THE PROPOSED DASBERG BOERDERY: CONSTRUCTION OF A NEW DAM

ON PORTION 5 OF

FARM VAN DER WATTSKLRAAL NO.399, SWELLENDAM, WESTERN CAPE

Environmental Impact Report (EIR) for comment

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VOLUME 1

DASBERG BOERDERY

PROPOSED DASBERG BOERDERY: CONSTRUCTIONOF A NEW DAM

On Portion 5 of Farm van der Wattskraal No.399, Swellendam, Western Cape

DEA&DP Ref No.: 16/3/3/6/7/E3/10/1278/16

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ACRONYMS

BGIS	Biodiversity Geographic Information System
CBA	Critical Biodiversity Area
DEA	Department of Environmental Affairs
DEA&DP	Department of Environmental Affairs and Development Planning
DWA	Department of Water Affairs
EAP	Environmental Assessment Practitioner
ECA	Environment Conservation Act (Act No. 73 of 1989)
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMP	Environmental Management Programme
HIA	Heritage Impact Assessment
HWC	Heritage Western Cape
I&APs	Interested and Affected Parties
NEMA	National Environmental Management Act (Act No. 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
NHRA	National Heritage Resources Act (Act No. 25 of 1999)
NID	Notice of Intent to Develop
NWA	National Water Act
OESA	Other Ecological Support Area
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
WULA	Water Use Licence Application

1. INTRODUCTION

1.1 BACKGROUND

Agriculture is the main economic driver of the Overberg and mainly responsible for the socio-economic stability of the area. SW Viljoen Boerdery started from very small beginnings, owning very little of his own land. However, good management and business decisions turned it into one of the most successful farming units in the Overberg, planting approximately 2 300 ha of grain together with up to 8 000 sheep breeding stock and winning numerous awards for good farming practices. In order to stay successful farmers are increasingly under pressure to perform better and to minimise risks. The owner believes that farming is not a right, but a privilege and has been looking for opportunities to establish a successful BEE partnership, which will also enable land reform within the agricultural sector and will benefit loyal workers in his business. The main criteria being that any such project must be viable over the long term and must lead to positive agricultural contributions.

In order to minimise risks the owner is proposing to diversify its agricultural produce by establishing a citrus branch on one of its properties. This is also seen as the perfect project for realising land reform and BEE partnership. Various models were evaluated, and it was decided to base this partnership on the PALS (Partnerships in Agri Land Solutions) model, which have been successfully implemented by the Witzenberg PALS project (Department of Rural Development and Land Reform). In order to establish the 105 ha of citrus orchards, irrigation will be required. Water will be obtained from Eksteenkloof, but a storage dam must be established.

Thus, consideration is being given to the construction of a farm storage dam on Portion 5 of Farm van der Wattskraal No. 399, about 15,5 km east of Riviersonderend and 45,7 km west of Swellendam. The proposed dam wall will be 19,5 m high and will have a capacity of approximately 625 000 cubic meters. The area to be inundated will be approximately 8,8 ha.

The applicant is Dasberg Boerdery (PTY) Ltd who will undertake the activity should it be approved. EnviroAfrica CC has been appointed as the independent environmental assessment practitioner (EAP) responsible for undertaking the relevant EIA and the Public Participation Process required in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA).

1.2 DESCRIPTION OF THE PROPOSED ACTIVITY

It is proposed that a farm storage dam be constructed on Portion 5 of Farm van der Wattskraal No. 399. Water will be used for the irrigation of proposed 105ha of citrus orchards.

The dam will be located on existing agricultural land (wheat farming) within the undulating Rûens veld and on the same property where the 100ha of the 105 ha citrus orchards will be established. The location was chosen to ensure the project life cycle costs are minimised (gravity feed vs. pumping cost etc.) as no pump station will be required and water will flow with gravity from the water source to the dam.

The citrus orchards will be developed on agricultural land previously used for wheat farming. It should be noted that existing historical crop lands will be used for the cultivation of citrus orchards and that the current footprint will not be enlarged. It is thus not virgin/ natural soil that will be disturbed, but previously cultivated/ previously ploughed land. Please refer to Appendix 2.1 for layout plans for the proposed dam and for the cultivation of the orchards.

Figure 1 of **Appendix 2.1** provides a layout plan for the proposed Dasberg dam as well as the proposed layout for the pipeline extension and shows Portion 5 of van der Wattskraal 399 (5/399) and Remainder of farm van der Wattskraal 399 (RE/399). **Figure 3 Appendix 2.1** provides a layout plan of the planned 105ha orchard cultivation in relation to the proposed dam. It is proposed that 5ha of orchards will be developed on Remaining extent of van der Wattskraal 399 (RE/399), west of the N2. 100 ha of orchards will be developed on Portion 5 of farm van der Wattskraal 399 (5/399), the same property on which Dasberg dam is proposed.

The proposed dam will have a maximum dam wall height of 19,5 m, a dam wall length of approximately 550 m, and will have a capacity of approximately 625 000 cubic meters. The water surface at full capacity will be approximately 8,8 ha. Please refer to **Appendix 2.1** for the layout plan of the proposed Dasberg Dam and **Appendix 9** for the Preliminary Design Report for the proposed dam which includes design drawings of the dam and associated infrastructure.

A new pipeline, approximately 1.5 km in length and a diameter of about 250 mm will be constructed from the dam to the N2, where it will connect with an existing pipeline. Please refer to **Figure 5 & 6 Appendix 2.1** for the layout plan of the proposed pipeline route. The route has been chosen to avoid the stream/ wetland habitat to the west of the property (Portion 5 of Farm van der Wattskraal No. 399) and will extend through cultivated land (please refer to **Appendix 2.2 Figure 3** for the sensitivity map). It is proposed the pipeline will cross the N2 within an existing sheep culvert and connect to the existing pipeline on Remainder of the Farm Wattskraal No. 399. The pipeline will be constructed on previously disturbed land and will thus not trigger

any listed activities in terms of NEMA 2014, as amended. The total footprint of the dam with associated infrastructure is expected to be approximately 9.55 ha.

Access to the dam will be from existing farm roads, with access to the farm from the N2. Please see **Appendix 1** for locality maps.

For the proposed BEE project of 105ha citrus orchards. Water will be obtained from Eksteenkloof within existing water extraction rights (240 000 m³). An additional 120 000m³ abstraction from Eksteenskloof will be needed to be combined with the existing 240 000m³ (to be transferred to Wanderwatts kraal399/5). An additional 232 000m³ will be bought and transferred to the Dasberg Dam for storage, as well as an additional 60 000m³ of summer listing waster which does not have to be stored. This will give a total of 652 000m³ water that can be stored in the proposed dam. A WULA process, was submitted in Apr 2017 of which the reference number is **Ref 4/5/1/H10J/Dasberg 399/5**. Please also refer to **Appendix 5.2.3.2 & 5.2.3.7.**

With further investigation based on the Departments queries, the EAP would like to clarify that the Scope and description of the proposed project does not involve the upgrade of a weir, which the EAP erroneously mentioned in the Scoping Report. The weir does not form part of the scope and will be used as is.

Figure 1: Aerial image showing site location, with a green polygon, in proximity to surrounding towns and roads

2. NEED AND DESIRABILITY

In terms of the National Environmental Management Act, and EIA 2014 regulations, as amended, the Scoping/EIA report must provide a description of the need and desirability of the proposed activity. The consideration of "need and desirability" in EIA decision-making requires the consideration of the strategic context of the development proposal along with the broader societal needs and the public interest.

While the concept of need and desirability relates to the *type* of development being proposed, essentially, the concept of need and desirability can be explained in terms of the general meaning of its two components in which *need* refers to *time* and *desirability* to *place* – i.e. is this the right time and is it the right place for locating the type of land-use/activity being proposed? Need and desirability can be equated to *wise use of land* – i.e. the question of what is the most sustainable use of land.

2.1 NEED

The Dasberg Boerdery business proposal (**Appendix 3**) motivates the need of the proposed dam as follows:

> *Agriculture is the main economic driver of the Overberg and is also mainly responsible for the socio-economic stability of the area. SW Viljoen Boerdery started from very small beginnings, owning very little of his own land. However, good management and business decisions turned it into one of the most successful farming units in the Overberg, planting approximately 2 300 ha of grain together with up to 8 000 sheep breeding stock and winning numerous awards for good farming practices. The owner believes that farming is a privilege, not a right and is looking for opportunities to establish a successful Black Economic Empowerment (BEE) partnership, which will enable land reform within the agricultural sector and will benefit loyal workers in his business.*
>
> *In order to minimise risks the owner is proposing to diversify its agricultural produce by establishing a citrus branch on one of its properties. This is also seen as the perfect project for realising land reform and BEE partnership. Various models were evaluated, and it was decided to base this partnership on the PALS (Partnerships in Agri Land Solutions) model, which have been successfully implemented by the Witzenberg PALS project (Department of Rural Development and Land Reform). The establishment of the citrus branch will create the opportunity to increase staff on the farm. According to the business plan, there are currently 13 families who will directly benefit from the expansion of the citrus orchards, of which 3 are female workers and the main breadwinners for their families.*

In order to establish the citrus orchards, irrigation will be required. It is therefore of critical importance to the success and feasibility of this business proposal, which is expected to create a number of jobs in the area, that there be sufficient supply and storage of irrigation water for the proposed expansion of the production of citrus.

2.2 DESIRABILITY

The following factors determine the desirability of the area for the proposed Dasberg dam.

2.2.1 Location and Accessibility

The proposed location of the dam site is considered ideally suited for the construction of the dam.

From an engineering point of view, the location was chosen to ensure the project life cycle costs are minimised (gravity feed vs. pumping cost etc.). The proposed site location is preferred due to the favourable soil and foundation conditions. The site is also in close proximity to the source of water and the citrus orchards will be developed on the same property as the proposed dam.

Access to the farm will be from the N1, the site can be accessed via existing farm roads, no additional roads will need to be constructed.

Location maps are included in **Appendix 1** with site photographs in **Appendix 4.**

2.2.2 Compatibility with the Surrounding Area

The site is largely surrounded by agricultural activities, in particular crop cultivation (wheat farming). This is evident in the aerial image, Figure 1 above and site photographs in **Appendix 4**.

The proposed activity will therefore not be “out of character” with the surrounding land use and is expected to have a negligible impact on the visual character of the area.

3. LEGAL REQUIREMENTS

The current assessment is being undertaken in terms of the National Environmental Management Act (Act 107 of 1998, NEMA), to be read with section 24 (5): NEMA EIA Regulations 2010. However, the provisions of various other Acts must also be considered within this EIA.

The legislation that is relevant to this study is briefly outlined below.

3.1 THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA

The Constitution of the Republic of South Africa (Act 108 of 1996) states that everyone has a right to a non-threatening environment and that reasonable measures are applied to protect the environment. This includes preventing pollution and promoting conservation and environmentally sustainable development, while promoting justifiable social and economic development.

3.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998)

The National Environmental Management Act (Act 107 of 1998) (NEMA), as amended, makes provision for the identification and assessment of activities that are potentially detrimental to the environment and which require authorisation from the relevant authorities based on the findings of an environmental assessment. NEMA is a national act, which is enforced by the Department of Environmental Affairs (DEA). These powers are delegated in the Western Cape to the Department of Environmental Affairs and Development Planning (DEA&DP).

On the 4 December 2014 the Minister of Environmental Affairs promulgated regulations in terms of environmental impact assessments, under sections 24(5) and 44 of NEMA, namely the EIA Regulations 2014 (GN No. R 326) these regulations were amended in April 2017, and include:

- GN No. R. 327 (Listing Notice 1);
- GN No. R. 325 (Listing Notice 2); and
- GN No. R. 324 (Listing Notice 3).

Listing Notice 1 and 3 are for a Basic Assessment and Listing Notice 2 for a full Environmental Impact Assessment.

According to the 2014 EIA regulations, as amended in 2017, the following potentially listed activities may be triggered (refer to Table 1)

Table 1: Summary of 2014 EIA regulations triggered

GN R327	Short description of relevant Activity(ies) in terms of Listing Notice 1	Description of specific portion of the development that might trigger the listed activity.
12	The development of (iv) dams, where the dam, including infrastructure and water surface area, exceeds 100 m^2 in size (a) within a watercourse	Development of infrastructure with surface measurement of approximately 8.8 ha is expected to be in the upper reaches of a small stream.
19	Moving more than 10 m^3 of material from a water course.	Development of infrastructure with surface measurement of approx. 8.8 ha is expected to be in the upper reaches of a small stream.
27	The clearance of an area of 1 ha or more, but less than 20 ha of indigenous vegetation	
GN R325	**Short description of relevant Activity(ies) in terms of Listing Notice 2**	**Description of specific portion of the development that might trigger the listed activity.**
16	Development of a dam, with s dam wall higher than 5m, or where the high-water mark if the dam will be increased with 10 ha.	The proposed dam wall is 19.5 m
GN R324	**Short description of relevant Activity(ies) in terms of Listing Notice 3**	**Description of specific portion of the development that might trigger the listed activity.**
12	Clearance of more than 300 m^2 of indigenous vegetation within critical biodiversity areas	The proposed activity will enable the clearance of approximately 8.8 ha of vegetation within a critical biodiversity area
14	The development of (iv) dams, where the dam, including infrastructure and water surface area exceeds 10m^2 in size	Development of infrastructure with surface measurement of approx. 8.8 ha is expected to be within a critical biodiversity area

The principles of environmental management as set out in section 2 of NEMA have been taken into account. The principles pertinent to this activity include:

- People and their needs will be placed at the forefront while serving their physical, psychological, developmental, cultural and social interests. The activity seeks to provide additional employment and economic development opportunities, which are a local and national need – *the proposed activity is expected to have a beneficial impact on people, especially developmental and social benefits, as well providing additional employment and economic development opportunities.*
- Development will be socially, environmentally and economically sustainable. Where disturbance of ecosystems, loss of biodiversity, pollution and degradation, and landscapes and sites that constitute the nation's cultural heritage cannot be avoided, are minimised and remedied. The impact that the activity will potentially have on these will be considered, and mitigation measures will be put in place - *potential impacts have been identified and considered, and any further potential impacts will be identified during the public participation process. Mitigation measures will be included in the EMP*.
- Where waste cannot be avoided, it will be minimised and remedied through the implementation and adherence of the Environmental Management Programme (EMP) – *this will be included in the EIR*.
- The use of non-renewable natural resources will be responsible and equitable.
- The negative impacts on the environment and on people's environmental rights will be anticipated, investigated and prevented, and where they cannot be prevented, will be minimised and remedied.

- The interests, needs and values of all interested and affected parties will be taken into account in any decisions through the Public Participation Process.
- The social, economic and environmental impacts of the activity will be considered, assessed and evaluated, including the disadvantages and benefits.
- The effects of decisions on all aspects of the environment and all people in the environment will be taken into account, by pursuing what is considered the best practicable environmental option.

3.3 NATIONAL HERITAGE RESOURCES ACT

The protection and management of South Africa's heritage resources are controlled by the National Heritage Resources Act (Act No. 25 of 1999). South African National Heritage Resources Agency (SAHRA) is the enforcing authority and in the Western Cape, SAHRA have, in most cases, delegated this authority to Heritage Western Cape (HWC).

In terms of Section 38 of the National Heritage Resources Act, SAHRA and/or HWC will require a Heritage Impact Assessment (HIA) where certain categories of development are proposed. Section 38(8) also makes provision for the assessment of heritage impacts as part of an EIA process and indicates that if such an assessment is found to be adequate, a separate HIA is not required.

The National Heritage Resources Act requires relevant authorities to be notified regarding this proposed development, as the following activities are relevant:

- *any development or other activity which will change the character of a site exceeding 5 000 m² in extent;*

Furthermore, in terms of Section 34(1), no person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit issued by the SAHRA, or the responsible resources authority. Nor may anyone destroy, damage, alter, exhume or remove from its original position, or otherwise disturb, any grave or burial ground older than 60 years, which is situated outside a formal cemetery administered by a local authority, without a permit issued by the SAHRA, or a provincial heritage authority, in terms of Section 36 (3). In terms of Section 35 (4), no person may destroy, damage, excavate, alter or remove from its original position, or collect, any archaeological material or object, without a permit issued by the SAHRA, or the responsible resources authority.

3.4 EIA GUIDELINE AND INFORMATION DOCUMENT SERIES

The following are the latest guidelines that form part of the DEA&DP's *Environmental Impact Assessment Guideline and Information Document Series (Dated: October 2011)*:

- ✓ *Guideline on Transitional Arrangements*
- ✓ *Guideline on Alternatives*
- ✓ *Guideline on Public Participation*
- ✓ *Guideline on Exemption Applications*
- ✓ *Guideline on Appeals*

- ✓ *Guideline on Need and Desirability*
- ✓ *Information Document on the Interpretation of the Listed Activities*
- ✓ *Information Document on Generic Terms of Reference for EAPs and Project Schedules*

3.5 NATIONAL WATER ACT

Besides the provisions of NEMA for this EIA process, the proposed dam also requires authorizations under the National Water Act (Act N0. 36 of 1998). The Department of Water Affairs, who administer that Act, will be a leading role-player in the EIA.

Existing water extraction rights of 40 ha (240 000 m^3) from the Eksteenskloof will be used. Additional water rights might have to be obtained for which a WULA application process will be launched.

In terms of Chapter 12 of the National Water Act, the proposed dam is considered a dam with a safety risk. The dam therefore requires a permit to construct from the Dam Safety Office of the Department of Water Affairs. The design and construction must conform to the conditions of the Dam Safety Regulations as set out in Government Notice R139 in Government Gazette No. 35062 of 24 February 2012. Regulations 10 and 15 will be applicable to the proposed dam. A licence to construct application will only be submitted after an application for the safety classification of the proposed dam has been submitted, and only after the NEMA process has been concluded.

3.6 NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT

The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) is part of a suite of legislation falling under NEMA, which includes the Protected Areas Act, the Air Quality Act, the Integrated Coastal Management Act and the Waste Act. Chapter 4 of NEMBA deals with threatened and protected ecosystems and species and related threatened processes and restricted activities. The need to protect listed ecosystems is addressed (*Section 54*).

4. ALTERNATIVES

Alternatives have been considered during the Scoping phase and these are described below.

4.1 SITE ALTERNATIVES FOR THE PROPOSED DAM

Two site locations for the proposed dam have been considered and investigated. Three locations on the farms were identified as possible locations, and referred to as:

- Alternative A (preferred site alternative)
- Alternative B

These are indicated in Figure 2 below:

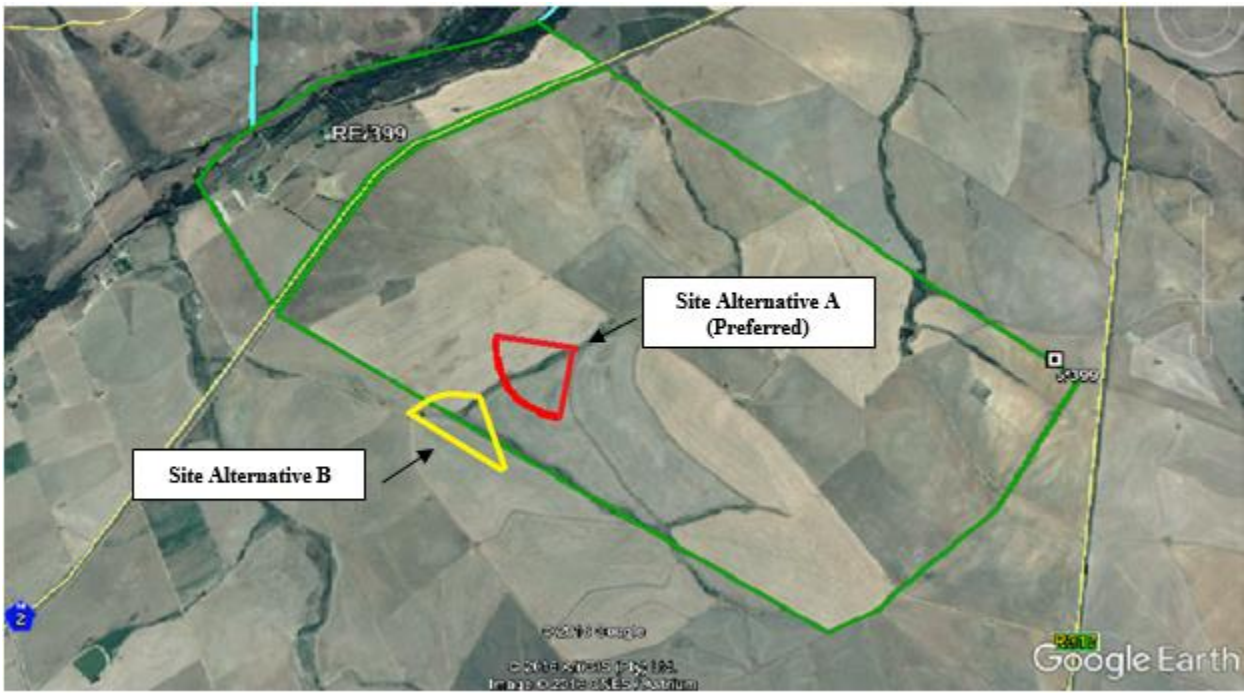

Figure 2: Areal image indicating Site Alternatives for the construction of Dasberg Dam. Alternative A is the preferred site alternative and represented by the red polygon. The yellow polygon represents site alternative B.

4.1.1 ALTERNATIVE B (NOT PREFERRED)

Alternative B, indicated by a yellow polygon in Figure 2 was suggested by the engineers. This alternative was suggested as it would provide a more suitable catchment area and cause less earth movement. A portion of the dam would then fall on a neighbouring farm. The neighbour did not grant permission to build a portion of the dam on his land and therefore Alternative A was suggested. Alternative B would also have needed a pump station to be constructed, whereas with Alternative A, no pump station is needed as water would flow with gravity from the water source to the proposed dam. Alternative A (preferred alternative) is represented by the red polygon in Figure 2.

4.1.2 ALTERNATIVE A (PREFERRED)

Alternative A, indicated by the red polygon in Figure 2 is the preferred alternative because of gravitational flow of water. The location was chosen to ensure the project life cycle costs are minimised (gravity feed vs. pumping cost etc.) as no pump station will be required and water will flow with gravity from the water source to the dam. This will also reduce the development footprint on the environment. This site location is favoured as is will be in closer proximity to the new citrus orchards. No neighbouring farmers will be impacted or lose agricultural land by the proposed construction of Dasberg dam.

4.2 ACTIVITY ALTERNATIVES

The purpose of the proposed dam is to provide the farm with enough water for its future irrigation requirements. No activity alternatives were considered.

4.3 NO-GO ALTERNATIVE

This is the option of not developing the proposed dam. Although this might result in no potential negative environmental impacts, the direct and indirect socio-economic benefits of not constructing the storage dam will not be realised. As described in *Section 2.1*, it is of critical importance to the success and feasibility of the business proposal to branch out citrus orchards on farm, which is expected to create jobs in the area, that there be sufficient supply and storage of irrigation water.

5. SITE DESCRIPTION

5.1 LOCATION

The site is located on Portion 5 of Farm van der Wattskraal No. 399, about 15,5 km east of Riviersonderend and 45,7 km west of Swellendam in the Western Cape (See Figure 1 above). The dam will be located on existing agricultural land (wheat farming) within the undulating ruêns veld. The site coordinates for the dam wall are: S 34° 7'52.79", E20° 02'53.51".
The Surveyor General code for the property is: C073000000003990005

Access to the farm is from the N2, the site can be accessed via existing access roads on the property.

Please refer to Figure 3 below for the proposed dam location associated surrounding land use and **Appendix 1** for location maps.

Figure 3: Photo indicating proposed dam location and surrounding land use.

5.2 VEGETATION

The proposed dam location is on existing intensive agricultural land (wheat farming and grazing land).

The dam will also absorb the upper reaches of a small stream (and its buffer zone of approximately 40 m), which is likely to contain remaining elements of Central Ruêns Shale

Renosterveld. This vegetation type is considered as critically endangered vegetation (Refer to Figure 4 and 5 below and **Appendix 1**).

The small stream has been included as an Ecological Support Area (ESA) in the Overberg Critical Biodiversity Areas maps.

Figure 4: Location of the proposed dam in the landscape showing the Overberg CBA overlay

Figure 5: Vegetation associated with the stream on the proposed site

5.3 FRESHWATER

The dam will also absorb the upper reaches of a small stream (and its buffer zone of approximately 40 m), which is likely to contain remaining elements of Central Ruêns Shale Renosterveld (Critically endangered vegetation).

The small stream has been included as an Ecological Support Area (ESA) in the Overberg Critical Biodiversity Areas maps.

Existing water extraction rights of 40 ha (240 000 m3) from the Eksteenskloof will be used. Additional water rights might have to be obtained for which a WULA application process will be launched.

5.4 CLIMATE

The area normally receives about 307mm if rain per year and because it receives most of its rainfall during winter it has a Mediterranean climate. It receives the lowest rainfall (10 mm) in December and the highest (40mm) in August. The monthly distribution of average daily maximum temperatures shows that the average midday temperatures for Riviersonderend (the closest town) range from 16.7°C in July to 27.8°C in January. The region is the coldest during July when the temperature drops to 4.8°C on average during the night. (www.saexplorer.co.za).

5.5 SOCIO-ECONOMIC CONTEXT

According to the Swellendam Municipality IDP Review of 2017, socio-economic upliftment of previously disadvantaged communities remains one of the main challenges faced by the municipality.

Agriculture accounts for 13 % of the total employment of the municipalities working population. There has been a negative GDPR growth in for the Agricultural sector as well as a net job loss on the sector.

A 2014-15 farmworker survey show that the overall 62,63% of individuals living in farmworker households have permanent jobs both on and off the farms they live on, 18.1% are unemployed while 19.27% have either temporary or seasonal work. This means that 37% of those living on farms are at some point in the next 12 months at risk of not being employed.

The official unemployment rate of 12.5% is only half of that of the national employment rate and the lowest in the Overberg District. Employment opportunities have not increased, and there is a definite need for economic development, and subsequent employment opportunities.

5.6 HERITAGE FEATURES

The National Heritage Resources Act requires relevant authorities to be notified regarding this proposed development, as the following activities are relevant:

- *any development or other activity which will change the character of a site exceeding 5 000 m² in extent;*

A Heritage Impact Assessment (HIA) will have to be conducted as per the National Heritage Resources Act as the total footprint of the proposed dam and associated infrastructure is expected to be approximately 9.55 ha.

6. ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS

Environmental issues were raised through informal discussions with the project team, specialists and authorities, as well as by Interested and Affected Parties during the public participation period of the Scoping Report. All issues raised will be assessed in the specialist reports and will form part of the Environmental Impact Report. Any additional issues raised during the public participation will be listed in the Final Environmental Impact Report.

The following potential issues have been identified

6.1 BIODIVERSITY

6.1.1 Botanical

According to a vegetation map the proposed site is situated in endangered Central Rûens Shale Renosterveld, but due to the fact that the area is intensely cultivated, loss of this vegetation type is not expected to be significant. Loss of natural vegetation of the surrounding area and river corridors is expected to be low, as the site it is almost entirely surrounded by agricultural land.

However, there are still areas of natural vegetation that is expected to be inundated by the proposed dam. The dam is expected to absorb the upper reaches of a small stream (and its buffer zone of approximately 40 m), which is likely to contain remaining elements of Central Rûens Shale Renosterveld, which is considered to be critically endangered vegetation.

A botanical impact assessment was conducted to determine if there is any other sensitive or endangered vegetation on the proposed site. A specialist has been appointed and findings are discussed in Section 9.

Figure 6: Image indicating the type of vegetation (Central Ruen Shale Renosterveld) that would have been present at the proposed dam location. Due to the fact the area is agricultural land, only a small strip of the natural vegetation is still present around the stream.

6.2.2 Fauna

Because of the proximity to intensive cultivated areas it is not expected that the proposed dam location will have a significant impact on fauna species. Avi-fauna (water species) may even benefit from the dam. The impact on reptiles and amphibian will be much localised and may result in species being displaced (snakes and lizards) but not significant permanent impact on species is expected.

No further Faunal assessments are deemed necessary.

6.2 FRESHWATER

A fresh water impact assessment is proposed. This is due to the fact that the dam is expected to absorb the upper reaches of a small stream (and its buffer zone of approximately 40 m), which is likely to contain remaining elements of Central Ruêns Shale Renosterveld (which is considered to be critically endangered vegetation). The small stream has also been included as an Ecological Support Area (ESA) in the Overberg Critical Biodiversity Areas Map (Figure 3 above and Appendix 1). A fresh water specialist has been appointed, findings are discussed in Section 9 of the report.

6.3 HERITAGE

The possible impact on heritage resources has been identified as a possible environmental impact as a result of the construction of the dam. The dam with associated infrastructure is expected to have a footprint of approximately 9.55 ha. CTS Heritage conducted a Heritage Screener and submitted a NID to Heritage Western Cape (**Appendix 7.1.1 & 7.1.2**). Findings are discussed in Section 9 of the report.

6.4 VISUAL IMPACT

The potential impact on the sense of place of the proposed dam has also been considered. The surrounding area is characterised by agricultural activities, as well as a number of farm dams in the local area, and the proposed dam will therefore not be uncharacteristic for the area.

The sense of place is not expected to be altered by the proposed dam, and no further studies are suggested.

6.5 SAFETY

Due to the size of the dam and dam wall, the proposed dam is a safety risk in terms of Chapter 12 of the National Water Act and will require authorisation from the Department of Water Affairs. As mentioned in Section 3 above. A dam safety application was logged to the DWS. Please refer to comments from BGCMA **Appendix 5.2.3.7.**

6.6 LOSS OF AGRICULTURAL LAND

Due to the location of the proposed dam, part of the dam will inundate existing agricultural lands. The total footprint of the dam with associated infrastructure is expected to be approximately 9.55 ha. An area of approximately 9.55 ha of agricultural land will thus be lost in order to establish the dam.

6.7 SOCIO-ECONOMIC IMPACT

Although the construction of the proposed dam will create jobs during the construction phase of the activity, the dam will indirectly create additional jobs during the operational phase. As indicated in *Section 2.1*, the proposed dam is of critical importance to the success and feasibility of the business proposal to expand the citrus orchards, which is expected to create opportunity to increase staff on the farm.

The SW Viljoen workers trust owns initially 10 % of the share of Dasberg Boerdery (Pty) Ltd, but with approval of the business proposal, will be allowed to purchase shares up to a maximum of 20%. The workers trust beneficiaries are the permanent employees of the SW Viljoen farming group. The main goal of the trust is primarily uplifting. Typically, money will be used for medical and pension funds, scholarships for potential students as well as retirement housing funds.

There are currently 13 families that will benefit from the worker's trust. With the approval of the citrus branch there is potential to increase the workforce (Please refer to the Dasberg Business Proposal attached as **Appendix 3**).

6.8 OTHER ISSUES IDENTIFIED

Any further issues raised during the public participation process or by the Competent Authority not mentioned in this section, will be included in the Final EIR for decision.

7. DETAILS OF THE PUBLIC PARTICIPATION PROCESS

Interested and Affected Parties (I&APs) were identified throughout the process. Landowners adjacent to the proposed site, relevant organs of state, organizations, ward councillors and the Local and District Municipality were added to this database. A complete list of organisations and individual groups identified to date is shown in **Appendix 5.1.1 and 5.2.1.**

Public Participation was conducted for this proposed dam in accordance with the requirements outlined in Regulation 41, 42, 43 and 44 of the NEMA EIA Regulations 2014 as amended, as well as the Department of Environmental Affairs and Development Planning's guideline on Public Participation 2011. The issues and concerns raised during the scoping phase will be dealt with in the EIA phase of this application.

As such each subsection of Regulation 54 contained in Chapter 6 of the NEMA EIA Regulations will be addressed separately to thereby demonstrate that all potential Interested and Affected Parties (I&AP's) were notified of the proposed development.

Table 2: Public Participation Process

R41	**Posters, Advertisement & Notification letters**
(2) (a) (i)	Poster were displayed at the Overberg Agri in Riviersonderend, on the door of Continental Café at the corner of Main road and Van Riebeeck Ave, on the northern and southern boundary of the property as well as adjacent to the proposed dam location (Refer to **Appendix 5.1.4** for proof of posters) Posters were 60cm by 42 cm
(ii)	N/A No alternative site
(2) (b) (iii)	Notification letters were sent to the municipal ward councilor at the Swellendam Municipality (Refer to the stamp on the I&APs register **Appendix 5.1.1 & 5.1.3** for proof of notification letters sent)
(iv)	Notification letters were sent to Overberg District Municipality and Swellendam Local Municipality (Please refer to the stamp on the I&Aps register **Appendix 5.1.1 & 5.1.3**
(v)	Notification letters were sent to the following organs of state: o Department of Environment and Development Planning o Breede-Gourtiz Catchment Management Area o Cape Nature o Heritage Western Cape o Lower Breede River Conservancy Trust o WC Department of Agriculture and Land Use Management o Overberg Renosterveld Conservation Trust (Please refer to stamp on the I&Aps register **Appendix 5.1.1** for proof of notification letters sent**)**
(vi)	Notification letters were sent to neighbours (Please refer to **Appendix 5.1.1**)
(2) (c) (i)	An advert was placed in the Langberg Bulletin on 31 March 2017 (Please refer to **Appendix 5.1.2**)
R42 & 34	**Register of I&AP**
(a), (b), (c), (d)	A register of interested and affected parties was opened and maintained and is available to any person requesting access to the register in writing (Please refer to **Appendix 5.1.1 and 5.2.2** for the list of Interested and Affected Parties).
R43	**Registered I&AP entitled to comments**
3	

	I&AP were given 30 days for comments during the initial public participation phase. The Post-Application scoping report was made available to all registered I&APs for comment. For proof please refer to the second round of public participation as per **Appendix 5.2.2**
R44	**I&AP to be recorded**
	A summary of issues raised by I&AP are addressed in the comments and response report Refer to **Appendix 5.1.6 & 5.2.3** for comments and response report summary

8. SPECIALIST STUDIES

Specialist studies were undertaken to provide information to address the concerns and assess the impacts of the proposed development alternatives on the environment.

The specialists are provided with set criteria for undertaking their assessments, to allow for comparative assessment of all issues. These criteria are detailed in the Terms of Reference to each specialist and summarised below.

8.1 CRITERIA FOR SPECIALIST ASSESSMENT OF IMPACTS

The impacts of the proposed activity on the various components of the receiving environment will be evaluated in terms of duration (time scale), extent (spatial scale), magnitude and significance. These impacts could either be positive or negative.

The magnitude of an impact is a judgment value that rests with the individual assessor while the determination of significance rests on a combination of the criteria for duration, extent and magnitude. Significance thus is also a judgment value made by the individual assessor. Each specialist has their own methodology to determine significance.

8.2 BRIEFS FOR SPECIALIST STUDIES

8.2.1 Heritage Impact Assessment

Cedar Towers Services (CTS) Heritage conducted a Heritage Screener. Please find the report attached **Appendix 7.1**

The terms of reference for the archaeological study will be as follows:

- To determine whether there are likely to be any important archaeological sites or remains that might be impacted by the proposed development;
- To identify and map archaeological sites/remains that might be impacted by the proposed development;
- To assess the sensitivity and conservation significance of archaeological sites/remains in the inundation area;
- To assess the status and significance of any impacts resulting from the proposed development, and

8.2.2 Freshwater Impact Assessment

Natasha van Haar from EnviroSwift completed the Freshwater Impact Assessment. Please find the report attached as **Appendix 7.2.**

The terms of reference for the Freshwater assessment and River Rehabilitation Plan are as follows:

- Literature review and assessment of existing information
- Site Assessment of the proposed activities and impact on the associated freshwater systems This will include an assessment of the freshwater ecological condition, using river health indices such as in-stream and riparian habitat integrity, aquatic macro-invertebrates and riparian vegetation to determine set back lines and geomorphological condition of the streams, which will then determine the overall Ecostatus of the streams and provide data that will inform the Water Use Licence Application of the project. This will include both the stream to be impacted by the dam development and the pump station establishment.
- Describe ecological characteristics of freshwater systems and compile report based on the data and information collected in the previous two tasks, describe ecological characteristics of the freshwater systems, comment on the conservation value and importance of the freshwater systems and delineate the outer boundary of the riparian zones/riverine corridors.
- Evaluate the freshwater issues on the site and propose mitigation measures and measures for the rehabilitation of the site as well as setback lines for future development.
- Compilation of the documentation for submission of the water use authorisation application (WULA) to the Department of Water Affairs (if deemed necessary).

8.2.3 Biodiversity Impact Assessment

Dave Mc Donald completed the Biodiversity Impact Assessment. Please find the report attached as **Appendix 7.3**

The terms of reference for this study include the following:

- Describe the broad ecological characteristics of the site and its surrounds in terms of any mapped spatial components of ecological processes and/or patchiness, patch size, relative isolation of patches, connectivity, corridors, disturbance regimes, ecotones, buffering, viability, etc.
- In terms of biodiversity pattern, identify or describe:
  Community and ecosystem level:
  - The main vegetation type, its aerial extent and interaction with neighbouring types, soils or topography;
  - The types of plant communities that occur in the vicinity of the site

- Threatened or vulnerable ecosystems.

Species and ecosystems level:

- Red List species (give location if possible using GPS;
- The viability of an estimated population size of the Red List species that are present (include the degree of confidence in prediction based on availability of information and specialist knowledge, i.e. High=70-100% confident, Medium 40-70% confident, low 0-40% confident)
- The likelihood of other Red List species, or species of conservation concern, occurring in the vicinity (include degree of confidence).

Other pattern Issues:

- Any significant landscape features or rare or important vegetation associations such as seasonal wetlands, alluvium, seeps, quartz patches or salt marshes in the vicinity.
- The extent of alien plant cover of the site, and whether the infestation is the result of prior soil disturbance such as ploughing or quarrying (alien cover resulting from disturbance is generally more difficult to restore than infestation of undisturbed sites).
- The condition of the site in terms of current or previous land uses.

- In terms of the process, identify or describe:

- The key ecological “drivers” of ecosystems on the site and in the vicinity, such as fire.
- b. Any mapped spatial component of an ecological process that may occur at the site or in its vicinity (i.e. corridors such as watercourses, upland-lowland gradients, migration routes, coastal linkages or inland-trending dunes, and vegetation boundaries such as edaphic interfaces, upland-lowland interfaces or biome boundaries)
- c. Any possible changes in key processes, e.g. increased fire frequency or drainage/artificial recharge of aquatic systems.
- d. Would the conservation of the site lead to greater viability of the adjacent ecosystem by securing any of the functional factors listed in the first bullet?

- Would the site or neighbouring properties potentially contribute to meeting regional conservation targets for both biodiversity pattern and ecological processes?

9. ASSESSMENT OF ENVIRONMENTAL IMPACTS

The specialist studies detailed in Appendix 7 were undertaken to determine significance of the impact that may arise from the proposed development. The findings of the specialist studies are summarised here. Full copies of the studies are included in Appendix 7.

The following studies were undertaken:

9.1 Heritage Impact Assessment

A heritage screener was conducted by CTS Heritage (Please see **Appendix 7.1**). Key findings included:

9.1.2 Key findings

- There are no declared heritage sites within a 10km radius of the proposed development site.
- Archaeological material does occur in the region, but the location of this development on previously cultivated land makes any discovery if *in situ*, significant archaeological heritage resources unlikely.
- In terms of palaeontology, the proposed dam is located on underlying sandstone and Murdock deposits of the Early- to Mid-Devonian Voorstehoek Formation of the Ceres Subgroup. According to the SAHRIS Fossil Heritage Browser, these deposits are of high paleontological sensitivity, containing diverse shelly invertebrate.
- Bedrock exposure is very poor due to extensive superficial deposits.

9.1.3 Impact Assessment

- The proposed development of the dam will not have any negative significant impact on the Heritage resources of the area.
- Any excavations into bedrock in this region could result in impacts to the significant fossiliferous deposits and therefore it is suggested that a field assessment by a suitable palaeontologist must be conducted.

9.1.4 Mitigation Measures

Should any heritage resources, including graves and human burials, archaeological material and paleontological material be discovered during the development, all works must be stopped immediate and HWC must be notified without delay.

9.1.5 Conclusion

CTS Heritage conducted a Heritage Notice of Intend to Develop (NID) (**Appendix 6.1.1**) and submitted it to Heritage Western Cape (HWC) for comments (Please refer to **Appendix 5.2.3.5**. for comments). Comments from HWC dated 11 August 2017 stated that since there is no reason to believe that the proposed dam expansion will impact on heritage resources, no further action under Section 38 of the National Heritage Resources Act (Act 25 of 1999) is required. Precautionary mitigation measures as stated above should be implemented.

9.2 Freshwater Impact Assessment

The Freshwater Impact Assessment was conducted by Natasha van Haar from EnviroSwift. Please refer to **Appendix 7.2** for the report.

9.2.1 Key findings

- The watercourse in which the dam is proposed falls within the Southern Coastal Belt Ecoregion and within the Breede Water Management Area (WMA) and Riviersonderend sub-Water Management Area (sub-WMA),
- The quarterly catchment indicated for the project footprint is H60K and the applicable wetland vegetation unit is the East Coast Shale Renostervled, listed as critically endangered.
- The proposed dam will intersect a natural valleyhead seep wetland and floodplain wetland which are both indicated to be within a critically modified condition.
- The catchment in which the proposed dam falls has not been selected as a River Freshwater Ecosystems Priority Area (FEPA).
- According to the Western Cape Biodiversity Spatial Plan for Swellendam Municipality, the proposed dam will intersect an Ecological Support Areas (ESA 2) which is associated with a watercourse and wetland area. (ESA 2 are areas likely severely degraded or with no natural cover remaining *which require restoration*. These areas are not essential for meeting biodiversity targets but play a vital role in supporting the functioning of Critical Biodiversity Areas (CBAs) or protected areas, vital for delivering ecosystem services).
- The proposed dam will be located on an ephemeral watercourse which has been indicated as a combination of two Hydrogeomorphic (HGM) features namely valleyhead seep wetland and floodplain wetland as per the WCBSP. However, as per inspection by EnviroSwift the feature was considered to be more represented of an unchanneled valley bottom wetland.
- The unchanneled valley bottom wetland was dominated with obligate wetland species *Juncus* sp. with scattered, isolated patches of *Scirpus nodosus* and *Phragmites australi.*

- Cultivation of wheat within the wetlands catchment has resulted in decreased surface roughness (less natural vegetation cover), exposure of bare soils and in some areas

compaction of soils. This has decreased the natural infiltration rates of soils and has increased stormwater runoff and wetland flood peaks.

- Three small impoundments have been created in the upper reaches of the unchannelled valley bottom wetland and a road has also been constructed immediately downstream of the area earmarked for the construction of the dam. The features have resulted in the alteration of the natural hydrological flow patterns through the wetland. The dams impede surface flow to downstream wetland habitat. All areas upstream of the impoundments and the road which would have been characterised by seasonal and temporary wetland habitat under natural circumstances remains saturated for longer.
- The stockpiling of rocks within the unchannelled valley bottom wetland has had an impact on the natural flow patterns through the wetland and has resulted in the loss of natural wetland vegetation in stockpile areas.
- An increase in sediment laden stormwater runoff from surrounding disturbed areas has resulted in the erosion and sedimentation.
- The overall wetland health score calculated for the unchannelled valley bottom wetland in its present state falls within Category C – Moderately modified: A moderate change in ecosystem processes and loss of natural habitats has taken place but the natural habitat remains predominantly intact.
- The development of the proposed dam will result in a decrease in the hydrology and vegetation condition of the wetland from a Category C Present Ecological State (PES) (Moderately modified) to a Category E PES (Seriously Modified). The overall health of the wetland after the development of the dam will fall within a Category D PES (Largely modified: A large change in ecosystem processes and loss of natural habitat and biota and has occurred).
- In terms of the Ecological Importance and Sensitivity (EIS). The unchannelled valley bottom wetland was determined to be of a moderate EIS (Wetlands that are considered to be ecologically important and sensitive on a provincial or local scale. The biodiversity of these systems is not usually sensitive to flow and habitat modifications. They play a small role in moderating the quantity and quality of water of major rivers).
- It is considered unlikely that the disturbed and degraded wetland habitat associated with the unchannelled valley bottom wetland will support rare and endangered species or populations of unique species. The wetland is however likely to provide suitable breeding and foraging habitat for faunal species considered to be more common within the region.
- The unchannelled valley bottom wetland is not formally protected, however, the East Coast Shale Renosterveld wetland vegetation group is critically endangered within the region.
- The wetland calculated an overall low PES score (Largely modified), and therefore scored low for ecological integrity.
- The wetland has a low diversity of habitat types.

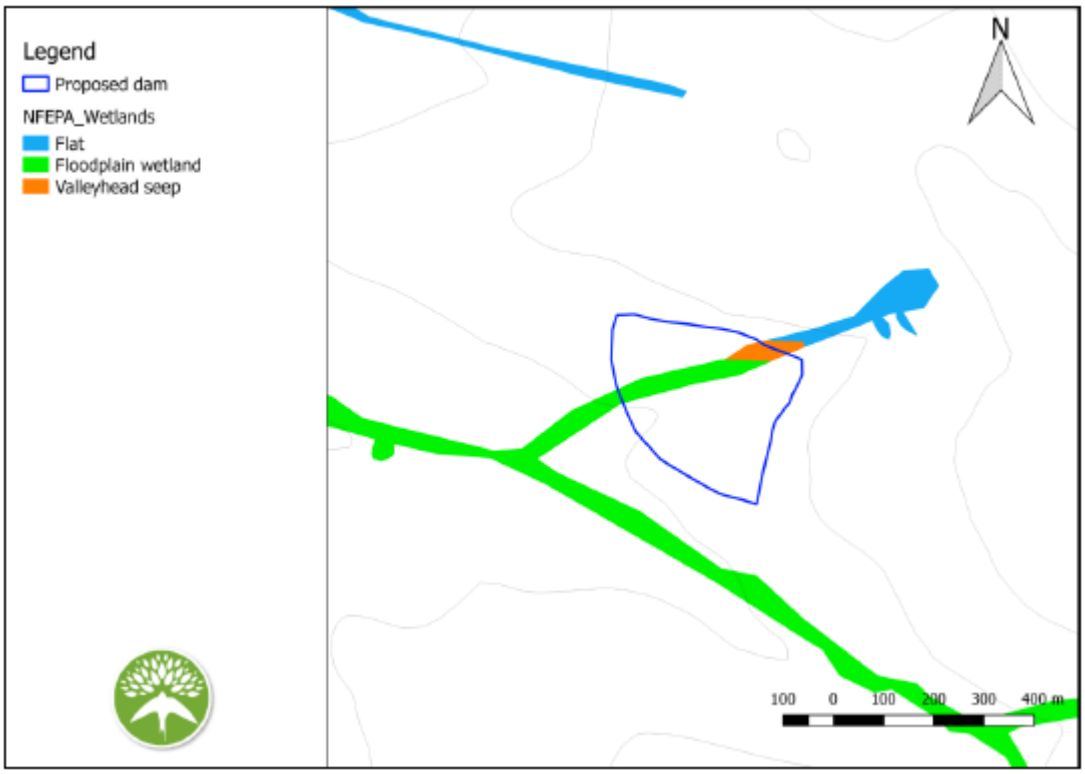

Figure 7: Image from the Freshwater Impact Assessment indicating Wetlands and rivers associated with the proposed dam

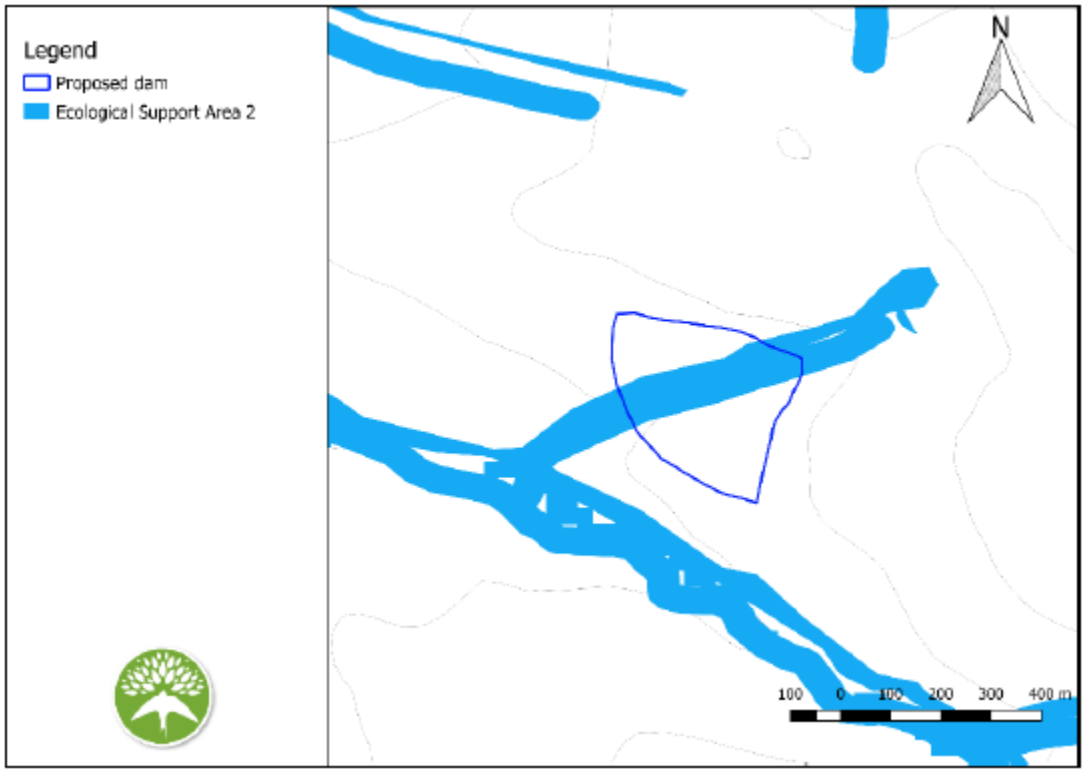

Figure 8: Image from the Freshwater Impact Assessment indicating the ESAs associated with the proposed dam

Figure 9: Unchanneled valley bottom wetland indicated in relation to the proposed dam

9.2.2 Impact Assessment

The following direct impacts are expected to occur during the construction and operational phase of the proposed dam, should it be authorised, taken from the specialist report.

Table 3: Freshwater Impact Assessment from specialist

Assessment of Direct Construction Impact			
Fresh Water Aspect	**Short description**	**Significance rating**	
1. Loss of seasonal and temporary wetland habitat	Seasonal and temporary wetland habitat will be lost from the wetland system during earthmoving activities. The development of the dam will result in the direct loss of ±38% of seasonal and brackish wetland habitat which will be replaced with permanent freshwater wetland habitat during operational phase,	Transformation of the wetland habitat is considered of medium intensity and the impact will be permanent.	
		Without mitigation: Medium	**With mitigation:** N/A
2. Disturbance of wetland habitat due to edge effects	Edge effects of construction related activities such as movement of vehicles, personnel and dumping of excavated material may result in	Disturbance of wetland habitat due to edge effect is considered to be of medium significance and	

	disturbance of wetland vegetation and soils. Existing cultivation activities and rock dumping decreased the Present Ecological State (PES) of the unchanneled valley bottom to a category C (moderately modified)	the impact could remain for a long time. However, with the mitigation measures, intensity and duration of the impact can be decreased to a very low significance.	
		Without mitigation: Medium	**With mitigation:** Very Low
3. Increased runoff, erosion and sedimentation	Increase in stormwater runoff from cleared, disturbed and compacted areas may result in an increase storm flows into the unchanneled valley bottom wetland. This can result in erosion and incision of the wetlands system. Earthmoving activities can result in runoff of sediment into downstream wetland habitat. Straw ballets can be used to intercept sediment and decrease velocity flows,	The impact is of medium intensity and of a medium significance. The use of straw bales will not entirely prevent impact but reduce the significance.	
		Without mitigation: Medium	**With mitigation:** Very Low
4. Water quality impairment	Movement of vehicles through unchanneled valley bottom wetland increase the possibility of contamination of wetland by hydrocarbon spills. The possibility exist that the wetland will be contaminated by runoff cement and other construction related materials. These activities are considered preventable with ongoing inspection of vehicles/ machinery and use construction material with no pollution/leaching potential.		
		Without mitigation: Very low	**With mitigation:** Very Low

Assessment of Direct Operational Impact		
Fresh Water Aspect	**Short description:**	**Significance rating**
1. Alternation of the hydrological regime and vegetation characteristics of the unchanneled	The pumping of freshwater into the dam during operational phase will result in a change of the hydrological regime of the wetland and result in prolonged saturation of soil and extended periods of inundation. As a	The overall impact is considered to be of a medium significance. The implementation of mitigation measures will not prevent the alteration

valley bottom wetland	result, seasonal and temporary vegetation communities removed during construction will not recover during the operational phase. This vegetation might only recolonise the shallow fringes of the dam and be replaced by a less diverse obligate wetland vegetation community where water depth increases. The dam will not completely impede the flow through the wetland. Freshwater will be abstracted from an upstream tributary. Brackish water currently conveyed by the portion of the unchanneled valley bottom wetland upslope of the proposed dam will be intercepted by a pipeline which will convey the water below the dam ad discharge water into a portion of the wetland downstream of the dam. Therefor the main impact would be the alternation of the hydrological regime of areas directly upstream of the dam.	of the hydrology of wetland areas upstream of the dam and the impact will remain medium as long as the dam is in use.	
		Without mitigation: Medium	**With mitigation:** N/A
2. Erosion of downstream wetland habitat	Brackish water currently conveyed by the portion of the unchanneled valley bottom wetland upslope of the proposed dam will be intercepted by a pipeline which will convey the water below the dam ad discharge water into a portion of the wetland downstream of the dam. The concentrated discharge of water from the pipe will result in erosion and incision of the downstream wetland area where water is released. Concentrated release of bottom water from the dam is likely to result in erosion at the area where water is discharged.	The impact is considered medium significance prior to the implementation of mitigation measures and promotion of diffuse flow at discharge point will reduce the overall impact to very low.	
		Without mitigation: Low	**With mitigation:** Very Low

9.2.3 Mitigation measures:

The following section will discuss the mitigation measures as recommended by the specialist for the mitigation of direct construction and operational phases of the proposed project on the receiving environment.

Mitigating the loss of seasonal and temporary habitat during construction phase:

No mitigation measures are suggested as with the construction of the dam, loss of temporary habitat will occur regardless of the implementation of mitigation measures.

Mitigating the disturbance of wetland habitat due to edge effects during construction phase:

- Physically demarcate the footprint of the proposed dam and strictly prohibit any vehicles or construction related activities outside of the demarcated footprint area. This can be done with danger tape, which should be removed once the construction activities have been completed.
- Immediately rip compacted soil to a depth of 300mm and reprofile the area according to natural terrain units where any accidental disturbance to portions of the unchanneled valley bottom wetland falling outside of the demarcated construction footprint area has taken place. If the disturbed area will be prone to erosion (sheet runoff or formation of gullies), it is recommended that straw bales (not Lucerne or hay) are used to intercept the bulk of the runoff. The bales should be placed strategically along contour lines and pegged. Disturbance and removal of vegetation within the immediate vicinity of the area where the bales are placed should be kept to a minimum. Sediment should be cleared manually as needed.
- If stockpiling of any material is required, stockpiles must be located at least 32m from the border of the unchannelled valley bottom wetland.
- Prohibit the dumping of excess excavated material within the unchannelled valley bottom wetland.
- Once construction has been completed all construction waste, rubble, and equipment must be removed from the construction area.
- Once construction of the dam has been completed, remove alien and invasive individuals, manually as far as practically possible, from the construction footprint as well as any areas accidentally disturbed. These areas should be monitored in monthly intervals and seedlings removed as needed. The use of herbicides should be avoided. However, if necessary, only herbicides which have been certified safe for use in wetlands/aquatic environments by an independent testing authority may be considered. Cover removed alien plant material properly when transported, to prevent it from being blown from vehicles and burn on a bunded surface where no stormwater runoff is expected.

Mitigating increased runoff, erosion and sedimentation during construction phase:

- Implement erosion control measures (e.g. strategically placed straw bales, diverting stormwater away from areas susceptible to erosion etc.) in order to prevent erosion and sedimentation of downstream wetland areas.
- Strategically divert runoff from areas where earth moving activities is undertaken in the direction of pegged straw bales where required, in an attempt to intercept sediment-laden runoff before it reaches downstream wetland habitat.
- Check straw bales weekly to ensure these are still intact (can be done by the proponent or a reliable farm employee) and cleared of sediment as needed.
- Protect stockpiles, if required, from erosion using tarp or erosion blankets.
- The contractor or proponent must check the site for erosion damage and sedimentation after every heavy rainfall event. Should erosion or sedimentation be noted, immediate corrective measures must be undertaken. Rehabilitation measures may include the manual removal of accumulated sediment, the filling of erosion gullies and rills, and the stabilization of gullies with silt fences.
- Development of the dam should be undertaken during the dry summer months.
- Seed the dam wall after construction with indigenous grass that has a good soil binding capacity such as *Cynodon dactylon* or stabilised with geotextiles in order to prevent erosion.

Mitigating water quality impairment during construction phase:

- Avoid the use of infill material or construction material with pollution / leaching potential.
- Clean up any spillages (e.g. concrete, oil, fuel), immediately. Remove contaminated soil and dispose of it appropriately.
- Store fuel, chemicals and other hazardous substances in suitable secure weather-proof containers with impermeable and bunded floors to limit pilferage, spillage into the environment, flooding or storm damage.
- Inspect all storage facilities and vehicles daily for the early detection of deterioration or leaks.
- Dispose of used oils, wash water from cement and other pollutants at an appropriate licensed landfill site. Disposal of any of these within the valley bottom wetland should be strictly prohibited.
- Dispose of concrete and cement-related mortars in an environmental sensitive manner (can be toxic to aquatic life). Washout should not be discharged into the valley bottom wetland.
- Provide portable toilets where work is being undertaken. These toilets must be located at least 32m from the boundary of the valley bottom wetland and must be serviced regularly in order to prevent leakage/spillage.

Mitigating the alteration of the hydrological regime and vegetation characteristics of the unchanneled valley bottom wetland during operational phase:

The implementation of mitigation measures will not prevent the alteration of the hydrology of wetland areas upstream of the dam and the impact will therefore remain medium (negative) as long as the dam remains in use.

Mitigating erosion of downstream wetland habitat during operational phase:

- Promote diffuse flow at discharge areas. Diffuse flow may be promoted with the use of perforated pipes at outlets or with the use of spreaders or rip-rap mattresses at discharge points.
- If vegetation does not establish after construction, revegetate discharge areas with wetland species indigenous to the area. Vegetation will aid in dispersing concentrated flows and will decrease the velocity and erosive potential of flows. Furthermore, the roots of vegetation will aid in binding the soils thereby reducing the possibility of erosion.
- Monitor discharge points for erosion and incision on a quarterly basis and after heavy rainfall events. Should erosion and incision be noted, immediate corrective measures must be undertaken. Rehabilitation measures may include the filling of erosion gullies and rills, and the stabilization of gullies with silt fences.

9.2.4 Conclusion:

The unchannelled valley bottom wetland was calculated to fall within a Category C PES and is considered to be of a moderate EIS. The development of the proposed dam will result in a decrease in the hydrology and vegetation condition of the wetland from a Category C PES (Moderately modified) to a Category E PES (Seriously Modified). The overall health of the wetland after the development of the dam will fall within a Category D PES (Largely modified). It is therefore recommended that the PES of the wetland is maintained as a Category D PES and the PES should not be allowed to decrease any further. Furthermore, the wetland has been indicated as a Category 2 ESA (WCBSP, 2017) for which the objectives are to restore or manage the feature to minimize impacts on ecological processes and ecological infrastructure functioning.

Following the assessment of direct impacts, it can be surmised that the significance of the majority of the impacts associated with the proposed development of the dam can be reduced with the implementation of effective mitigation measures. The exception would be the loss of temporary and seasonal wetland habitat during the construction phase and alteration of the hydrological regime and vegetation characteristics during the operational phase which both rated a medium (negative) impact significance and for which no practical mitigation would be possible.

Taking into consideration the degree to which the ESA wetland in which the development of the dam is proposed, has already been transformed, as well as the high potential of effectively mitigating most construction and operational related impacts, it is the opinion of the specialist that the proposed project may proceed. It should however be noted that the proposed construction of the dam will require Environmental Authorisation in terms of the NEMA Environmental Impact Assessment Regulations (2014) as well as authorisation from DWS in terms of Section 21 (c) and (i) of the NWA.

9.3 Botanical Impact Assessment

The Botanical Impact Assessment was conductive by Dr Dave Mc Donald from Bergwind Botanical Surveys & Tours cc who has a sound knowledge of the area. Please refer to **Appendix 7.3** for the full report.

9.3.1 Key findings:

- A single Critically Endangered (A1) vegetation type, Central Rûens Shale Renosterveld would have been the original vegetation type found over an extensive area and over most of Van der Watts Kraal. At the study site this vegetation type persists as a small remnant on both sides of the stream below the existing two small dams.
- The remnant renosterveld was found to be species-rich but not all species were in flower or were identifiable even though the survey was undertaken in spring. No species of conservation concern were recorded but the importance of the remnant should nevertheless not be underestimated.
- It is estimated that approximately 1.5 ha of the remnant renosterveld would be lost due to dam construction and inundation (operation). This is roughly half of the renosterveld found along the stream.
- The impact of the loss of Central Rûens Shale Renosterveld at a local scale at the Dasberg Dam site would result in Medium negative impact but the proposed conservation easement and recommended 'Search and Rescue' (see below) would provide mitigation for the lost habitat.
- Plants that can be relocated such as geophytes (bulbs) and succulents e.g. Trichodiadema sp. should be located, marked and rescued before the dam-building commences. The rescued plants should be relocated into the remaining part of the remnant not affected by the dam or to the area of the conservation easement.
- The proposed site falls within an Ecological Support Area 2 (ESA2) and thus has a conservation merit but is not essential to meeting conservation targets.
- The area is also classified as a Freshwater Ecosystem Priority Area.

- No Red List Species were encountered during the survey, but the possibility of the presence of *Ixia longituba* may be encountered.

9.3.2 Impact Assessment:

As per the specialist report the impact of the proposed Dasberg Dam development on the vegetation and habitat are considered with respect to:

- Loss of vegetation type and habitat including plant species due to construction and operational activities;
- Loss of ecological processes due to construction and operational activities.

Loss of vegetation type and habitat including plant species due to construction and operational activities:

If development option is followed there would be a **MEDIUM NEGATIVE** impact on the remnant renosterveld, but a very **LOW NEGATIVE** impact on the cultivated area. After mitigation, the impact would be **LOW NEGATIVE** on the natural vegetation.

Table 4.1: Botanical Impact Assessment from specialist

CRITERIA	'NO GO' ALTERNATIVE		PREFERRED ALTERNATIVE Construction of Dasberg Dam	
Nature of direct impact (local scale)	**Loss of Central Rûens Shale Renosterveld**			
	WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION
Extent	Local	Local	Local	Local
Duration	Long-term	Long-term	Long-term	Long-term
Intensity	Low	Low	High	High
Probability of occurrence	Probable	Probable	Probable	Probable
Confidence	High	High	High	High
Significance	Negligible	Negligible	Medium negative	Low negative
Nature of Cumulative impact	**Loss of Central Rûens Shale Renosterveld**			
Cumulative impact prior to mitigation	Low Negative			
Degree to which impact can be reversed	Not reversible			
Degree to which impact may cause irreplaceable loss of resources	Medium			
Degree to which impact can be mitigated	Medium			
Proposed mitigation	Search and rescue of relocatable plants; establishment of a conservation easement elsewhere on the farm Van Der Watts Kraal.			
Cumulative impact post mitigation	Low negative			
Significance of cumulative impact (broad scale) after mitigation	Low negative			

Loss of Ecological Processes:

The remaining fragment of Central Rûens Shale Renosterveld is small and has low connectivity by corridors to larger tracts of this vegetation. The natural habitat supports active birdlife and small mammals no doubt use this area as a refuge. Therefore, there would be a net loss of ecological processes in the dam inundation area. However, description and quantification of the ecological processes is not possible and only an estimate of the impact can be made. For that reason, the impact is rated as **MEDIUM NEGATIVE**, as applied only to the remnant natural vegetation that would be lost. No true mitigation would be possible so the impact would remain as **MEDIUM NEGATIVE.** In the grain-fields practically no ecological processes would be lost so the impact would be **VERY LOW NEGATIVE.**

Table 4.2: Botanical Impact Assessment from specialist

CRITERIA	'NO GO' ALTERNATIVE		PREFERRED ALTERNATIVE Construction of Dasberg Dam	
Nature of direct impact (local scale)	**Loss of ecological processes**			
	WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION
Extent	Local	Local	Local	Local
Duration	Long-term	Long-term	Long-term	Long-term
Intensity	Low	Low	High	High
Probability of occurrence	Probable	Probable	Probable	Probable
Confidence	High	High	High	High
Significance	Negligible	Negligible	Medium negative	Medium negative
Nature of Cumulative impact	**Loss of ecological processes**			
Cumulative impact prior to mitigation	Low Negative			
Degree to which impact can be reversed	Not reversible but ecological processes would continue elsewhere			
Degree to which impact may cause irreplaceable loss of resources	Low			
Degree to which impact can be mitigated	Low			
Proposed mitigation	No mitigation possible			
Cumulative impact post mitigation	Low negative			
Significance of cumulative impact (broad scale) after mitigation	Low negative			

Indirect Impacts:

By definition indirect impacts occur away from the 'action source' i.e. away from the development site. The impact assessed here is specifically how the proposed development would have an indirect impact on vegetation and flora away from the development site. Indirect impacts would probably be insignificant if any

Please refer to **Appendix 7.3** for the specialist report which explains the methodology used in determining the impacts.

9.3.3 Mitigation Measures:

Mitigating the loss of vegetation type and habitat including plant species due to construction and operational activities:

- It is strongly recommended that there should be intensive 'Search and Rescue' in the area of renosterveld that would be lost (this would pertain particularly to bulbs and succulents) and that the rescued plant should be relocated into the area from waypoint VDW5 westwards that would not be affected by the dam. Please refer to the specialist report Appendix 6.3. The waypoint refers to an area below the dam wall, this area should be receptor area for rescued plants.
- A working zone for the dam wall must be determined to conserve as much of the remaining renosterveld as possible.
- The landowner has entered into an agreement concerning a 'conservation easement' whereby another area of renosterveld is being set aside in compensation for the loss caused by the dam. That is an acceptable measure, but it is still advocated that as much of the remnant natural vegetation as possible at the Dasberg Dam site should be conserved.

Mitigating the loss of Ecological Processes:

- No mitigation for loss of ecological processes would be possible at the site since the habitat would be lost. However, those (similar) processes would continue in the area below the dam wall, albeit in a smaller area of natural habitat.
- The conservation easement on the farm Van der Watts Kraal would compensate for the loss of the remnant renosterveld at the Dasberg Dam site. It is assumed that since the habitat is renosterveld, the area of the conservation easement is likely to support similar ecological processes as those found at the proposed dam site.

9.3.4 Conclusion:

The greater part of the farm Van der Watts Kraal has been transformed to intensive agriculture; mainly cereal farming and livestock production. Very little Central Rûens Shale Renosterveld remains and what remains has significant conservation value. These areas must generally be avoided with no further disturbance permitted. However, in some circumstances there is no other logical place for a dam except in the in-stream situation and where there may be, as is the case here, remnant renosterveld vegetation. It is unfortunate to lose any more renosterveld notwithstanding that the area has a relatively 'low' classification (ESA2) but the positive spin-off is that the dam project has stimulated the intention of the landowner to set aside an area of intact Central Rûens

Shale Renosterveld. This would successfully compensate for the localized loss of the renosterveld at the Dasberg Dam site. The overall result of the impact assessment is that the 'No Go' option would allow the status quo to continue which would have a **LOW NEGATIVE** impact on the site. The proposed Dasberg Dam would have a **LOW NEGATIVE** impact after mitigation, and given positive actions, both the conservation easement and 'Search & Rescue' as mitigation, the development of the dam is supported from a botanical perspective.

10. SUMMARY OF IMPACTS & CUMMULATIVE EFFECT

10.1 Summary of Impacts

Please refer to Appendix 9 for a summary of the project assessment and significance rating for pre-construction, construction, operations and rehabilitation of the proposed development, as well as a summary of mitigation measure.

The following table is a summary of all the impacts assessed, taking in to considerations the risk assessment of the EAP as well as the specialist report for the development of the proposed dam and associated infrastructure for the preferred site alternative.

Table 5: Summary of Impact Significance

Study	Impact	Significance No Mitigation	Significance With Mitigation
Water	Loss of wetland habitat	Medium Significance	Medium Significance
	Disturbance of wetland habitat due to edge effects	Medium Significance	Low Significance
	Increased runoff, erosion and sedimentation	Medium Significance	Very Low Significance
	Water quality impairment	Very Low Significance	Very Low Significance
	Alteration of the hydrological regime and vegetation of unchanneled valley bottom	Medium Significance	Medium Significance
	Erosion of downstream wetland habitat	Medium Significance	Very Low Significance
Botanical	Loss of Central Rûens Shale Renosterveld	Medium Significance	Medium Significance
	Loss of Ecological Processes	Medium Significance	Low Significance
	Soil Contamination	Very Low Significance	Very Low Significance
Heritage	Heritage resources	Very Low Significance	Very Low Significance
Dust	Dust from topsoil removal, construction and rehabilitation	Very Low Significance	Very Low Significance
No-go development			

10.2 Cumulative Effect

Cumulative effect in relation to the activity means the past, current and reasonably of future impact of an activity, considered together with the impact of activities associated with that activity, that itself may not be significant but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities.

There has been such as wide spread degradation of Central Rûens Shale Renosterveld in the Overberg area that the proposed dam would not add significantly to the loss of this vegetation type. If development continues the impact on cultivated land would be a very of low significance. The impact on the remnant Central Rûens Shale Renosterveld (the loss of about 1.5 ha) would be of medium significance, in context, with mitigation this impact would be of low significance. However, now that there is so little natural vegetation left the cumulative effect of the loss of even a small area is much more significance. In the current context therefore, the cumulative impact is at least medium to high significance.

In terms of freshwater systems, watercourses within the region in which the dam is located have been impacted as a result of past and present agricultural and anthropogenic activities. The development of the dam within the unchanneled valley bottom wetland will result in additional transformation of the critically endangered East Coast Shale Renosterveld wetland vegetation type within the region. However, the transformation of 1,44 ha of already disturbed wetland habitat is not likely to result in a significant cumulative impact to critically endangered wetland habitat within the region.

Additionally, the area selected for the dam development falls within a Category 2 ESA. These areas are not essential for meeting biodiversity targets but play and important role in supporting the functioning of Critical Biodiversity Areas (CBAs) or protected areas and are often vital for delivery ecosystem services. The management objectives for Category 2 ESAs is to restore or manage the features to minimize impacts on ecological processes and ecological infrastructure functioning, especially soil and water related services, and to allow for faunal movement. Although the development of the dam will result in unavoidable impact of the ESA, it is not considered detrimental for meeting regional biodiversity targets.

11. RECOMMENDATIONS & CONCLUSION

Mitigation measures as recommended by the specialists must be enforced if the proposed development of the dam were to be approved. These mitigation measures and recommendations are discussed in Section 9 of this report and have been included in the Section 6 of the Environmental Impact Report (EMPr) attached as **Appendix 12**. Please also refer to the method statement in **Appendix 9.**

The following specialist studies were undertaken as part of the Environmental Impact Assessment:

- Heritage Screener
- Freshwater Impact Assessment
- Botanical Impact Assessment

The specialist studies and the information provided within the EIA Report, indicates that the proposed Dasberg Dam development does not pose any significant impacts and can be implemented with appropriate mitigation.

In terms of the need and desirability of the proposed development of the Dasberg dam, the need exists for a storage dam which would provide a sufficient supply of irrigation water that would be of critical importance to the success and feasibility of the BEE business proposal to establish 105ha of citrus orchards. The establishment of the citrus branch will create the opportunity to increase staff on the farm. According to the business plan (**Appendix 3**), there are currently 13 families who will directly benefit from the expansion of the citrus orchards, of which 3 are female workers and the main breadwinners for their families.

Access to the dam will be via existing farm roads, no additional roads will need to be constructed. The farm is accessible form the N2. The location (Site Alternative 1, which is the) was also chosen to ensure the project life cycle cost are minimised (gravity feed vs. pumping station cost), as water will glow with gravitation from the water source to the dam. This would also reduce the footprint on the environment as no pump station will be necessary. The proposed site location is preferred due to the favourable soil and foundation conditions. The site is also in close proximity to the source of water and the citrus orchards will be developed on the same property as the proposed dam. Neighbours will not lose agricultural land.

The “no-go” option, which is the option of not developing the proposed Dasberg Dam on the property. Although the no-go development might result in no potential negative environmental impacts, especially on the vegetation on the development site, the direct and indirect socio-economic benefits of not constructing the dam will not be realised and the need for employment opportunities in the Overberg will not be met.

The potential impact on the sense of place of the proposed dam has also been considered. The surrounding area is characterised by agricultural activities, as well as a number of farm dams in

the local area, and the proposed dam will therefore not be uncharacteristic for the area. The sense of place is not expected to be altered by the proposed dam, and no further studies are suggested.

According the Heritage Screener conducted and comments from Heritage Western Cape, the proposed development of the dam will not have any negative significant impacts on the heritage resources of the area.

According the Freshwater Impact Assessment it can be summarised that the significance of the majority of the impacts associated with the proposed development of the dam can be reduced with the implementation of effective mitigation measures. The exception would be the loss of temporary and seasonal wetland habitat during the construction phase and alteration of the hydrological regime and vegetation characteristics during the operational phase which both rated a medium (negative) impact significance and for which no practical mitigation would be possible. Taking into consideration the degree to which the ESA wetland in which the development of the dam is proposed, has already been transformed, as well as the high potential of effectively mitigating most construction and operational related impacts, it is the opinion of the specialist that the proposed project may proceed.

In terms of the Botanical Impact Assessment, the greater part of the farm Van der Watts Kraal has been transformed to intensive agriculture. Very little Central Rûens Shale Renosterveld remains and what remains has significant conservation value. These areas must generally be avoided with no further disturbance permitted. However, in some circumstances there is no other logical place for a dam except in the in-stream situation and where there may be, as is the case here, remnant renosterveld vegetation. It is unfortunate to lose any more renosterveld notwithstanding that the area has a relatively 'low' classification (ESA2) but the positive spin-off is that the dam project has stimulated the intention of the landowner to set aside an area of intact Central Rûens Shale Renosterveld. This would successfully compensate for the localized loss of the renosterveld at the Dasberg Dam site. The overall result of the impact assessment is that the 'No Go' option would allow the status quo to continue which would have a low negative impact on the site. The proposed Dasberg Dam would have a low negative impact after mitigation, and given positive actions, both the conservation easement and 'Search & Rescue' as mitigation, the development of the dam is supported from a botanical perspective.

Considering all the information, it is not envisaged that this Dasberg dam development will have a significant negative impact on the environment, and the socio-economic benefits are expected to greatly outweigh any negative impacts.

It is therefore recommended that the proposed Dasberg dam development (**Alternative A**) be supported and be authorised with the necessary conditions of approval, subject to the implementation of the recommended enhancement and mitigation measures contained in Section 9 of the report and Section 6 of the EMPr (**Appendix 6**).

12. DETAILS AND EXPERTISE OF THE EAP

This Draft Scoping Report was prepared by Inge Erasmus who has a BA Honours in Geography and Environmental Studies from Stellenbosch University. Before completing her honours degree Inge gained practical experience as a junior environmental consultant at Hatch Goba in Johannesburg from 2014 until 2015. Inge acted as an environmental control officer on a variety of projects in the Northern Cape, conducting environmental compliance audits, as well as being part of a project team working on a major resettlement project for Kumba Iron ore. Inge joined Enviro Africa in February 2017, generally performing duties as an environmental assessment practitioner with regards to NEMA EIA applications. The whole process and report was supervised by Peet Botes who has more than 10 years experience in environmental management and environmental impact assessments.

Mr Peet Botes is the supervising EAP. Please refer to **Appendix 10** for CVs.

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