 16-20
Figure 9	Vegetation (Acocks Veld Types)	Sclerophyllous bush types	
Figure 10	EWR Management Class	Class E-F Not an acceptable class	[A-F]
Figure 11	Surface Water Quality - TDS	>2000	[mg/l]
Figure 12	Population Density	0-100	[People / km ²]
DWAF GRA2	Utilisable Groundwater Exploitation Potential	25 001-50 000	[m ³ /km ² /a]

All of the above properties and/or characteristics are within an acceptable range for when it comes to building a dam and the overall observation and interpretation thereof does not raise any alarms which could potentially impact the design and construction of a dam of this nature.

14. CONCEPTUAL DESIGN

The project entails the design and construction of the proposed Kleinvlei dam as a zoned earthfill embankment across the valley including an open channel spillway provisionally against the northern bank plus a pipe outlet under the central embankment. Die preliminary design drawings are included in **Appendix F**.

A) Design Characteristics:

The proposed dam is considered an in-stream dam with a straight alignment across the valley with the following characteristics:

Location:	33° 04' 02.00" 19° 19' 57.59"E
KLEINVLEI DAM	
Wall crest level (masl)	970.7
Full supply level (masl)	969.2
Lowest ground level (masl)	962.3
Max wall height (m)	8.40
Crest length (m)	154.30
Crest width (m)	4.0
Upstream slope	1 : 3
Downstream slope	1 : 2
Free board (m)	1.5
Embankment volume (m ³)	10,400
Total earthworks (m ³)	13,300
Nett storage capacity (m ³)	235,000
Flooded area (ha)	12.00
Total footprint (ha)	13.00

- B) Foundation: Preliminary visual inspections shows a topsoil layer varying between $\pm 0,3\text{m}$ and $\pm 0,5\text{m}$ thick on a sandy to gravelly layer between $\pm 1,0$ to $\pm 3,0\text{m}$ thick on shale or sandstone formation. The formations are considered adequate and suitable for this type of structure.
- C) Material investigation: No formal in-depth soil analyses has been done as yet. Other dams in the vicinity is of similar material and their behaviour over time is considered adequate and stable. The more gravelly and sandy material will be used as unselected mass fill within the up- and downstream embankment zones or shells while the more clayey material will be incorporated into the central core and cut-off zones. Visual inspection of the proposed dam site provisionally suggests that the availability of material from the dam basin seems to be adequate. Light dispersiveness is expected on these types of material originating from the shale, based on general erosion marks elsewhere in the valley. However, this characteristic will be addressed formally in the final design by way of either chemical stabilisation, increased compaction with built-in sand filters or a combination thereof.
- D) Embankment design: The overall layout is a straight aligned in-stream dam across the valley with the wall crest length of $\pm 155\text{m}$. The proposed internal embankment profile will be zoned with a selected clayey core and cut-off zones plus unselected up- and downstream mass earthfill zones. Awaiting the outcome of the formal soil testing to be carried out for final design purposes, consideration will be given to the necessity and introduction of built-in sand drains. Due to the possibility of dispersiveness, the core and cut-off zones will be compacted to a higher density in the order of 98% Proctor. The planned maximum wall height is in the order of $\pm 8.5\text{m}$ with the upstream slope provisionally set at 1v : 3h, the downstream slope at 1v : 2h and the crest width at 4m.
- E) Drainage: Due to the height and the possibility of dispersiveness, as mentioned above, and pending the outcome of the soil tests, the internal embankment profile might require an optional built-in drainage system in the form of a curtain drain on the downstream side of the

- core plus a blanket drain or evenly spaced strip drains over the downstream solumn area. Apart from this, drainage will also rely on the normal phreatic movement of moisture through the earthfill structure itself.
- F) Stability: This aspect is considered part of the final design exercise when a complete slope and internal stability analysis will be conducted based on the results forthcoming from the specialized soil testing. Pending the outcome of these results, including the stability calculations, the proposed profile has been evaluated against and based upon applicable statistics obtained from a database of dams without any obvious risks being identified at this stage. However, the final design will also include a formal slope stability design based on finite element stability calculation models.
- G) Outlet works: The outlet is currently planned as a single ø250mm class 9 pipe in reinforced concrete with a flanged sluice-gate control valve and manifold on the downstream side. It will also be fitted with a sieve pipe on pedestals or alternatively a custom built float unit at the upstream inlet end. This will be sufficient for irrigation purposes as well as for emptying the dam or lowering the water level in case of an emergency condition, say within 15 days.
- H) Spillway & Flood management: Kleinvlei Dam will be equipped with an open side channel spillway with concrete sill at the right flank leading the flood water safely past and away from the embankment toe and back to the natural drainage path. The erodibility index is 15 on a scale of 1 to 20 with 1 being high and 20 being low, in other words the index is classified as low. The dry freeboard is provisionally set at ±1,5m based on the flood requirements.
- I) Special Requirements: Releasing water for instream flow requirements (IFR) will probably be a requirement of the water use license (WUL) as it is considered an in-stream dam although to be filled by pumping from the Houdenbeks River. However, if required, the outlet of the dam will be equipped with a scour system including a calibrated measuring device if required. This aspect is considered a specialised item and the design thereof will form part of the detail design.
- J) Maintenance and Operation: The dam is situated in a winter rainfall area and will be filled during the winter season primarily with water being pumped from the Houdenbeks River under the auspices of the Kouebokkeveld Water User Association. The operation and supervision of the dam will take place under the direct control of the owners or their delegated authority on a seasonal basis.
- K) Specifications: Relevant and applicable specifications are envisaged for this purpose. It is recommended that the following standardised specifications be considered as basis and part of the construction contract:
- General Conditions of Contract for Construction Works Simplified (2018)
 - SANS/SABS 1200AD: General (Small Dams)
 - SANS/SABS 1200DE: Small Earth Dams
 - SANS/SABS 1200GA: Concrete (Small Works)
 - SANS/SABS 1200L: Medium Pressure Pipeline

15. QUALITY CONTROL

The site surveying, planning, design and construction supervision will be handled by personnel of *Sarel Bester Engineers*. Regular inspections and in-situ compaction tests will be conducted during the construction phase in order to ensure quality of workmanship in accordance with SABS/SANS standards.

16. DOWNSTREAM DEVELOPMENT

The proposed dam is considered an in-stream dam located within the Houdenbek River Catchment, about 0.6km before it confluence with the Houdenbek River itself. About 5km downstream it passes east from the town Op-die-Berg. Except for crossing the main road R303 twice at about 0.2km and 2km respectively, the potential flood area mainly consists of cultivated land with a few farm buildings and minor farm roads. The application for classification is due and was submitted to the Dam Safety Office who will then determine the hazard rating and subsequent clasification.

17. COSTING

The estimated costing of the project is based on recent tender prices of similar type projects within the Western Cape region. Costing of the project was done by using related data from other projects and dividing the sum total of all the earthmoving costs by the sum total of all the bulk earthmoving volumes as an all inclusive bulk unit price for earthmoving. Additional allowance was then made for other costs such as overhead costs, concrete & outlet related costs as well as diverse & unforeseen cost items. The sum total of these give the estimated project cost as set out on the attached preliminary design evaluation sheet summarised below and included as **Appendix E**.

<u>Description</u>	<u>Kleinvlei Dam</u>
Max Wall Height (m)	8.5
Total Earthmoving (m ³)	13,300
Nett Storage Capacity (m ³)	±235 000
Storage : Earthworks	±17.7
Total Estimated Project Cost (R)	±R1,100,000

Kleinvlei Dam entails the construction of a new dam. The storage ratio was calculated as the ratio between the total volume of material to be moved and the storage capacity gained in the proposed dam. In general dam sites are considered more viable or economical when the storage ratio is about 5 and higher. The figures above show the storage versus earthworks ratio in the order of ±18 which is considered highly economical.

In this case, the earthworks costing was calculated at a basic rate of **±R45/m³** accounting for ±65% of the total cost which translates to an estimated project cost in the order of **R0,96mill**, excluding fees etc.

18. SUMMARY

Kleinvlei dam is planned as an in-stream dam situated within a tributary of the Houdenbeks River catchment, about 0,6km upstream of the confluence with the Houdenbek River itself, forming part of the larger Olifants-Doorn River system. The water use licence application is for new storage of an existing summer water use to be transformed into winter abstraction from the Houdenbek River which is acknowledged by the management of the Koue Bokkeveld Irrigation Board. The dam will mainly be filled from the Houdenbek River via an existing pump and pipeline system while plantations will be irrigated directly from the dam during summer periods.

The embankment will be aligned north-south between two ridges with a relative short crest length compared to water storage. The spillway will be relocated higher up against the northern abutment as an uncontrolled open channel with concrete sill at the full supply level. The dam will also be equipped with an outlet pipe encased in concrete under the embankment.

The application is based on existing summer water use to be exchanged for surplus winter water use which could not be utilised in the past due to limited storage capacity. The additional storage of winter water will be used for summer irrigation which in turn will increase the irrigated area by ±30ha.

The license application for the 'storing' of water as well as the environmental impact assessment have both been initiated under the auspices of our offices and those of *Enviro Africa* respectively. The purpose of this document is therefore also to provide certain technical information as part of the above applications to the various authorities.

All taken into account based on proper engineering, the site is considered suitable for a dam of this nature.

19. APPENDICES

- A) Locality Map
- B) Documentation (*Property Information / V&V / Classification*)
- C) Hydrological Map
- D) Geological Map
- E) Preliminary Design Evaluation: Quantities & Costing
- F) Drawing 1921-S2-01; Contour Layout Plan & Construction Detail

You are welcome to contact us in case of uncertainty about the contents or if more information is required about any aspect or component herein.

We trust that you will find the above in order.

Yours faithfully



M Charl Bester (Pr Ing)

Copies to:	Mr C Geyser, <i>Enviro Africa</i> , Somerset West
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WinDeed Database Deeds Office Property



KLEINVLEI, 209, 1 (CAPE TOWN)

GENERAL INFORMATION

Date Requested 2019/10/09 09:39
Deeds Office CAPE TOWN
Information Source WINDEED DATABASE
Reference 1921

**PROPERTY INFORMATION**

Property Type FARM
Farm Name KLEINVLEI
Farm Number 209
Portion Number 1
Local Authority WITZENBERG DC
Registration Division CERES RD
Province WESTERN CAPE
Diagram Deed T30024/1985
Extent 295.4589H
Previous Description -
LPI Code C01900000000020900001

OWNER INFORMATION**Owner 1 of 1**

Type COMPANY
Name K2015028869 SOUTH AFRICA PTY LTD
ID / Reg. Number 201502886907
Title Deed T52028/2016
Registration Date 2016/08/29
Purchase Price (R) 3,534,000
Purchase Date 2015/04/15
Share 0.00
Microfilm -
Multiple Properties NO
Multiple Owners NO

ENDORSEMENTS (4)

#	Document	Institution	Amount (R)	Microfilm
1	K131/1986S	-	UNKNOWN	1986 0231 1288
2	FARM CE 209/1	-	UNKNOWN	1985 0022 0145
3	VA9262/2009	MUN WITZENBERG	UNKNOWN	-
4	VA2388/2016	MUN WITZENBERG	UNKNOWN	-

HISTORIC DOCUMENTS (5)

#	Document	Owner	Amount (R)	Microfilm
1	T19910A/1991	-	UNKNOWN	1991 0570 1261
2	T30024/1985	REGIONAL SERVICES COUNCIL- BREERIVIER	SECT 16	1991 0570 1220
3	T30024/1985	MUN WITZENBERG	SECT 16	1991 0570 1220
4	T30024/1985	DIV-AFD WITZENBERG	SECT 16	1991 0570 1220
5	T63930/2009	-	UNKNOWN	-

**FORMAL APPLICATION FOR THE
VALIDATION AND VERIFICATION OF THE
EXISTING LAWFUL WATER USES IN TERMS
OF THE NATIONAL WATER ACT, 1998**

(Completed formal V&V documentation as received from the Aurecon V&V Team)

**PROPERTY
PORTION 1 OF THE FARM KLEINVLEI 209
DISTRICT OF CERES**

**REGISTERED PROPERTY OWNER
TSR BOERDERY (PTY) LTD**

**WATER USER
TSR BOERDERY (PTY) LTD**

**Contact Person:
Mr Raymond Gibson
Mr Tlan Erasmus
P O Box 146
CERES
6835**

**Tel no.: (023) 317 0823
Fax no.: (023) 317 0821
Cell nr: (082) 575 6005
Email: tlan@howbill.co.za**

MAY 2017

**APPLICATION FOR THE VALIDATION AND VERIFICATION OF
EXISTING LAWFUL WATER USE
IN TERMS OF THE NATIONAL WATER ACT, 1998**

Introduction

Included in this report kindly find the completed and signed Validation and Verification application form for the property, Portion 1 of the farm Kleinvelei 209, located within the District of Ceres.

This property which is registered in the name K2015028869 South Africa (Pty) Ltd. Kindly note that the company K2015028869 South Africa (Pty) Ltd has undergone a name change and is now known as TSR Boerdery (Pty) Ltd. The necessary documentation confirming this name change has been included in this report.

The water user/operating company in respect of this property is TSR Boerdery (Pty) Ltd (ID 2015/028869/07). The VAT no. of this water user is 450 027 0428.

We have included amongst others, as additional information, in respect to the Validation and Verification of the ELU of this property, the following information:

- Property Deed Search;
- Property Diagram;
- Our 2000 Land Use Colour Images- A4-size on which is indicated four additional land parcels which are/were irrigated at the time;
- Certificate confirming name change of the company;
- Copy of the Signatory ID document;
- Letter confirming the signatory's power of attorney to sign the Validation & Verification application on behalf of TSR Boerdery (Pty) Ltd.

Water Resources

The water resources identified and listed below from which all the irrigation water is taken for use on these twenty nine properties are the following:

- Surface Water - Run of River- Houdenbeks River (summer water).

Irrigation Demand

The irrigation water demand for the respective crop cultivated is listed below:

Summer Vegetables 9 500 m³/ha/a

Detail of Properties

Property Description	Registered Owner	Extent (ha)	Title Deed Nr	District
Portion 1 of Kleinvelei 209	#TSR Boerdery (Pty) Ltd	295.4589	T52028/2016	Ceres

previously known as K2015028869 South Africa (Pty) Ltd

Current Water Registration Certificates

No records of current water registration are available.

Summary of Land Use and Lawful Water of Properties

Property Description	Irrigated Area & Crop Type/Year (ha)	Annual Water Use/ Resource Type (m³/a) Scheduled Water (Sch) Surface Water (SW) or Groundwater (GW)	Total Storage/Property (m³)	Number of Dams/Property (nr)
Portion 1 of Kleinvei 209	58.74 ha of Summer Vegetables @ 50% rotation	279 011 m³/a (SW)	Zero	Zero
Totals	58.74 ha/2 = 29.37 ha/year	279 011 m³/a (SW)	Zero	Zero

Storage Dams

There are no storage dams on the property. All the water used and exercised for irrigation use is abstracted from the Houdenbeks River during the summer months.

Summary of Other Water Uses on the Properties

Property Description	Type of Use	Annual Volume Used (m³/a)	Water Resource & Name
Portion 1 of Kleinvei 2089	Domestic	1 500 m³/a	(SW) Houdenbeks River
Portion 1 of Kleinvei 2089	Stock-watering	2 500 m³/a	(SW) Houdenbeks River
	Totals	4 000 m³/a	

SW = Surface Water & GW = Groundwater

Conclusion

We trust that the information supplied is sufficient in order to finalise the Validation and Verification process and proceed with the issue of a certificates of confirmation in respect of the lawful water use of this property, Portion 1 of the farm Kleinvei 209, District of Ceres.

Kindly contact us should you require any additional information in this regard.

Addendums

Addendums included for this property, are:

- Property Deed Search;
- Property Diagrams;
- Our 2000 Land Use Colour Images- A4-size on which is indicated four additional land parcels which are/were irrigated at the time;
- Certificate confirming name change of the company;
- Copy of the Signatory ID document;
- Letter confirming the signatory's power of attorney to sign the Validation & Verification application on behalf of TSR Boerdery (Pty) Ltd.

Mr Raymond J Gibson
Director: TSR Boerdery (Pty) Ltd

Date: 16 May 2017

**COMPLETED & SIGNED
V&V APPLICATION FORM**



water & sanitation

Department
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

Portion 1 of Kleinvlei 207

CECEJ RD

WESKAAP

Privaatsak X16, Sanlamhof, 7532. Voortrekker Straat 52, Beilville

An English version is available on the next page.



Meneer / Mevrou

Die bepaling van die Bestaande Wettige Watergebruik op eiendom binne die Berg-Olifantswaterbestuursgebied (WBG)

Die Departement van Water en Sanitasie (DWS) is regoor Suid-Afrika besig met die Validasie en Verifikasie (V&V) proses om die Bestaande Wettige Watergebruik (BWW) in terme van Artikel 35 van die Nasionale Waterwet, (Akte 36 van 1998) (NWW) te bepaal.

'n **Riglyndokument** vir watergebruikers is ook aan u gestuur. Dit bevat die volgende belangrike inligting:

- Agtergrondinligting oor die wettige proses wat van toepassing is op die bepaling van BWW.
- Besonderhede van opedagvergadering datums.
- Kontakbesonderhede vir die indiening van voltooide getekende vorms.
- Besonderhede oor die V&V webtuiste, www.VandVms.co.za, wat nuttige inligting tot die proses bevat.

Die BWW sal slegs vir die volgende watergebruike bepaal word:

- Artikel 21(a): Neem van water vanuit 'n waterhulpbron
- Artikel 21(b): Opgaring van water
- Artikel 21(d): Deelname aan 'n stroom vloei vermindering aktiwiteit (kommersiële bosbou).

Die volgende onder u beheer val binne die Berg-Olifantsrivier WBG, waarvoor u vir elk 'n soortgelyke vorm moet ontvang

• C0190000000020900001 - 933006 -

Gedeelte nommer/ Plaas nommer

Hierby ingesluit is 'n gedeeltelik voltooide vorm met inligting wat verkry is vanaf bestaande watergebruik registrasies, ontledings en berekeninge gebaseer op lugfoto's wat kort na die implementering van die NWW geneem is. U word versoek om die inligting noukeurig te bestudeer aangesien dit 'n impak op die BWW het. U word hiermee uitgenooi om 'n opedagvergadering by te woon waar die V&V proses verduidelik sal word. U sal die geleentheid gegee word om direk met die DWS-verteenwoordigers in gesprek te tree. 'n Lys met al die datums en vergaderplekke is in die riglyndokument ingesluit.

Voltooi asseblief enige ontbrekende inligting op die vorm. Veranderinge, gemotiveer deur ondersteunende dokumente, kan deur die watergebruiker voorgestel word.

Gedeelte 6 van die vorm, "Aansoek vir Verifikasie", moet deur die watergebruiker onderteken en teen ingedien word, ten einde 2016-12-11 die aansoek te verwerk en die watergebruik formeel te erken. Aurecon Suid-Afrika (Edms.) Bpk. is deur die DWS aangestel om die Berg-Olifants Proto Opvanggebiedbestuursagentskap (OBA) met die V&V proses in die Berg-Olifants WBG by te staan.

Let asseblief op die volgende belangrike inligting wat spesifiek tot u relevant is:

- **Eiendom waarop die watergebruik in hierdie vorm van toepassing is:** C0190000000020900001 - 933006
- **Die watergebruiker se unieke wagwoord op die webtuiste toegang tot inligting rakende watergebruik op hierdie eiendom te verkry:** -

Indien u nie die geskeduleerde opedag vergaderings kan bywoon nie of indien u meer inligting benodig, kontak Annemie Mynhardt by 021 526 9400 of stuur 'n e-pos na wateruse@arecongroup.com of 'n faks na 086 560 5068.

Die uwe

Ashia Petersen
Waarnemende Hoof Uitvoerende Beampte Berg-Olifants Proto-OBA
DEPARTEMENT VAN WATER EN SANITASIE
Datum: 2016-11-11



water & sanitation

Department
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

WESTERN CAPE

Private Bag X16, Sanlamhof, 7532. 52 Voortrekker Road, Bellville

Sir / Madam

Determining the Existing Lawful Water Use on properties within the Berg-Olifants Water Management Area

The Department of Water and Sanitation (DWS) is undertaking a validation and verification (V&V) process across South Africa to determine the Existing Lawful Water Use (ELU) in terms of Section 35 of the National Water Act, (Act 36 of 1998) (NWA).

A **Guideline Document** for water users has also been sent to you. It contains the following important information:

- Background information on the legal process applicable to determine ELU.
- Details of open day meeting dates and venues.
- Contact details for submission of completed signed forms.
- Details on the V&V website, www.VandVms.co.za, which contains useful information on the process.

The ELU will be determined for the following types of water use only:

- Section 21(a): Taking water from a water resource
- Section 21(b): Storage of water
- Section 21(d): Engaging in a stream flow reduction activity (commercial forestry)

The following properties under your control within the Berg-Olifants WMA, for each of which you should receive a similar form:

- C0190000000020900001 - 933006 - Portion number/ Farm number

The forms enclosed with this letter are partially completed with data obtained from existing water use registered, analysis and calculations done based on aerial photography taken shortly after the implementation of the NWA. You are requested to review the data which will have an impact on the ELU.

You are hereby invited to attend an open day meeting where the V&V process will be explained. At the open day meeting, you will have the opportunity to interact directly with the DWS representatives. The open day schedule is included in the Guideline Document.

Please complete the forms attached, and confirm the information provided. Amendments may be proposed with motivations and supporting documents.

Section 6 of the form, "Application for Verification" is compulsory and must be signed by the water user and returned by 2016-12-11 in order for the application to be assessed and the water use formally verified. Aurecon South Africa (Pty) Ltd was appointed by the DWS to assist the Proto Catchment Management Agency (CMA) with the V&V process in the Berg-Olifants WMA.

Please note the following information relevant to you,

- **Property on which water use is being addressed in this form:** C0190000000020900001 - 933006
- **Water User website unique password to access information relating to water use on this property:**

If you are unable to attend the scheduled open day meetings or need more information you can contact Annemie Mynhardt at 021 526 9400 or send an e-mail to wateruse@aurecongroup.com or a fax to 086 560 5068.

Yours sincerely

Ashia Petersen
Acting CEO: Berg-Olifants Proto-CMA
DEPARTMENT OF WATER AND SANITATION
Date: 2016-11-11

1 Property Information**Besonderhede van Eiendom**

Registration division <i>Registrasie afdeling</i>			C019 ✓
Farm name <i>Naam van plaas</i>	KLEINVLEI Nr 209	✓	
Portion number / farm number <i>Gedeeltenommer / plaasnommer</i>			1/209 ✓
Property extent (ha) <i>Groote van eiendom (ha)</i>	295.4589 HA	✓	
Name of owner <i>Naam van eienaar</i>	TSR BOERDERY (PTY) LTD	✓	
Company Reg / CC / ID number <i>Maatskappyreg / BK / ID nommer</i>	2015/028869/07	✓	
Title deed number <i>Titelakte nommer</i>	T52028/2016	✓	
Title deed date <i>Datum van titelakte</i>	29 AUGUST 2016	✓	

2 Water User Information**Besonderhede van Watergebruiker****2.1 Water User Details****Besonderhede van Watergebruiker**

Registered user type <i>Registreerbaarheid van geregistreerde watergebruiker</i>		Individual (Complete Section 2.2) / <i>Individu (Voltooi Gedeelte 2.2)</i> Company (Complete Section 2.3) / <i>Maatskappy (Voltooi Gedeelte 2.3)</i>
Postal address <i>Posadres</i>	P O BOX 146, CERES, 6835	✓
Physical address <i>Fisiese adres</i>	PLAAS KLEINVLEI, KOUE BOKKEVELD, CERES	✓
Telephone number <i>Telefoon nommer</i>	023-3170823	✓
Fax number <i>Faks nommer</i>	023-317 0821	
Cell number <i>Selfoon nommer</i>	0825755006	✓
Email <i>E-posadres</i>	TIAN@HOWBILL.CO.ZA	✓

2.2 Details of Individual



Only complete this section if the registered water user is a natural person. A copy of the water user's ID document must accompany the returned submission.

Besonderhede van Individue

Hierdie gedeelte moet slegs voltooi word indien die geregistreerde watergebruiker 'n individu is. 'n Kopie van die watergebruiker se ID dokument moet saam met die voltooiëde vorm ingedien word.

Title of water user
Titel van watergebruiker

Initials of water user
Voorletters van watergebruiker

Surname of water user
Watergebruiker se van

ID or passport number
ID nommer of paspoortnommer

Vat number (if applicable)
BTW nommer (in van toepassing)

Country where passport was issued
Land wat paspoort uitgereik het

Gender
Geslag

Population group of water user
Etniese groepering van watergebruiker

Male / Manlik

Female / Vroulik

Black / Swart

White / Blank

Coloured / Bruin

Indian / Indiër

2.3 Company Details



Only complete this section if the registered water user is a company. A copy of the water user's company registration document must accompany the returned submission.

Besonderhede van Maatskappy

Hierdie gedeelte moet slegs voltooi word indien die geregistreerde watergebruiker 'n maatskappy is. 'n Kopie van die watergebruiker se maatskappyregistrasiedokument moet saam met die vorm ingedien word.

Company name
Naam van maatskappy

TSR BOERDERY (PTY) LTD

Company Reg number / CC number
Maatskappy Reg number / BK nommer

2015/028869/07

Date company was established
Stigtingsdatum van maatskappy

11/02/2015

Country in which company was established
Land waar maatskappy gestig is

RSA

VAT number
BTW nommer

4500270428

Contact person name
Naam van kontak persoon

TIAN ERASMUS

2.4 Contact Person Details

Besonderhede van Kontak Persoon



Only complete if the Contact Person's details are different from the Water User's details above.

Voltooi slegs indien die Kontak Persoon se besonderhede verskil van die Watergebruiker hierbo s'n.

Name of contact person
Naam van kontak persoon

Telephone number
Telefoon nommer

Cell number
Selfoon nommer

Email address
E-posadres

Mr Tiqu ERAMWA

0741673542

092 575 5006

tiqwa howbill. co. za

3 Reference Information

Verwysing Inligting



This section lists reference information available to DWS. Review and edit where necessary and provide supporting documents for motivation.

Hierdie afdeling bevat inligting wat DWS beskikbaar het. Hersien en wysig indien nodig met ondersteunde dokumente ter motivering.

3.1 Irrigation Board Allocation

Besproeiingsraad Toekenning



Reference is made to Irrigation Board allocation only.

Verwys slegs na Besproeiingsraad toekennings.

Irrigation board name
Naam van besproeiingsraad

Scheduled area (ha)
Ingelyste oppervlakte (ha)

Quota / Water use rate
(m³/ha/year)
Kwota / Watergebruik per eenheid
(m³/ha/jaar)

Authorised volume (m³)
Inlysting volume (m³)

NOT APPLICABLE

3.2 WARMS Registrations

WARMS registrasies

3.2.1 Taking of Water

Neem van water

Registration number
Registrasie nommer

Water resource type
Tipe waterbron

Resource name
Naam van bron

Water use sector
Watergebruik sektor

Registered volume (m³)
Geregistreerde volume (m³)

NO INFORMATION AVAILABLE

3.2.2 Storage

Opgaar van Water

Registration number
Registrasie nommer

Dam name
Naam van dam

River name
River naam

Registered volume (m³)
Geregistreerde volume (m³)

NO INFORMATION AVAILABLE

3.2.3 Stream Flow Reduction Activity**Stroomvloeivermindering Aktiwiteit**

Stream flow reduction activities refer to commercial forestry plantations.

Stroomvloeiverminderingsaktiwiteite verwys na kommersiële bostouplantasies

Registration number <i>Registrasie nommer</i>	Type of trees in plantation <i>Tipe bome in plantasie</i>	Name of nearest river <i>Naam van naaste rivier</i>	Area (ha) <i>Oppervlakte (ha)</i>	Water use rate (m ³ /ha/year) <i>Watergebruik per eenheid (m³/ha/jaar)</i>	Registered volume (m ³) <i>Geregistreerde volume (m³)</i>
NO INFORMATION AVAILABLE					

3.3 Dam Safety Registrations**Dam Veiligheids Registrasies**

DSO Number <i>DVK nommer</i>	Dam Name <i>Naam van Dam</i>	Capacity (m ³) <i>Kapasiteit (m³)</i>
NOT APPLICABLE		

3.4 Other authorisations-9B permits, etc**Ander magtings-9B permitte, ens**

Please enter details of any other water use authorisation you have. Please attach a full copy of the water use authorisation document.

Voltooi besonderhede van enige ander watergebruik magtiging waarop u beskik. Dien asseblief 'n afskrif van die watergebruiksmagtiging saam met die voltooide dokument in.

Authorisation type <i>Tipe magtiging</i>	Nature of water use (e.g. taking of water from a water source, storage, etc.) <i>Doel van watergebruik (Neem van water van 'n bron, opgarng, ens.)</i>	Permit number <i>Permit nommer</i>	Permitted volume (m ³) <i>Toeelate volume (m³)</i>
NOT APPLICABLE			

4 Actual Water Use

Actual Water Use



This section lists the actual average annual water use during the qualifying period.

Hierdie gedeelte dui die werklike gemiddelde jaarlikse watergebruik gedurende die kwalifiserende periode aan.

4.1 Taking of water

Neem van water

4.1.1 Taking of water for Irrigation

Neem van water vir bespoeiing

Field number on map Veldnommer op kaart	Irrigated Besproei	Crop type * Gewas tipe *	Area (ha) Oppervlakte (ha)	Rotation factor (%) Rotasiefaktor (%)	Water use rate (m ³ /ha/year) Watergebruik per eenheid (m ³ /ha/jaar)	Volume (m ³ /year) Volume (m ³ /jaar)
C1	✓	VEGETABLES	1.47	50 %	9500	6982
C2	✓	VEGETABLES	12.76	50 %	9500	60 610
C3	✓	VEGETABLES	3.85	50 %	9500	18 287
C4	✓	VEGETABLES	3.87	50 %	9500	18 582
C5	✓	VEGETABLES	5.10	50 %	9500	24 225
C6	✓	VEGETABLES	6.15	50 %	9500	29 212
C7	✓	VEGETABLES	2.39	50 %	9500	11 352
C8	✓	VEGETABLES	5.37	50 %	9500	25 507
Total irrigated (m ³ /year) Totale besproeiing (m ³ /jaar)						

Crop types are:

Gewastipes is:

Citrus
Sitrus
Vegetables
GroenteDeciduous Fruit
Sagte Vrugte
Wheat
GraanGrazing
Weiding
Wine Grapes
WyndruiweLucerne
LusernPotatoes
AartappelTable Grapes
Tafeldruiwe

C9	✓	VEGETABLES	2.45	50 %	9500	11 637
C10	✓	VEGETABLES	8.07	50 %	9500	38 332
C11	✓	VEGETABLES	2.38	50 %	9500	11 305
C12	✓	VEGETABLES	4.88	50 %	9500	23 180

TOTALS 58.74 ha

279 011 m³/a

50% Rotation = 2937 ha of
VEGETABLES PLANTED AND HARVESTED
PER YEAR

4.1.2 Taking of water for other purposes

Neem van water vir ander doeleindes

4.1.2.1 Feedlots

Animal type Tipe diere	Number of animals Aantal diere	Water use rate (m ³ /year) Watergebruik per eenheid (m ³ /year)	Volume (m ³ /year) Volume (m ³ /year)
Cows & Sheep		Still - watering	2500 m ³ /a
Total Totaal			2500 m ³ /a

4.1.2.2 Domestic water use

Number of households Aantal huishouding	Water use rate (m ³ /year) Watergebruik per eenheid (m ³ /year)	Volume (m ³ /year) Volume (m ³ /year)
Domestic Use		1500 m ³ /a
Total Totaal		1500 m ³ /a

4.1.2.3 Industrial water use

Type of industry Tipe nywerheid	Details of water use Detail van watergebruik	Volume (m ³ /year) Volume (m ³ /year)
Total Totaal	not applicable	

4.1.3

Water Sources



The table below reconciles water taken from sources with water used. For water obtained via an Irrigation Board, only state the actual volume used. The full allocation will be used when calculating the ELU.

Waterbronne

Die tabel hieronder moet voltooi word om water uit die onderskeie waterbronne met watergebruik te rekonsilieer. Vir water vanaf 'n besproeiingsraad, dui net die werklike volume wat van u Besproeiingsraadtoekenning inlysting gebruik was. N.S. Die volle toekenning van die Besproeiingsraad skedule sal gebruik word om die BWV te bereken.

Sector Sektor	Annual volume actually used (m ³ /year) Jaartikse volume eintlik gebruik (m ³ /jaar)			Total Totaal	Notes Notas
	Surface water Oppervlak water	Groundwater * Grondwater *	Irrigation Board Besproeiingsraad		
Agricultural irrigation Landboubesproeiing	279 011 m ³ /a	Zero	Zero	279 011 m ³ /a	Total 4.1.1 Totaal 4.1.1
Feedlots Voerkraal	2500 m ³ /a	Zero	Zero	2500 m ³ /a	Total 4.1.2.1 Totaal 4.1.2.1
Domestic water use Huishoudelike watergebruik	1500 m ³ /a	Zero	Zero	1500 m ³ /a	Total 4.1.2.2 Totaal 4.1.2.2
Industrial water use Gebruik vir nywerhede	Zero	Zero	Zero	Zero	Total 4.1.2.3 Totaal 4.1.2.3



* Mark the position of any boreholes on map

* Dui aan die posisie van enige boorgate op kaart

Summary Opsamming

Total Scheduled Irrigation Board (from LBO list)
Totaal Besproeiingsraadtoekenning (van LBO lys af)

Zero m³

Total Irrigation Board volume used
Totaal Besproeiingsraadtoekenning eintlik gebruik

Zero m³

Total other sources volume used
Totaal ander waterbronne gebruik

283 011 m³/a →

Total volume used
Totaal volume gebruik

283 011 m³/a →

4.2

Storage

Opgaring

Map reference number Veld nommer op kaart	Area (ha) Oppervlakte (ha)	Method for determining volume Metode vir volume bepaling	Maximum wall height (m) Maksimum walhoogte (m)	Average water depth at full supply level (m) Gemiddelde water diepte volvoorraadvlak (m ³)	Crest length of wall (m) Kruin lengte van muur (m)	Volume (m ³) Volume (m ³)
--	-------------------------------	--	---	--	---	--

Total
Totaal

There are no storage dams on the property

4.3

Stream Flow Reduction Activity



Stream flow reduction activities refer to commercial forestry plantations.

Stroomvloeivermindering Aktiviteit

Stroomvloeiverminderingsaktiwiteite verwys na kommersiële bosbouplantasies.

Field number on map Veld nommer op kaart	Type of trees in plantation Tipe bome in plantasie	Plantation area (ha) Plantasie oppervlakte (ha)	Water use rate (m ³ /ha/year) Watergebruik per eenheid (m ³ /ha/jaar)	Volume (m ³) Volume (m ³)
F9	PINE	12.54	2500	31350 m ³ /a
F10	PINE	2.37	2500	5925 m ³ /a
Total Totaal		14.91		37275 m ³ /a

5

ELU Summary

BWW Opsomming



This is a preliminary summary of the water user's ELU.

Dit is 'n voorlopige opsomming van die watergebruiker se BWW.

Type of water use Watergebruik tipe	Volume (m ³ /annum) Volume (m ³ /annum)	Source Bron	Irrigation Board or Water User Association Besproeiingsraad of Watergebruikersvereniging
--	--	----------------	---

Irrigation + Domestic + Stock-watering 283011 m³/a Surface Water - Moudensbeek River n/a

+ Stream Flow Reduction Use = 37275 m³/a

6

Application for verification

Aansoek van Verifikasie

I,

(Initials and surname)

hereby apply for the verification of my Existing Lawful Water use in terms of Section 35 of the National Water Act (Act 36 of 1998). Furthermore, I approve that the Information in the preceding tables, including the amendments thereto, as accepted by DWS, be applied to my Water Use registration. If an authorised representative signs the application for verification, Power of Attorney from the water user must be attached. Refer to Power of Attorney template in the Guideline document.

Hiermee verklaar ek, RAYMOND JOHN GIBSON

(Voorletters en van)

dat ek aansoek doen vir die verifikasie van my Bestaande Wettige Watergebruik in terme van Artikel 35 van die Nasionale Waterwet (Wet 36 van 1998). Ek keur dit goed dat die inligting in die voorafgaande tabelle, en wysigings daarvan, soos deur DWS goedgekeur word, aangewend word om my Watergebruik registrasie(s) op te dateer. Indien 'n gemagtigde verteenwoordiger die aansoek vir verifikasie teken moet Volmag van die watergebruiker af aangeheg word. Verwys na Volmag sjabloon in die Riglyndokument.

Position / Hoedanigheid: DIREKTEUR

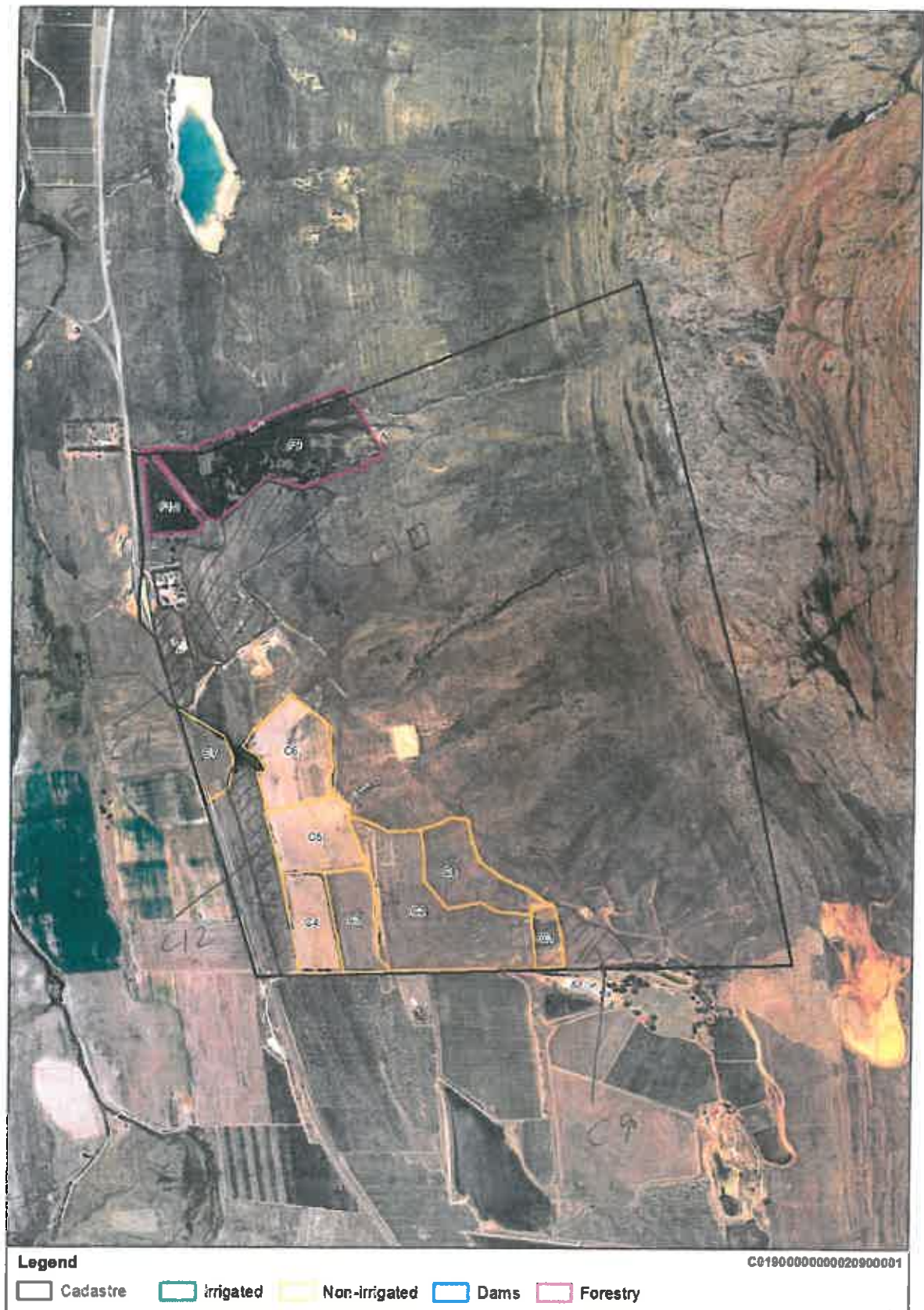
Signature / Handtekening:



Date / Datum:

16 May 2017

AURECON 2000 LAND USE COLOUR IMAGE



OUR 2000 LAND USE COLOUR IMAGE

Date: 2000

2000 Land Use Colour Image

Scale: 1: 12 000

Portion 1 of the farm Kleinvlei 209

Legend

- Farm Portion
- Pine

Fields_2000

<all other values>

Crop_Type

- Fruit
- Vegetables - Summer

3319AB07.ecw

RGB

- Red Band_1
- Green Band_2
- Blue Band_3

3319AB08.ecw

RGB

- Red Band_1
- Green Band_2
- Blue Band_3

PORTION 1 OF KLEINVLEI 209
CERES RD
RTS BOEDERY (PTY) LTD

The first part of the paper discusses the importance of understanding the cultural context of the research. It highlights the need for researchers to be sensitive to the values and beliefs of the communities they are studying. This is particularly important in the field of education, where cultural differences can significantly impact learning outcomes.

The second part of the paper focuses on the methodology used in the study. It describes the process of selecting participants, collecting data, and analyzing the results. The authors emphasize the importance of using a mixed-methods approach to gain a comprehensive understanding of the research topic.

The third part of the paper presents the findings of the study. It discusses the results of the quantitative data analysis and the insights gained from the qualitative interviews. The authors conclude that there are significant differences in learning outcomes between the two groups, and these differences can be attributed to cultural factors.

The final part of the paper offers recommendations for future research and practice. It suggests that educators should be aware of the cultural context of their students and tailor their teaching methods accordingly. Additionally, it calls for further research to explore the underlying reasons for the observed differences.



DAM SAFETY OFFICE

PRIVATE BAG X313 PRETORIA 0001

APPLICATION FOR CLASSIFICATION OF A PROPOSED NEW DAM OR ENLARGEMENT OR ALTERATION OF AN EXISTING DAM

Only applicable if the maximum wall height of the dam exceeds 5 metres and the gross storage capacity is more than 50 000 cubic metres

1. PARTICULARS OF THE DAM OWNER

1.1. Name of dam owner	HOWBILL FARMING (PTY) LTD															
1.2. Owner's postal address	PO BOX 146 CERES															
	Postal code 6 8 3 5															
1.3. Tel. no. of dam owner	0 2 3 3 1 7 0 8 2 3															
1.4. E-mail address of person in control of the dam	tian@howbill.co.za															
1.5 Name and postal address of person in control of the dam (if applicable)	TIAN ERASMUS PO BOX 146 CERES															
	Postal code 6 8 3 5															
1.6. Tel. no. of person in control of the dam	0 7 4 1 7 0 3 5 4 2															
1.7. E-mail address of person in control of the dam	tian@howbill.co.za															


2. PROPERTY ON WHICH THE DAM IS OR WILL BE SITUATED AND LOCALITY

2.1. Property description as per title deed	FARM 209 PORTION 1 KLEINVLEI															
2.2. Magisterial district	CERES RD															
2.3. Nearest city/town	DORP-OP-DIE-BERG															
2.4. Distance to nearest city or town	6 km															
2.5. Direction from nearest city or town	NORTH															
2.6. Number of 1:50 000 scale topographical map	* 3 3 1 9 A D															
* A copy of the relevant portion of this map which clearly indicates the position of the dam and downstream area must be attached																
2.7. Position of the centre of the dam wall to an accuracy of one second	Latitude: 3 3° 0 4' 0 2" Longitude: 1 9° 1 9' 5 7"															
2.8. Title deed number	T 30024/ 1985															

Page 3 of 4

[illegible]

I declare that the information given by me for the classification of the above dam is true and correct.

Signature: 

Date: 20/11/2019

NB! Remember to attach a clear copy of the relevant topographical map (see 2.6)

PRELIMINARY EVALUATION OF THE PROPOSED EARTH DAM: QUANTITIES AND COSTING

Client: Howbill Farming
Address: P.O. Box 146
 Ceres 6835

Dam: KLEINVLEI DAM

Notes: 1. VAT EXCL.
 2. Report 1 -Opt. 2 (Single wall)
 3. Capacity ±235 000m³

Project Nr.: 1921
Annexure: A
Date: 12-Dec-19
Prepared: Stanley

Version: May 2019
Report by: Charl Bester
 SAREL BESTER ENGINEERS
 P.O. Box 21, Ceres 6835
 Ph: 023-312 2017
 Fax: 086-514 3350

Design Parameters & Assumptions:

Crest width (m): 4.0 *Cut-off depth (m):* 3.00
Upstream slope 1: 3.0 *Cut-off base (m):* 4.00
Downstream Slope 1: 2.0 *Cut-off slope 1:* 0.75
Percentage of fill from dam basin: 50% *Application (m³/ha):* 7,000

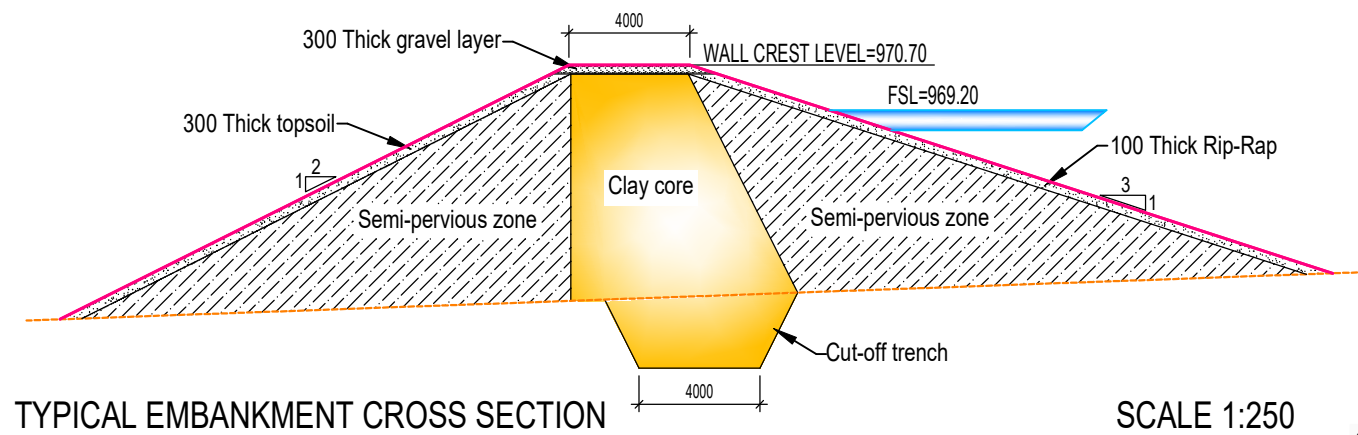
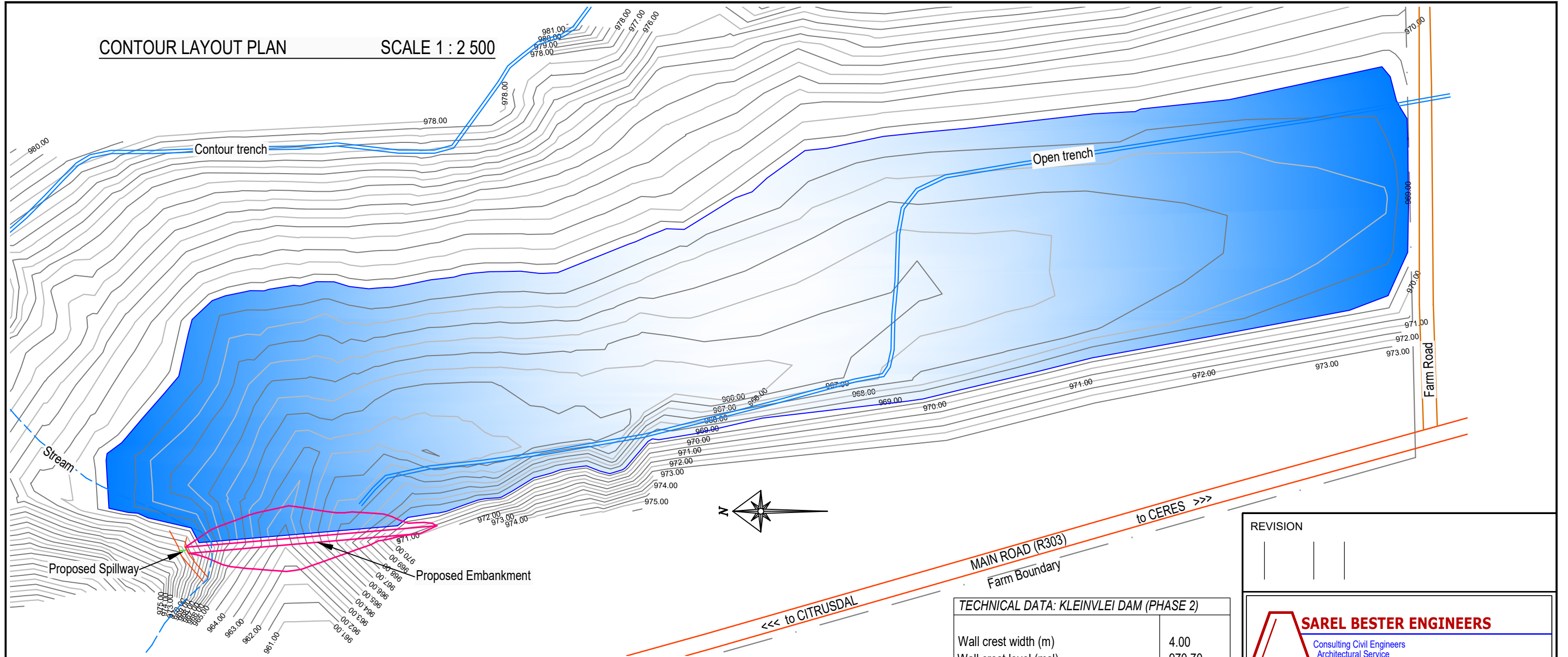
Financial Assumptions:

Earthmoving Cost (R/m³): 45.00
Basic Fees Scale (%): 12.0%
Fees Base Value (R): R 11,500,000
Enlargement (Y/N): N

Item	Description	Unit	Stadium / Wall position / Terrain				
			Stadium 1 <i>Existing</i>	Stadium 2 <i>Rep 1 – Opt2</i>	Stadium 3	Stadium 4	Stadium 5
1 EMBANKMENT							
1.1	Wall crest level	masl		970.70			
1.2	Lowest ground level below wall	masl		962.30			
1.3	Maximum wall height	m	#N/A	8.40	#N/A	#N/A	#N/A
1.4	Wall crest length	m		154.3			
1.5	Wall volume - excluding cut-off	m³		10,400			
1.6	Cut-off trench excavation	m³	#N/A	2,893	#N/A	#N/A	#N/A
1.7	Total earthmoving	m³	#N/A	13,293	#N/A	#N/A	#N/A
2 STORAGE CAPACITY							
2.1	Full supply level	masl		969.20			
2.2	Draw-off level	masl		964.00			
2.3	Total free-board	m	0.00	1.50	0.00	0.00	0.00
2.4	Maximum depth above draw-off level	m	0.00	5.20	0.00	0.00	0.00
2.5	Nett capacity from contours	m³		230,000			
2.6	Capacity gain from excavations	m³	0	5,200	0	0	0
2.7	Potential gross capacity	m³	0	235,200	0	0	0
2.8	Water surface	ha		12.00			
2.9	Potential irrigation	ha	0.00	33.60	0.00	0.00	0.00
2.10	Average water depth	m	#DIV/0!	1.96	#DIV/0!	#DIV/0!	#DIV/0!
2.11	Ratio Storage : Earthworks		#N/A	17.69	#N/A	#N/A	#N/A
2.12	Recommended pipe diameter	mm	150	250	150	150	150
3 COSTING (Excl VAT)							
3.1	Overhead & Preparation	Rand	#N/A	92,029	#N/A	#N/A	#N/A
3.2	Earthworks (excavate & construct)	Rand	#N/A	598,191	#N/A	#N/A	#N/A
3.3	Concrete & Outlet works	Rand	#N/A	178,214	#N/A	#N/A	#N/A
3.4	Diverse & Unforeseen	Rand	#N/A	92,029	#N/A	#N/A	#N/A
3.5		Rand					
3.6	Estimated Construction Cost	Rand	#N/A	960,463	#N/A	#N/A	#N/A
3.7	Engineering Fees Percentage	%	#N/A	15.7%	#N/A	#N/A	#N/A
3.8	Engineers costs (ECSA Fees)	Rand	#N/A	151,018	#N/A	#N/A	#N/A
3.9	Engineers costs (Disbursements)	Rand					
3.10	Estimated Engineers Costs	Rand	#N/A	151,018	#N/A	#N/A	#N/A
3.11		Rand					
3.12		Rand					
3.13	Total estimated capital cost	Rand	#N/A	1,111,481	#N/A	#N/A	#N/A
3.14	Capital costs per m³ gross capacity	Rand	#N/A	4.73	#N/A	#N/A	#N/A
3.15	Capital costs per irrigated hectare	Rand	#N/A	33,080	#N/A	#N/A	#N/A

CONTOUR LAYOUT PLAN

SCALE 1 : 2 500

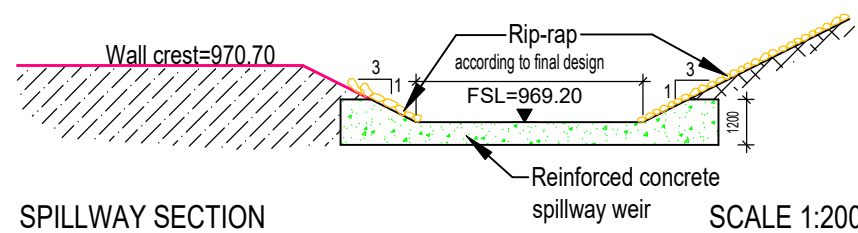
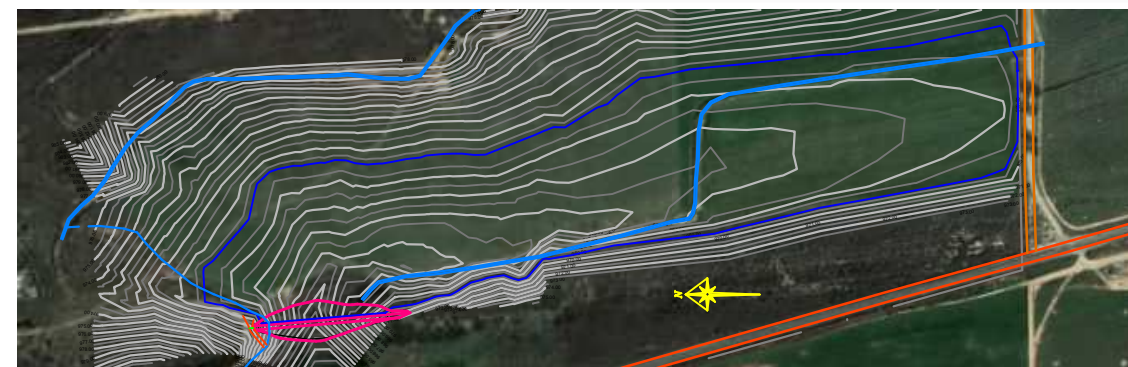


TYPICAL EMBANKMENT CROSS SECTION

SCALE 1:250

CONTOUR LAYOUT PLAN (AERIAL PHOTO)

SCALE 1 : 7 500



SPILLWAY SECTION

SCALE 1:200

TECHNICAL DATA: KLEINVLEI DAM (PHASE 2)

Wall crest width (m)	4.00
Wall crest level (msl)	970.70
Lowest groundlevel D/S (msl)	962.30
Maximum wall height (m)	8.40
Wall crest length (m)	154.30
Upstream slope	1: 3.00
Downstream slope	1: 2.00
Earthfill -cut-off trench excluded (m³)	10 400
Total earthfill (m³)	13 300
Full supply level (msl)	969.20
Total freeboard (m)	1.50
Netto storage capacity (m³)	±235 000
Flooded area (ha)	±12.00
Dam footprint area (ha)	±13.00
Spillway crest length (m)	--

REVISION

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SAREL BESTER ENGINEERS
Consulting Civil Engineers
Architectural Service

..... Date: 12/12/2019
MC BESTER
Pr. Eng., B.Eng., MSAICE:970598, SACAP:T1218
P.O. Box 21
62 Lyell Street
CERES, 6835
Ph: 023-312 2017
Fax: 023-312 3802
e-mail: admin@sbri.co.za

Howbill Farming (Pty) Ltd
P.O. Box 146
CERES
6835

PROPOSED KLEINVLEI DAM ON THE FARM
DE HOEK, KOUEBOKKEVELD, CERES

Proposed Contour Layout Plan, Aerial Photo,
Embankment & Spillway Cross Sections

DRAWN	DATE	SCALE	SHEET
R van der Merwe SC Hartzenberg	DEC. 2019	as shown	1 of 1
SURVEYED	DESIGNED	DWG. NUMBER	REV.
R van der Merwe SC Hartzenberg	Sarel Bester Engineers	1921-S2-01	

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A3