BASIC ASSESSMENT REPORT
IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) AND ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS, 2014 (AS AMENDED)

October 2017

PROJECT TITLE

BLACK ORCHID FARMING (PTY.) LTD: PROPOSED ENLARGEMENT OF ZWARTFONTEIN DAM
PORTION 8 & RE FARM 792

[NOVEMBER 2019]

REPORT TYPE CATEGORY	REPORT REFERENCE NUMBER	DATE OF REPORT
Pre-Application Basic Assessment Report (if applicable)[1]		
Draft Basic Assessment Report[2]		
Final Basic Assessment Report[3] or, if applicable Revised Basic Assessment Report[4] (strikethrough what is not applicable)		

Notes:

1. In terms of Regulation 40(3) potential or registered interested and affected parties, including the Competent Authority, may be provided with an opportunity to comment on the Basic Assessment Report prior to submission of the application but must again be provided an opportunity to comment on such reports once an application has been submitted to the Competent Authority. The Basic Assessment Report released for comment prior to submission of the application is referred to as the "Pre-Application Basic Assessment Report". The Basic Assessment Report made available for comment after submission of the application is referred to as the "Draft Basic Assessment Report". The Basic Assessment Report together with all the comments received on the report which is submitted to the Competent Authority for decision-making is referred to as the "Final Basic Assessment Report".

2. In terms of Regulation 19(1)(b) if significant changes have been made or significant new information has been added to the Draft Basic Assessment Report , which changes or information was not contained in the Draft Basic Assessment Report consulted on during the initial public participation process, then a Final Basic Assessment Report will not be submitted, but rather a "Revised Basic Assessment Report", which must be subjected to another public participation process of at least 30 days, must be submitted to the Competent Authority together with all the comments received.

DEPARTMENTAL REFERENCE NUMBER(S)

Pre-application reference number:	
File reference number (EIA):	
NEAS reference number (EIA):	
File reference number (Waste):	
NEAS reference number (Waste):	
File reference number (Air Quality):	
NEAS reference number (Air Quality):	
File reference number (Other):	
NEAS reference number (Other):	

CONTENT AND GENERAL REQUIREMENTS

Note that:

1. The content of the Department's Circular EADP 0028/2014 (dated 9 December 2014) on the "One Environmental Management System" and the Environmental Impact Assessment ("EIA") Regulations, 2014 (as amended), any subsequent Circulars, and guidelines must be taken into account when completing this Basic Assessment Report Form.
2. This Basic Assessment Report is the standard report format which, in terms of Regulation 16(3) of the EIA Regulations, 2014 (as amended) must be used in all instances when preparing a Basic Assessment Report for Basic Assessment applications for an environmental authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA")and the EIA Regulations, 2014 (as amended) and/or a waste management licence in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) ("NEM:WA"), and/or an atmospheric emission licence in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) ("NEM:AQA") when the Western Cape Government: Environmental Affairs and Development Planning ("DEA&DP") is the Competent Authority/Licensing Authority.
3. This report form is current as of October 2017. It is the responsibility of the Applicant/ Environmental Assessment Practitioner ("EAP") to ascertain whether subsequent versions of the report form have been released by the Department. Visit the Department's website at **http://www.westerncape.gov.za/eadp** to check for the latest version of this checklist.
4. The required information must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The tables may be expanded where necessary.
5. The use of "not applicable" in the report must be done with circumspection. All applicable sections of this report form must be completed. Where "not applicable" is used, this may result in the refusal of the application.
6. While the different sections of the report form only provide space for provision of information related to one alternative, if more than one feasible and reasonable alternative is considered, the relevant section must be copied and completed for each alternative.
7. Unless protected by law, all information contained in, and attached to this report, will become public information on receipt by the competent authority. If information is not submitted with this report due to such information being protected by law, the applicant and/or EAP must declare such non-disclosure and provide the reasons for believing that the information is protected.
8. Unless otherwise indicated by the Department, one hard copy and one electronic copy of this report must be submitted to the Department at the postal address given below or by delivery thereof to the Registry Office of the Department. Reasonable access to copies of this report must be provided to the relevant Organs of State for consultation purposes, which may, if so indicated by the Department, include providing a printed copy to a specific Organ of State.
9. This Report must be submitted to the Department and the contact details for doing so are provided below.
10. Where this Department is also identified as the Licencing Authority to decide applications under NEM:WA or NEM:AQA, the submission of the Report must also be made as follows, for-
    - Waste management licence applications, this report must also (*i.e.*, another hard copy and electronic copy) be submitted for the attention of the Department's Waste Management Directorate (tel: 021-483-2756 and fax: 021-483-4425) at the same postal address as the Cape Town Office.
    - Atmospheric emissions licence applications, this report must also be (*i.e.*, another hard copy and electronic copy) submitted for the attention of the Licensing Authority or this Department's Air Quality Management Directorate (tel: 021 483 2798 and fax: 021 483 3254) at the same postal address as the Cape Town Office.

DEPARTMENTAL DETAILS

CAPE TOWN OFFICE		**GEORGE REGIONAL OFFICE**
REGION 1 **(City of Cape Town & West Coast District)**	**REGION 2** **(Cape Winelands District & Overberg District)**	**REGION 3** **(Central Karoo District & Eden District)**
Department of Environmental Affairs and Development Planning Attention: Directorate: Development Management (Region 1) Private Bag X 9086 Cape Town, 8000 Registry Office 1st Floor Utilitas Building 1 Dorp Street, Cape Town Queries should be directed to the Directorate: Development Management (Region 1) at: Tel.: (021) 483-5829 Fax: (021) 483-4372	Department of Environmental Affairs and Development Planning Attention: Directorate: Development Management (Region 2) Private Bag X 9086 Cape Town, 8000 Registry Office 1st Floor Utilitas Building 1 Dorp Street, Cape Town Queries should be directed to the Directorate: Development Management (Region 2) at: Tel.: (021) 483-5842 Fax: (021) 483-3633	Department of Environmental Affairs and Development Planning Attention: Directorate: Development Management (Region 3) Private Bag X 6509 George, 6530 Registry Office 4th Floor, York Park Building 93 York Street George Queries should be directed to the Directorate: Development Management (Region 3) at: Tel.: (044) 805-8600 Fax: (044) 805 8650

TABLE OF CONTENTS:

ACRONYMS USED IN THIS BASIC ASSESSMENT REPORT AND APPENDICES:

BAR	Basic Assessment Report
CBA	Critical Biodiversity Area
DEA	National Department of Environmental Affairs
DEA&DP	Western Cape Government: Environmental Affairs and Development Planning
DWS	National Department of Water and Sanitation
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
ESA	Ecological Support Area
HWC	Heritage Western Cape
I&APs	Interested and Affected Parties
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM:AQA	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
NEM:ICMA	National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008)
NEM:WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
PPP	Public Participation Process

DETAILS OF THE APPLICANT

Applicant / Organisation / Organ of State:	Black Orchid Farming Pty (Ltd)		
Contact person:	Ms Mine van Wyk		
App Postal address:	P.O. Box 6100 Roggebaai		
Telephone:	021 421 2129	Postal Code:	8012
Cellular:	082 5511 6036	Fax:	021 421 0510
E-mail:	Mine.van.wyk@uff.co.za		

DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER ("EAP")

Name of the EAP organisation:	EnviroAfrica		
Person who compiled this Report:	Inge Erasmus under supervision of Bernard De Witt		
EAP Reg. No.:			
Contact Person (if not author):			
Postal address:	P.O. Box 5367 Helderberg		
Telephone:	(021) 851 1616	Postal Code:	7135
Cellular:	0834170800	Fax:	(086)512 0154
E-mail:	admin@enviroafrica.co.za / inge@enviroafrica.co.za		
EAP Qualifications:	Inge – BA Hons Geography and Environmental Studies Bernard - B. Sc. in Forestry and a B. A. (Hons) in Public Administration		

Please provide details of the lead EAP, including details on the expertise of the lead EAP responsible for the Basic Assessment process. Also attach his/her Curriculum Vitae to this BAR.

Inge completed her BA Honours Degree in Geography and Environmental Studies at Stellenbosch University in 2016. 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 EnviroAfrica in February 2017, generally performing duties as an environmental assessment practitioner with regards to NEMA EIA applications. Inge is currently busy with a variety of projects of which include Basic Assessments and Waste License Applications for mining and development related projects in the Northern Cape. She is also in the process of conducting a variety of Scoping and Environmental Impact Assessments for projects in the Western Cape, obtaining Environmental Authorisation for new storage dams as well as new agricultural developments.

Bernard: After qualifying with a B. Sc. in Forestry and a B. A. (Hons) in Public Administration at the University of Stellenbosch Bernard joined the Department of Forestry as an Indigenous Forest Planner in 1983, going on to become Manager of the Table Mountain Reserve with the Cape Town Council. He then joined Cape Nature Conservation (CNC) and headed its Conservation Planning Section before taking up the position of District Manager of the Boland area (inc. the Hottentots Holland and Kogelberg). As a Regional Ecologist, he co-ordinated managerial and scientific inputs into Provincial Nature Reserves in the Boland, Overberg and West Coast regions. For the last four years of his employment he assessed and evaluated development applications, from an environmental perspective, on behalf of CNC (now DEA&DP). Since he left DEA&DP 10 years ago he has been involved in environmental consulting in the private sector as a member of **EnviroAfrica**.

CVs of the EAP Appendix L

EXECUTIVE SUMMARY OF THE BASIC ASSESSMENT REPORT:

Proposed Project:

Black Orchid Farming proposed the enlargement of the existing Zwartfontein dam on Portion 8 & RE of the Farm Zwartfontein No. 792, Wellington of which an existing water use license is in place. The proposed enlargement of the dam will provide insurance of supply for irrigation of the existing irrigation areas. The recent drought in the Western Cape and uncertainties of the impact of Climate change are the major drivers of this project.

The Water Use License Application will include the following:

- Section 21 (b) – storing of water with a volume of 765 000m³
- Section 21 (c) & (i) – impeding or diverting/altering the bed, banks of watercourse for all associated infrastructure of the propped development, as described below.

The proposed dam will be filled with water from the Berg River for the irrigation of fruit orchards (table grapes and citrus). the dam will be filled from an existing abstraction point with existing water use rights enlisted under the Berg River Irrigation Board. The existing abstraction point (as shown in Figure 1 below) will remain as is.

According to the Engineers Technical Report from Ingerop, Appendix K, the enlargement of the existing Zwartfontein dam will include the following developments:

1. **Enlargement of Zwartfontein Dam (Design Option 10 - Alternative A)**

- Enlargement of the existing Zwartfontein dam from a storage capacity of 150 000m³ with an existing wall height of 11.9m to a total storage capacity of 915 000m³ with a 22.5m wall. This gives an increase in capacity of 765 000m³ and an increase in wall height of 10.6m
  Existing dam footprint is currently at ±3.8ha (3800m²) and will be increased to ±11ha.
  The footprint of the new slipway and footprint of the new pumphouse (discussed below) will give a total footprint of ±14ha (140 000m²) of which 3,8ha (3800m²) is existing/ transformed. A new disturbance footprint of approximately 10,2 ha (102 0000m²) is expected. Various design options were investigated.

Due to the downstream increase of the dam wall, associated dam infrastructure such as the existing pumphouse including compost storage facility, outlet pipe and Eskom electrical infrastructure will have to be relocated. The dam enlargement will inundate the existing access road around the existing dam and therefore a new access road around the dam footprint is proposed.

2. **Relocation of Pumphouse**

- The exiting pumphouse is made out of two sections: (see figure 1 below). The pump station comprising of pumps, filters and compost pumps as well as compost tanks stored in a bunded area.
- With the dam enlargement and raising of the dam wall it is proposed that the pumphouse and compost storage facility be split in two section and relocated.

3. **Replacement and extension of outlet pipeline**

- Replacement and extension of the existing outlet pipeline is proposed. It is proposed that the pipeline be replaced with a new pipeline of 500mm Ø. The total pipeline length is expected to be 265mm and will connect to the relocated pumphouse.

4. **Relocation of Eskom Infrastructure**

- Relocation of the existing Eskom electrical infrastructure, located directly below the existing dam embankment to downstream of the raised embankment footprint. Relocation as per Eskom legal requirements.

5. **Relocation of irrigation pipelines**

- Relocation and extension of irrigation pipelines. Pipeline Ø will vary from 110mm to 250 mm and will be ± 1150m in length.
  Pipelines to fall within ploughed land.

6. **Construction of access road**

- The existing access roads around the existing dam footprint will be inundated by the dam enlargement. It is therefore proposed that a 10m wide and 1600m long road be constructed along the dam footprint.

Site Description:

The dam is located on Portion 8 and RE of Farm Zwartfontein 792
The SG Digit code is: C04600000000079200000; C04600000000079200008
The proposed dam centre coordinates are: 33° 30' 35.48"S; 18° 54' 39.04"E

Services

No new water will be abstracted so a WULA will not have to be conducted for the taking of water but for the storing but for other activities that trigger section 21 (b); (c) & (i) of the National Water Act.

As stated above, due to the downstream increase of the dam wall, associated dam infrastructure such as the existing pumphouse including compost storage facility, outlet pipe and Eskom electrical infrastructure will have to be relocated. The dam enlargement will inundate the existing access road around the existing dam and therefore a new access road around the dam footprint is proposed.

Environmental Legal Requirements

The National Environmental Management Act (NEMA, Act 107 of 1998), as amended, makes provision for the identification and assessment of activities that are potentially detrimental to the environment and which require authorisation from the competent authority based on the findings of an Environmental Assessment. NEMA is a national act, which is enforced by the Department of Environmental Affairs (DEA). In the Western Cape, these powers are delegated to the Department of Environmental Affairs & Development Planning (DEA&DP). Section A(d) of this document, lists all the activities that were identified as "triggered" by the proposed activity. It also discusses activities that "might" be triggered, in terms of the 2014 EIA (Environmental Impact Assessment) Regulations as amended.

Significant Environmental Aspects:

Biodiversity:
From the Biodiversity Overlay Maps from Cape Farm Mapper (**Appendix D**) and the Botanical Assessment conducted by the Biodiversity Specialist (**Appendix G1**) the site falls within a small Critical Biodiversity Area (CBA). However, the small CBA is located within the dam. The dam will also further impact Ecological Support Area Class 2 (ESA2).

According to the Vegetation map from Cape Farm Mapper, Appendix D, the vegetation that would have been present on the site is Swartland Shale Renosterveld. This type of vegetation is classified as *Critically Endangered* in terms of the *National Environmental Management: Biodiversity Act 2004, National List of Ecosystems that are threatened and in need of protection (NEMBA).*

However, The Botanical assessment concludes that the proposed dam enlargement will not impact on any remaining vegetation or plant species of significant conservation value. Most of the terrain and its immediate surroundings are considered heavily degraded to transformed, only a few indigenous species and alien pioneer species remains

Freshwater:
The Freshwater Reports, Appendix G2 states that the existing Zwartfontein dam is located in one of many sub-catchments along the Berg River. Please see figure 5 above. The sub-catchment is considered to be only 3,8km long, 2,3m wide and 663 hectares of which 130ha are above the farm dam to form the catchment area of the dam up to the hill..

According to the Freshwater Report, Appendix G2, the non-perennial stream which the Zwartfontein dam intersects, as indicated on the Water Resources Map from Cape Farm Mapper, Figure 3 above and Appendix D, is considered a drainage line as indicted in figure 5 above and figure 7 – 10 above. The drainage line is approx. 4,4k long. The drainage line upstream of the dam takes the shape of wide valleys with no discernible drainage line and with the same vegetation as elsewhere on the hill. The drainage line down-stream of the dam has been transformed into a straight agricultural return flow furrow, all the way down to its confluence with the Berg River. The drainage line is considered to be overgrown with reeds. The freshwater report concludes that the proposed enlargement of the Zwartfontein dam will not have any significant impact on the drainage line and Berg River

Heritage resources:
The Heritage screener conducted by CTS Heritage (Appendix G3.1) concluded that no structurers with heritage significance will be impacted by the proposed enlargement of the dam. In terms of archaeological, while it may be likely that, due to its proximity to the Berg River, that archaeological resources may be located within the proposed development area, it is unlikely that these resources will be in situ due to the extensive agricultural activity that has occurred on this site. Furthermore, no impacts to significant palaeontological resources are anticipated. HWC provided comment (Appendix E2) stating that the proposed dam enlargement will not impact on heritage resources.

Please refer to **Appendix G** for the Specialist reports.

Considering all the information, it is not envisaged that the proposed dam expansion pose any significant negative impact on the environment, while it is likely to result in a positive socio-economical outcome.

It is therefore recommended that this application be authorised with the necessary conditions of approval as described throughout this BAR.

SECTION A: PROJECT INFORMATION

1. ACTIVITY LOCATION

Location of all proposed sites:	Portion 8 & RE of Farm Zwartfontein No. 792
Farm / Erf name(s) and number(s) (including Portions thereof) for each proposed site:	Portion 8 & RE of Farm Zwartfontein No. 792
Property size(s) in m^2 for each proposed site:	Portion 8 of Farm Zwartfontein No. 792: 255.85ha RE of Farm Zwartfontein No. 792: 96.13ha
Development footprint size(s) in m^2:	±14.4ha (of which ±6ha is existing)
Surveyor General (SG) 21 digit code for each proposed site:	C04600000000079200000 C04600000000079200008

2. PROJECT DESCRIPTION

(a) Is the project a new development? If "NO", explain:

YES	NO

The project is for the proposed enlargement of the existing Zwartfontein dam on Portion 8 and RE of the Farm Zwartfontein No 792, Wellington of which an existing water use license is in place.

(b) Provide a detailed description of the scope of the proposed development (project).

Black Orchid Farming proposed the enlargement of the existing Zwartfontein dam on Portion 8 & RE of the Farm Zwartfontein No. 792, Wellington of which an existing water use license is in place. The proposed enlargement of the dam will provide insurance of supply for irrigation of the existing irrigation areas. The recent drought in the Western Cape and uncertainties of the impact of Climate change are the major drivers of this project.

The Applicant, Black Orchid Farming (Pty) Ltd. owns Zwartfontein Farms, which are managed by the UFF Agri Asset Management Trust. Black Orchid Farming (Pty) Ltd owns the following Zarfontein Farm Properties:

- Portion 7 Farm 792
- RE of Farm 789
- Portion 8 Farm 792

Existing Water Use Rights and WULA:

According to the Engineers Technical Report from Ingerop, Appendix K, the Berg River Irrigation Board confirmed tha the properties, as listed above, have a total enlisted area of 258.5ha for water uses on the properties listed under Zwartfontein Farm, owned by Black Orchid Farming (Pty) Ltd. According to the report, the proposed enlarged storage of Zwartfontein farm properties (915 000m^3) amounts to approximately 59% of the owners existing water rights.

The Water Use License Application will include the following:

- Section 21 (b) – storing of water with a volume of 765 000m^3

Section 21 (c) & (i) – impeding or diverting/altering the bed, banks of watercourse for all associated infrastructure of the propped development, as described below.

The proposed dam will be filled with water from the Berg River for the irrigation of fruit orchards (table grapes and citrus). the dam will be filled from an exiting abstraction point with existing water use rights enlisted under the Berg River Irrigation Board. The existing abstraction point (as shown in Figure 1 below) will remain as is.

Proposed development:

According to the Engineers Technical Report from Ingerop, Appendix K, the enlargement of the existing Zwartfontein dam will include the following developments:

1. **Enlargement of Zwartfontein Dam (Design Option 10 - Alternative A)**

- Enlargement of the existing Zwartfontein dam from a storage capacity of 150 000m³ with an existing wall height of 11.9m to a total storage capacity of 915 000m³ with a 22.5m wall. This gives an increase in capacity of 765 000m³ and an increase in wall height of 10.6m
  Existing dam footprint is currently at ±3.8ha (3800m²) and will be increased to ±11ha.
  The footprint of the new slipway and footprint of the new pumphouse (discussed below) will give a total footprint of ±14ha (140 000m²) of which 3,8ha (3800m²) is existing/ transformed. A new disturbance footprint of approximately 10,2 ha (102 0000m²) is expected.

  Various design options were investigated. The downstream raising of the dam wall, Option 10 (Alternative A) was considered the Preferred Alternative design. This will allow the client to keep the exiting dam in operations while construction is in progress as well as avoid unnecessary sediment removal on the upstream side of the dam. Design Alternatives are discussed in more detail in Section E of the report.

Due to the downstream increase of the dam wall, associated dam infrastructure such as the existing pumphouse including compost storage facility, outlet pipe and Eskom electrical infrastructure will have to be relocated. The dam enlargement will inundate the existing access road around the existing dam and therefore a new access road around the dam footprint is proposed.

1. **Relocation of Pumphouse**

- The exiting pumphouse is made out of two sections: (see figure 1 below). The pump station comprising of pumps, filters and compost pumps as well as compost tanks stored in a bunded area. Please refer to Figure 1 below for the existing facility.

- With the dam enlargement and raising of the dam wall it is proposed that the pumphouse and compost storage facility be split in two section.
  - It is proposed than the pump station containing pumps and filters be relocated approximately 65m SW downstream of the raised edam wall on the northern bank of the drainage line/stream. The footprint of the pumphouse will be ± 200m² on the bank the drainage line/stream.
  - It is further proposed that the compost storage facility be constructed next to the house in the property (Alternative A – preferred).
    This storage facility will store up to maximum 80 000L or 80m³ of compost and comprise off a cement slab with walls with no roof to contain any possible spills. The storage facility must comply to National Norms and Standards for the storage of Waste in terms of the National Environmental Management: Waste Act (Act No. 59 of 2008). The compost storage facility next to the house will have footprint of approximately 100m²
  - The pump station and compost tanks to be connected with an approximately 40mmØ, 100m pipeline.
  - An alternative location (Alternative B) was considered for the compost storage facility but is not preferred and is discussed in section E of the report.

2. **Replacement and extension of outlet pipeline**

- Replacement and extension of the existing outlet pipeline is proposed. The current pipeline has a 300mm Ø and is ±100m long up until the currently pumphouse. The existing pipeline as a throughput of approximately 100 l/second.
  It is proposed that the pipeline be replaced with a new pipeline of 500mm Ø. The total pipeline length is expected to be 265mamd will connect to the relocated pumphouse.

3. Relocation of Eskom Infrastructure

- Relocation of the existing Eskom electrical infrastructure, located directly below the existing dam embankment to downstream of the raised embankment footprint.

4. Relocation of irrigation pipelines

- Relocation and extension of irrigation pipelines. Pipeline Ø will vary from 110mm to 250 mm and will be ± 1150m in length.
  Pipelines to fall within ploughed land.

5. Construction of access road

- The existing access roads around the existing dam footprint will be inundated by the dam enlargement. It is therefore proposed that a 10m wide and 1600m long road be constructed along the dam footprint.

Please refer to the Figures below, Locality Maps, Appendix A and Design drawings, Appendix B.

Figure 1: Existing pumphouse and compost containers in compost storage facility to be relocated

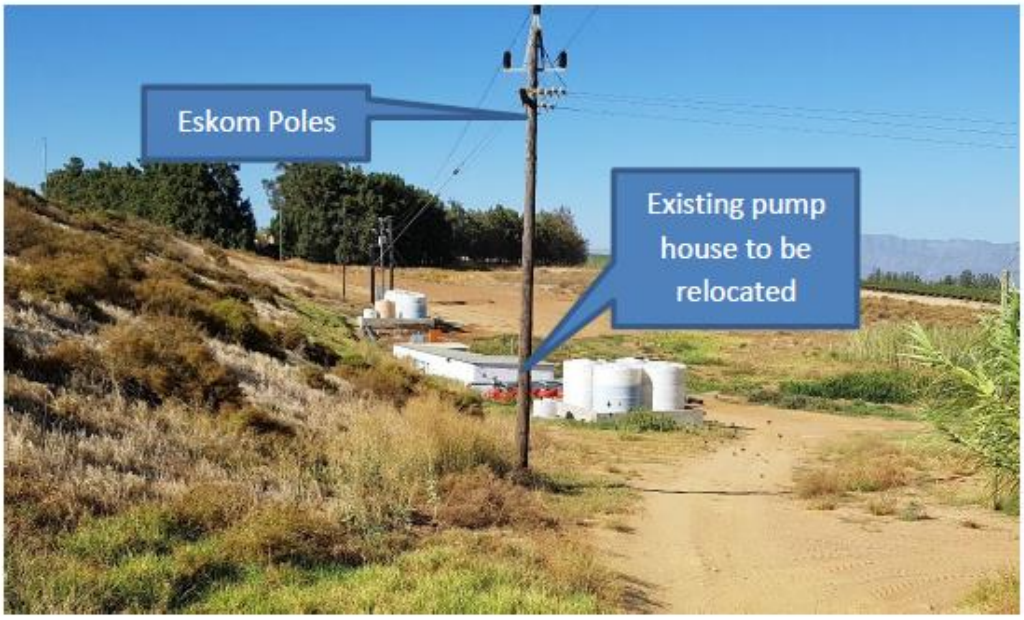

Figure 2: Existing Eskom Poles and existing pumphouse to be relocated, Engineers Technical Report, 2019

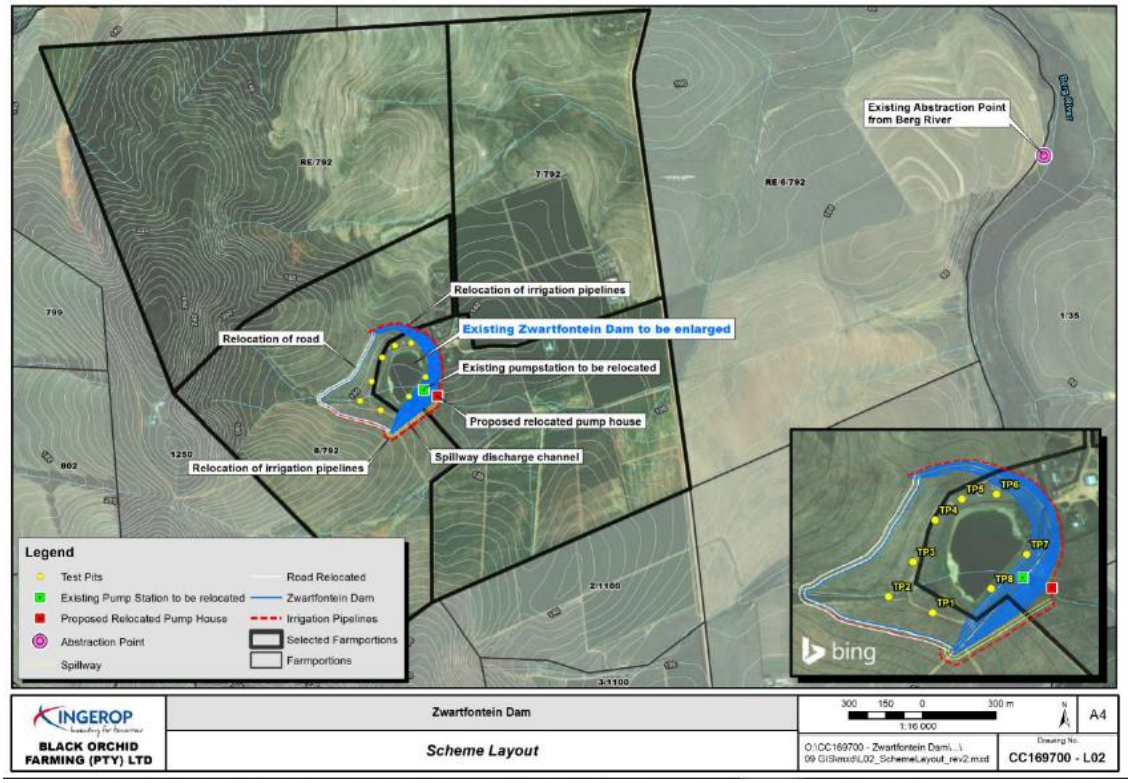

Figure 3:Site plan, Engineers Technical Report indicating the proposed and preferred relocation of dam infrastructure, Ingerop, 2019

Environmental Considerations:

According to the Vegetation map from Cape Farm Mapper, Appendix D, the vegetation that would have been present on the site is Swartland Shale Renosterveld. This type of vegetation is classified as *Critically Endangered* in terms of the *National Environmental Management: Biodiversity Act 2004, National List of Ecosystems that are threatened and in need of protection (NEMBA).* However, the site is considered mostly disturbed with no natural vegetation remaining due the existing dam on site and surrounding agricultural activities.

According to the Biodiversity Overlay Map from Cape Farm Mapper, Appendix D, the existing Zwartfontein dam partially falls within a Critical Biodiversity Area, Category 1, Terrestrial (CBA1). These are areas that are in a natural condition that are required to meet biodiversity targets. The objective is to keep these areas natural or near natural. The area, however, is no longer in a natural or near natural condition due to the existing Zwartfontein dam and surrounding agricultural activities. The existing dam and dam expansion falls/will fall within an Ecological Support Area, Category 2 (ESA2). These areas are not essential for meeting biodiversity targets and pay a role in supporting the functioning of Protected Areas and CBAs.

According to the Freshwater Resources Map from Cape Farm Mapper, Appendix D, the existing dam and dam expansion intersects/will intersect a non-perennial stream.

Specialist finds will be discussed later in the report.

Please note: This description must relate to the listed and specified activities in paragraph (d) below.

(c) Please indicate the following periods that are recommended for inclusion in the environmental authorisation:

(i)	the period within which commencement must occur,	Upon granting of the EA and WUL construction must occur within 2 years. To be confirmed.
(ii)	the period for which the environmental authorisation should be granted and the date by which the activity must have been concluded, where the environmental authorisation does not include operational aspects;	Construction of phase 1 is expected to take a period of 6 months. The EA should be granted for the maximum of 5 years. To be confirmed.
(iii)	the period that should be granted for the non-operational aspects of the environmental authorisation; and	N/A
(iv)	the period that should be granted for the operational aspects of the environmental authorisation.	N/A

Please note: The Department must specify the abovementioned periods, where applicable, in an environmental authorisation. In terms of the period within which commencement must occur, the period must not exceed 10 years and must not be extended beyond such 10 year period, unless the process to amend the environmental authorisation contemplated in regulation 32 is followed.

(d) List all the listed activities triggered and being applied for.

Please note: The onus is on the applicant to ensure that all the applicable listed activities are applied for and assessed as part of the EIA process. Please refer to paragraph (b) above.

EIA Regulations Listing Notices 1 and 3 of 2014 (as amended):

Listed Activity No(s):	Describe the relevant Basic Assessment Activity(ies) in writing as per Listing Notice 1 (GN No. R. 983)	Describe the portion of the development that relates to the applicable listed activity as per the project description.	Identify if the activity is development / development and operational / decommissioning / expansion / expansion and operational.
12	The development of infrastructure or structures with as physical footprint of 100m2 or more (a) within a watercourse ; (c) if not development setback exists, within 32m of a watercourse,	With the proposed dam expansion will, associated infrastructure will have to be relocated. The relocation of the pumphouse is proposed on the bank of the drainage line and	Development

	measured form the edge of the watercourse	will have a footprint of approx. 100m2.	
19	The moving of more than 10 m^3 of material within a watercourse.	The proposed dam is classified as an "in stream dam" and intersect a drainage line. The proposed earthmoving activities will exceed 10m^3.	Expansion
27	The clearance of an area of 1 ha or more, but less than 20 ha or more of indigenous vegetation	The proposed activity will enable the clearance of approximately 5h ha of disturbed vegetation	Expansion
48	The expansion of dams or weirs, where the dam or weir, including infrastructure and water surface area, is expanded by 100m^2 or more (a) within a watercourse	The proposed dam is classified as an "in stream dam" and intersect a drainage line,, expansion will be more than 100m^2 within a watercourse	Expansion
Listed Activity No(s):	Describe the relevant Basic Assessment Activity(ies) in writing as per Listing Notice 3 (GN No. R. 985)	Describe the portion of the development that relates to the applicable listed activity as per the project description.	Identify if the activity is development / development and operational / decommissioning / expansion / expansion and operational.
4	The development of a road winder than 4 meters with a reserve less than 13,5m (i) Western Cape (ii) Areas outside urban areas	It is proposed than a 10m wide, 1600m long access road be development around the dam footprint	Development
50	The expansion of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, where the combined capacity will be increased by 50 000m^3 or more	The proposed dam is located within a non-perennial stream, material will be excavated and used to increase the dam wall height. The dam capacity will be increased by 765 000m^3 m^3	

Waste management activities in terms of the NEM: WA (GN No. 921):

Category A Listed Activity No(s):	Describe the relevant Category A waste management activity in writing as per GN No. 921	Describe the portion of the development that relates to the applicable listed activity as per the project description
	N/A	

Note: If any waste management activities are applicable, the **Listed Waste Management Activities Additional Information Annexure** must be completed and attached to this Basic Assessment Report as **Appendix I.**

Atmospheric emission activities in terms of the NEM: AQA (GN No. 893):

Listed Activity No(s):	Describe the relevant atmospheric emission activity in writing as per GN No. 893	Describe the portion of the development that relates to the applicable listed activity as per the project description.
	N/A	

(e) Provide details of all components (including associated structures and infrastructure) of the proposed development and attach diagrams (*e.g.,* architectural drawings or perspectives, engineering drawings, process flowcharts, *etc*.).

Buildings Provide brief description below:	YES	NO

No buildings required.

Infrastructure (*e.g.,* roads, power and water supply/ storage) Provide brief description below:	YES	NO

Black Orchid (Pty) Ltd. is proposing the enlargement of the existing Zwartfontein dam on Portion 8 & RE of the Farm Zwartfontein No. 792, Wellington. Enlargement of the existing Zwartfontein dam from a storage capacity of 150 000m³ with an existing wall height of 11.9m to a total storage capacity of 915 000m³ with a 22.5m wall.

1. Water supply:

- The proposed dam will be filled with water from the Berg River, from an existing abstraction point with existing water use rights enlisted under the Berg River Irrigation Board. The existing abstraction point (as shown in Figure 1 below) will remain as is.

- The Water Use License Application will include the following:

  - Section 21 (b) – storing of water with a volume of 765 000m³
  - Section 21 (c) & (i) – impeding or diverting/altering the bed, banks of watercourse for all associated infrastructure of the propped development, as described below.

2. Relocation of Pumphouse

- The exiting pumphouse is made out of two sections: (see figure 1 below). The pump station comprising of pumps, filters and compost pumps as well as compost tanks stored in a bunded area. Please refer to Figure 1 below for the existing facility.

- With the dam enlargement and raising of the dam wall it is proposed that the pumphouse and compost storage facility be split in two section.
  - It is proposed than the pump station containing pumps and filters be relocated approximately 65m SW downstream of the raised edam wall on the northern bank of the drainage line/stream. The footprint of the pumphouse will be ± 200m² on the bank the drainage line/stream.
  - It is further proposed that the compost storage facility be constructed next to the house in the property (Alternative A – preferred).
    This storage facility will store up to maximum 80 000L or 80m³ of compost and comprise off a cement slab with walls with no roof to contain any possible spills. The storage facility must comply to National Norms and Standards for the storage of Waste in terms of the National Environmental Management: Waste Act (Act No. 59 of 2008). The compost storage facility next to the house will have footprint of approximately 100m²
  - The pump station and compost tanks to be connected with an approximately 40mmØ, 100m pipeline.
  - An alternative location (Alternative B) was considered for the compost storage facility but is not preferred and is discussed in section E of the report.

3. Replacement and extension of outlet pipeline

- Replacement and extension of the existing outlet pipeline is proposed. The current pipeline has a 300mm Ø and is ±100m long up until the currently pumphouse. The existing pipeline as a throughput of approximately 100 l/second.
  It is proposed that the pipeline be replaced with a new pipeline of 500mm Ø. The total pipeline length is expected to be 265mamd will connect to the relocated pumphouse.

4. Relocation of Eskom Infrastructure

- Relocation of the existing Eskom electrical infrastructure, located directly below the existing dam embankment to downstream of the raised embankment footprint.

5. Relocation of irrigation pipelines

- Relocation and extension of irrigation pipelines. Pipeline Ø will vary from 110mm to 250 mm and will be ± 1150m in length.

Pipelines to fall within ploughed land.

6. **Construction of access road**
   The existing access roads around the existing dam footprint will be inundated by the dam enlargement. It is therefore proposed that a 10m wide and 1600m long road be constructed along the dam footprint.

Processing activities (*e.g.,* manufacturing, storage, distribution) Provide brief description below:	YES	NO
N/A		

Storage facilities for raw materials and products (*e.g.,* volume and substances to be stored) Provide brief description below:	YES	NO
N/A		

Storage and treatment facilities for effluent, wastewater or sewage: Provide brief description below:	YES	NO
No treatment of effluent, waste water or sewage. No permanent toilets on site. Once construction starts, a portable chemical toilet should be made available on site. The toilet should not be placed within 32m of a watercourse/ river and should be serviced in a legal manner and removed after construction is completed.		

Storage and treatment of solid waste Provide brief description below:	YES	NO
No storage or treatment of solid waste. Solid waste produced during construction should be disposed of in a legal manner.		

Facilities associated with the release of emissions or pollution. Provide brief description below:	YES	NO
The activity is not expected to produce emissions or cause pollution.		

Other activities (*e.g.,* water abstraction activities, crop planting activities) – Provide brief description below:	YES	NO

Black Orchid Farming proposed the enlargement of the existing Zwartfontein dam on Portion 8 & RE of the Farm Zwartfontein No. 792, Wellington of which an existing water use license is in place. The proposed enlargement of the dam will provide insurance of supply for irrigation of the existing irrigation areas. The recent drought in the Western Cape and uncertainties of the impact of Climate change are the major drivers of this project.

According to the Engineers Technical Report from Ingerop, Appendix K, the Berg River Irrigation Board confirmed that the properties, as listed above, have a total enlisted area of 258.5ha for water uses on the properties listed under Zwartfontein Farm, owned by Black Orchid Farming (Pty) Ltd. According to the report, the proposed enlarged storage of Zwartfontein farm properties (915 000m³) amounts to approximately 59% of the owners existing water rights.

The Water Use License Application will include the following:

- Section 21 (b) – storing of water with a volume of 765 000m³
- Section 21 (c) & (i) – impeding or diverting/altering the bed, banks of watercourse for all associated infrastructure of the propped development, as described below.

The proposed dam will be filled with water from the Berg River, from an existing abstraction point with existing water use rights enlisted under the Berg River Irrigation Board. The existing abstraction point (as shown in Figure 1 below) will remain as is. The water will be used for the irrigation of existing crops which consist of table grapes and citrus orchards.

3. PHYSICAL SIZE OF THE PROPOSED DEVELOPMENT

(a) Property size(s): Indicate the size of all the properties (cadastral units) on which the development proposal is to be undertaken	255.85ha (255850000m²) 96.13ha (961300m²)	m²
(b) Size of the facility: Indicate the size of the facility where the development proposal is to be undertaken	N/A	m²
(c) Development footprint: Indicate the area that will be physically altered as a result of undertaking any development proposal (*i.e.,* the physical size of the development together with all its associated structures and infrastructure)	14ha (of which 3.8ha is Area to be physically altered : 10.2ha	m²
(d) Size of the activity: Indicate the physical size (footprint) of the development proposal	14ha (140 000m²)	m²
(e) For linear development proposals: Indicate the length (L) and width (W) of the development proposal Irrigation pipelines will be extended and connect with existing irrigation infrastructure Layout plans to be provided. Replacement and extension of outlet pipe	(L) 1150m	m
	(W) 110- 120mm	m
	(L) 265m	
	(w) 500mm	
(f) For storage facilities: Indicate the volume of the storage facility Compost storage facility next to the house (Alternative A – preferred).	80	m³
(g) For sewage/effluent treatment facilities: Indicate the volume of the facility (Note: the maximum design capacity must be indicated	N/A	m³

4. SITE ACCESS

	YES	NO
(a) Is there an existing access road?		
(b) If no, what is the distance in (m) over which a new access road will be built?		16000m

(c) Describe the type of access road planned:

An access roads to the site exists, however with the dam enlarging the existing access roads will be inundated and there a gravel road is proposed, 10m wide and 1600m long along the dam footprint.

Please refer to Appendix A and B.

Please note: The position of the proposed access road must be indicated on the site plan.

5. DESCRIPTION OF THE PROPERTY(IES) ON WHICH THE LISTED ACTIVITY(IES) ARE TO BE UNDERTAKEN AND THE LOCATION OF THE LISTED ACTIVITY(IES) ON THE PROPERTY

5.1 Provide a description of the property on which the listed activity(ies) is/are to be undertaken and the location of the listed activity(ies) on the property, as well as of all alternative properties and locations (duplicate section below as required).

Position 8 and RE of Farm Zwartfontein No. 792 ia located in the Swartland, about halfway between Wellington and Malmesbury and almost halfway between the R45 (Malmesbury Road) and the R44. The two properties are approximately 351.98 ha in size. The existing Zwartfontein dam is located on the Southern Portion of RE of Farm Zwartfontein No. 792, which can be considered as fully developed. The northern portion of RE of Farm Zwartfontein No. 792 still support a large area of natural vegetation in a good condition.

No alternative properties and locations were investigated as this application is for the expansion of the existing Zwartfontein dam.

The Botanical Assessment conducted, Appendix G1, states that according to Google Images, small areas surrounding the existing dam appears to support natural vegetation. However, according to the site visit conducted, the remaining vegetation around the dam can be described as transformed, with very few indigenous vegetation remaining. The botanical specialist states that the topsoil has been disturbed with the construction of the existing dam. the dam site had been transformed as a result of intensive agriculture practices over a long period of time and the only species remaining consist of a few hardy shrub and weedy pioneer species.

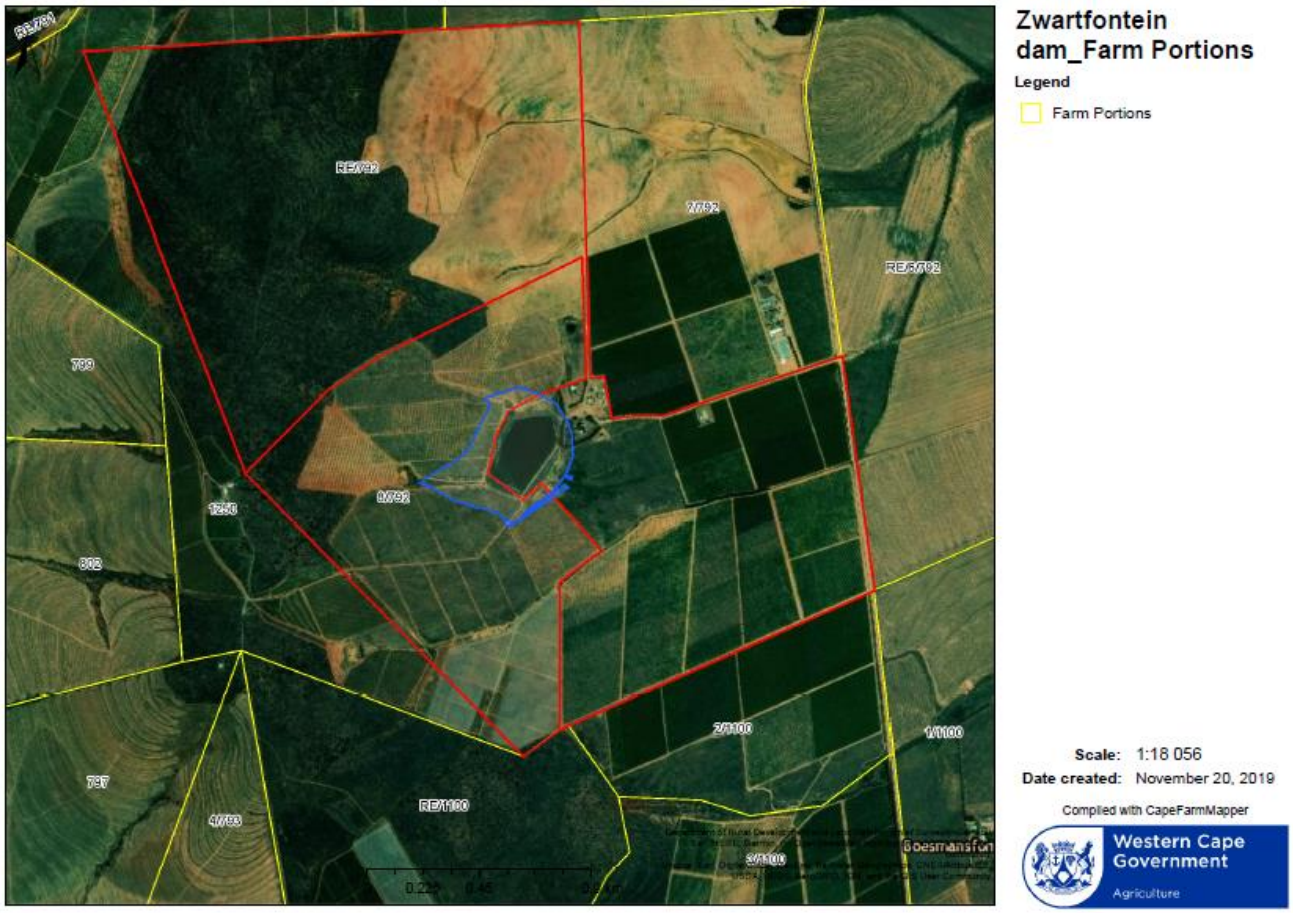

Figure 4: Farm portions map from Cape Farm Mapper, indicating the existing Zwartfontein dam as well as the proposed expansion on the relevant farm portions

Coordinates of all the proposed activities on the property or properties (sites): (Centre point)	**Latitude (S):** (deg.; min.; sec)			**Longitude (E):** (deg.; min.; sec.)		
	33°	**30 ´**	**35.48"**	**18º**	**54‘**	**39.04“**
	°	‘	“	º	‘	“
	°	‘	“	º	‘	“
	°	‘	“	º	‘	“

Note: For land where the property has not been defined, the coordinates of the area within which the development is proposed must be provided in an addendum to this report.

5.2 Provide a description of the area where the **aquatic** or ocean-based activity(ies) is/are to be undertaken and the location of the activity(ies) and alternative sites (if applicable).

According to the Freshwater Resources Map from Cape Farm Mapper, Appendix D and the figure below, the exiting dam and dam expansion intersects/will intersect a non-perennial stream.

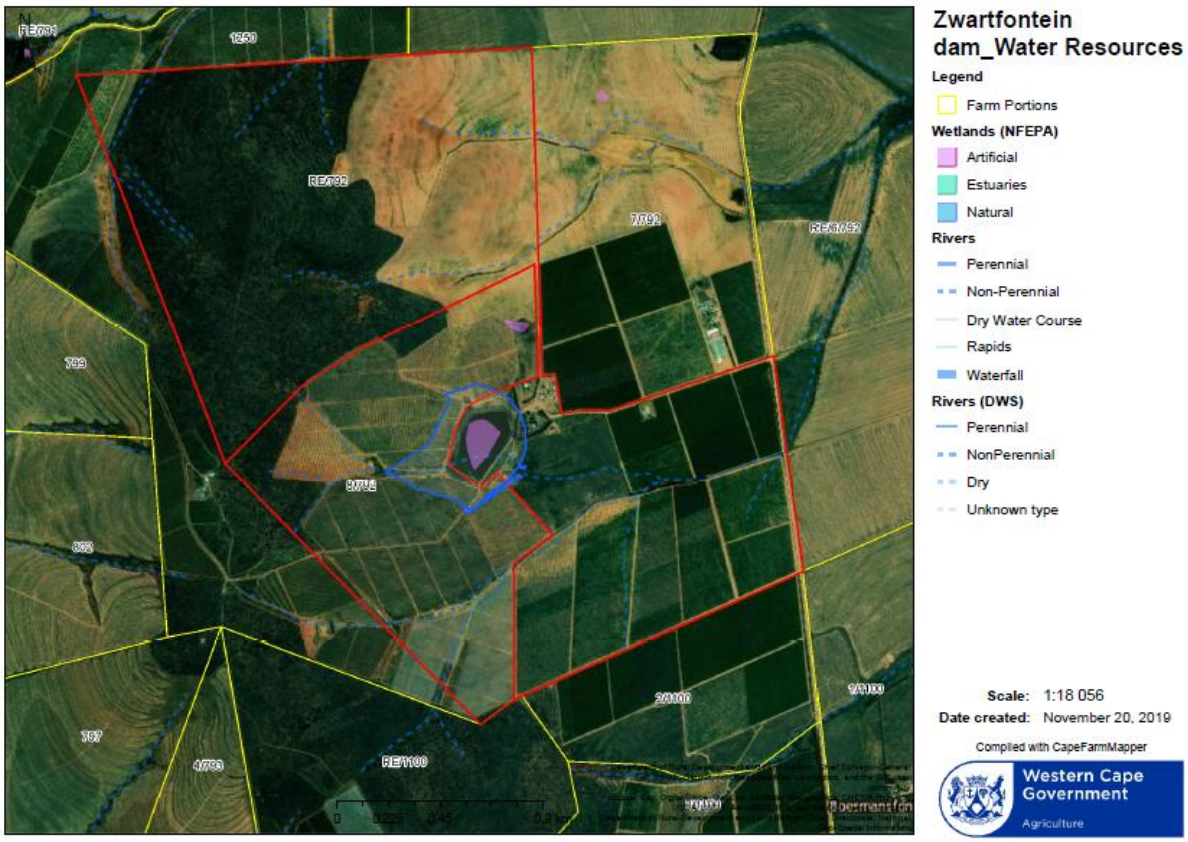

Figure 5: Water resources map from Cape Farm Mapper indicating the existing dam as well as the dam expansion intersecting a non-perennial stream

According to the Freshwater Report, Appendix G2, the Berg River separates Zwartfontein Farms from the Elandskloof mountains. The landscape is considered a rolling, undulation of low hills, interrupted by the Cape Fold Mountains (Figure 6 below).

Figure 6: Zwartfontein location. Freshwater Report 2019

The Freshwater Reports, Appendix G2 states that the existing Zwartfontein dam is located in one of many sub-catchments along the Berg River. Please see figure 5 below. The sub-catchment is considered to be only 3,8km long, 2,3m wide and 663 hectares of which 130ha are above the farm dam to form the catchment area of the dam up to the hill. The highest point of the catchment is on a hill, the lowest point is at its point of discharge in the Berg River. The slope is rather steep which gives rise to fast moving water during high rainfall events and high erosion potential.

According to the Freshwater Report, Appendix G2, the non-perennial stream which the Zwartfontein dam intersects, as indicated on the Water Resources Map from Cape Farm Mapper as indicated in Figure 3 above and Appendix D, is considered a drainage line, figure 7 blow. The drainage line is approx. 4,4k long. The drainage line upstream of the dam takes the shape of wide valleys with no discernible drainage line and with the same vegetation as elsewhere on the hill. The drainage line down stream of the dam has been transformed into a straight agricultural return flow furrow, all the way down to its confluence with the Berg River. The drainage line is considered to be overgrown with reeds. The freshwater report concludes that the proposed enlargement of the Zwartfontein dam will not have any significant impact on the drainage line and Berg River.

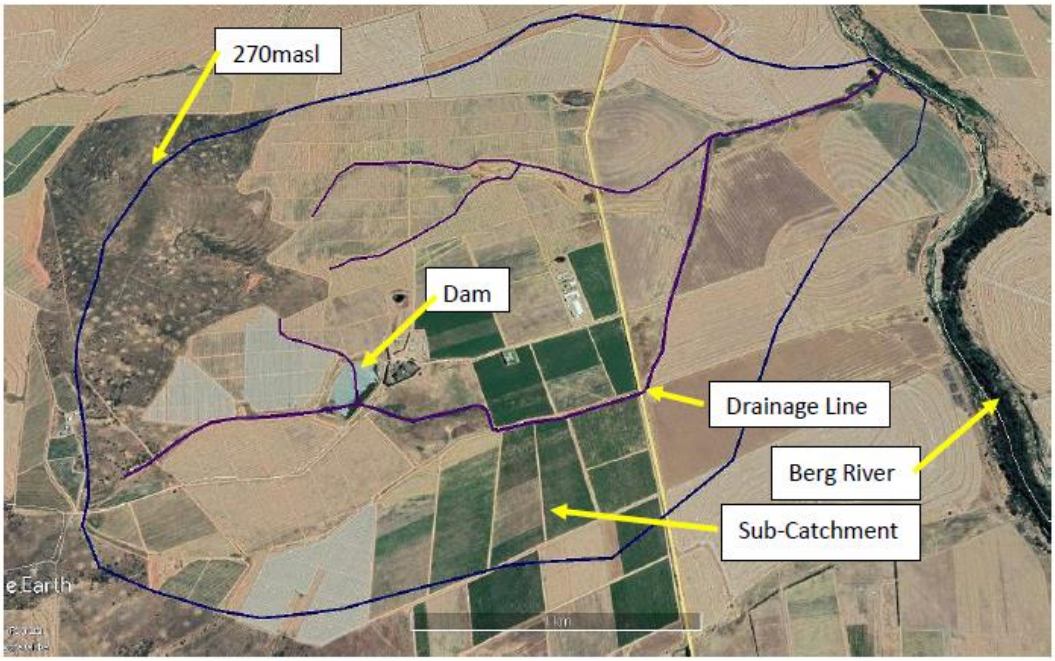

Figure 7: Sub-catchment and drainage line, Freshwater report 2019

No alternative properties and locations were investigated as this application is for the expansion of the existing Zwartfontein dam.

The proposed dam will be filled with water from the Berg River, from an existing abstraction point with existing water use rights enlisted under the Berg River Irrigation Board. The existing abstraction point will remain as is and therefore the enlargement of the dam will not impact on the Berg river.

Freshwater Specialist findings are discussed in more details in **Section B** of this report.

	Latitude (S): (deg.; min.; sec)			**Longitude (E):** (deg.; min.; sec)		
Coordinates of the boundary /perimeter of all proposed aquatic or ocean-based activities (sites) (if applicable):	°	'	"	°	'	"
	°	'	"	°	'	"
	°	'	"	°	'	"
	°	'	"	°	'	"

5.3 For a linear development proposal, please provide a description and coordinates of the corridor in which the proposed development will be undertaken (if applicable).

For linear activities:	**Latitude (S):** (deg.; min.; sec)			**Longitude (E):** (deg.; min.; sec)		
• Starting point of the activity	°	'	"	°	'	"
• Middle point of the activity	°	'	"	°	'	"
• End point of the activity	°	'	"	°	'	"

Note: For linear development proposals longer than 1000m, please provide an addendum with co-ordinates taken every 250m along the route. All important waypoints must be indicated and the GIS shape file provided digitally.

5.4 Provide a location map (see below) as **Appendix A** to this report that shows the location of the proposed development and associated structures and infrastructure on the property; as well as a detailed site development plan / site map (see below) as **Appendix B** to this report; and if applicable, all alternative properties and locations. The GIS shape files (.shp) for maps / site development plans must be included in the electronic copy of the report submitted to the competent authority.

Locality Map: **Appendix A**	The scale of the locality map must be at least 1:50 000. For linear development proposals of more than 25 kilometres, a smaller scale *e.g.*, 1:250 000 can be used. The scale must be indicated on the map. The map must indicate the following: • an accurate indication of the project site position as well as the positions of the alternative sites, if any; • road names or numbers of all the major roads as well as the roads that provide access to the site(s) • a north arrow; • a legend; • a linear scale; • the prevailing wind direction (during November to April and during May to October); and • GPS co-ordinates (to indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection). For an ocean-based or aquatic activity, the coordinates must be provided within which the activity is to be undertaken and a map at an appropriate scale clearly indicating the area within which the activity is to be undertaken. Coordinates must be provided in degrees, minutes and seconds using the Hartebeesthoek94; WGS84 co-ordinate system.

Site Plan: **Appendix B**	Detailed site development plan(s) must be prepared for each alternative site or alternative activity. The site plans must contain or conform to the following: • The detailed site plan must preferably be at a scale of 1:500 or at an appropriate scale. The scale must be indicated on the plan, preferably together with a linear scale. • The property boundaries and numbers of all the properties within 50m of the site must be indicated on the site plan. • The current land use (not zoning) as well as the land use zoning of each of the adjoining properties must be indicated on the site plan. • The position of each element of the application as well as any other structures on the site must be indicated on the site plan. • Services, including electricity supply cables (indicate aboveground or underground), water supply pipelines, boreholes, sewage pipelines, storm water infrastructure and access roads that will form part of the development must be indicated on the site plan. • Servitudes and an indication of the purpose of each servitude must be indicated on the site plan. • Sensitive environmental elements within 100m of the site must be included on the site plan, including (but not limited to): o Watercourses / Rivers / Wetlands - including the 32 meter set back line from the edge of the bank of a river/stream/wetland; o Flood lines (*i.e.,* 1:100 year, 1:50 year and 1:10 year where applicable; o Ridges; o Cultural and historical features; o Areas with indigenous vegetation (even if degraded or infested with alien species). • Whenever the slope of the site exceeds 1:10, a contour map of the site must be submitted. • North arrow A map/site plan must also be provided at an appropriate scale, which superimposes the proposed development and its associated structures and infrastructure on the environmental sensitivities of the preferred and alternative sites indicating any areas that should be avoided, including buffer areas. The GIS shape file for the site development plan(s) must be submitted digitally

6. SITE PHOTOGRAPHS

Colour photographs of the site and its surroundings (taken on the site and taken from outside the site) with a description of each photograph. The vantage points from which the photographs were taken must be indicated on the site plan, or locality plan as applicable. If available, please also provide a recent aerial photograph. Photographs must be attached as **Appendix C** to this report. The aerial photograph(s) should be supplemented with additional photographs of relevant features on the site. Date of photographs must be included. Please note that the above requirements must be duplicated for all alternative sites.

SECTION B: DESCRIPTION OF THE RECEIVING ENVIRONMENT

Site/Area Description

For linear development proposals (pipelines, *etc*.) as well as development proposals that cover very large sites, it may be necessary to complete copies of this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section B and indicate the area that is covered by each copy on the Site Plan.

1. GRADIENT OF THE SITE

Indicate the general gradient of the sites (highlight the appropriate box).

Flat	Flatter than 1:10	1:10 – 1:4	Steeper than 1:4

2. LOCATION IN LANDSCAPE

(a) Indicate the landform(s) that best describes the site (highlight the appropriate box(es).

Ridgeline	Plateau	Side slope of hill / mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front

(b) Provide a description of the location in the landscape.

According to specialist reports Appendix G, the study area lies in the Swartland which consist of a broad rural expanse of low rolling hills intermingled with farms, small communities and towns. Before intense agricultural practices, the Swartland was characterised by "Renosterveld" vegetation which gave the area a dark grey olive viewed from afar - hence the name Swartland (black country). The Berg River separates Zwartfontein Farms from the Elandskloof mountains. The landscape is considered a rolling, undulation of low hills, interrupted by the Cape Fold Mountains (Figure 7 above).

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

(a) Is the site(s) located on or near any of the following (highlight the appropriate boxes)?

Shallow water table (less than 1.5m deep)	~~YES~~	~~NO~~	UNSURE
Seasonally wet soils (often close to water bodies)	YES	~~NO~~	~~UNSURE~~
Unstable rocky slopes or steep slopes with loose soil	~~YES~~	NO	~~UNSURE~~
Dispersive soils (soils that dissolve in water)	~~YES~~	NO	~~UNSURE~~
Soils with high clay content	YES	~~NO~~	~~UNSURE~~
Any other unstable soil or geological feature	~~YES~~	NO	~~UNSURE~~
An area sensitive to erosion	YES	~~NO~~	~~UNSURE~~
An area adjacent to or above an aquifer.	~~YES~~	NO	~~UNSURE~~
An area within 100m of a source of surface water	~~YES~~	NO	~~UNSURE~~
An area within 500m of a wetland	YES	~~NO~~	~~UNSURE~~
An area within the 1:50 year flood zone	YES	~~NO~~	~~UNSURE~~
A water source subject to tidal influence	~~YES~~	NO	~~UNSURE~~

(b) If any of the answers to the above is "YES" or "UNSURE", specialist input may be requested by the Department. (Information in respect of the above will often be available at the planning sections of local authorities. The 1:50 000 scale Regional Geotechnical Maps prepared by Geological Survey may also be used).

(c) Indicate the type of geological formation underlying the site.

~~Granite~~	Shale	~~Sandstone~~	Quartzite	~~Dolomite~~	~~Dolorite~~	~~Other (describe)~~

Provide a description.

The following information was taken from the Heritage Screener, Appendix G3.

The underlying geology which consists of schists and shales of the Malmesbury Group is considered to be good agricultural land, the shale being rich in trace elements, which before the advent of agriculture supported large quantities of game. The Berg River alluvial terraces contain copious quantities of Early and Middle Stone Age artefacts attesting to the occupation of this landscape by humans for a million years or more. Today the Swartland is one of the most important wheat producing areas of the nation. Almost every farmer is involved in the cultivation of wheat which has given the entire area its particular character and texture." The area under investigation is currently cultivated and has been under cultivation since the late 19th Century at least. As such, the proposed dam expansion is consistent with the existing agricultural cultural landscape of the Swartland.

The area proposed for development is underlain by the Porterville Formation and Quarternary sands, both with low palaeontological sensitivity.. The Porterville Formation forms part of the Malmesbury Group. No fossils have yet been recorded from this group but there is a potential for organic-walled microfossils, trace fossils, stromatolites, even vendobiontans and shelly fossils like Cloudina . However, the resource to be accessed by the sand mine is the Quarternary sands.

The Heritage screener conducted by CTS Heritage (Appendix G3.1) concluded that no structurers with heritage significance will be impacted by the proposed enlargement of the dam. In terms of archaeological, while it may be likely that, due to its proximity to the Berg River, that archaeological resources may be located within the proposed development area, it is unlikely that these resources will be in situ due to the extensive agricultural activity that has occurred on this site. Furthermore, no impacts to significant palaeontological resources are anticipated. HWC provided comment (Appendix E2) stating that the proposed dam enlargement will not impact on heritage resources.

Figure 8: Hills above the dam, Freshwater report 2019

4. SURFACE WATER

(a) Indicate the surface water present on and or adjacent to the site and alternative sites (highlight the appropriate boxes)?

Perennial River	~~YES~~	NO	~~UNSURE~~
Non-Perennial River	YES	~~NO~~	~~UNSURE~~
Permanent Wetland	~~YES~~	NO	~~UNSURE~~
Seasonal Wetland	~~YES~~	NO	~~UNSURE~~
Artificial Wetland	YES	~~NO~~	~~UNSURE~~
Estuarine / Lagoon	~~YES~~	NO	~~UNSURE~~

(b) Provide a description.

The Freshwater Reports, Appendix G2 states that the existing Zwartfontein dam is located in one of many sub-catchments along the Berg River. Please see figure 7 above. The sub-catchment is considered to be only 3,8km long, 2,3m wide and 663 hectares of which 130ha are above the farm dam to form the catchment area of the dam up to the hill..

According to the Freshwater Report, Appendix G2, the non-perennial stream which the Zwartfontein dam intersects, as indicated on the Water Resources Map from Cape Farm Mapper, Figure 3 above and Appendix D, is considered a drainage line as indicted in figure 7 above and figure 9 – 12 below. The drainage line is approx. 4,4k long. The drainage line upstream of the dam takes the shape of wide valleys with no discernible drainage line and with the same vegetation as elsewhere on the hill. The drainage line down-stream of the dam has been transformed into a straight agricultural return flow furrow, all the way down to its confluence with the Berg River. The drainage line is considered to be overgrown with reeds. The freshwater report concludes that the proposed enlargement of the Zwartfontein dam will not have any significant impact on the drainage line and Berg River.

The proposed dam will be filled with water from the Berg River, from an existing abstraction point with existing water use rights enlisted under the Berg River Irrigation Board. The existing abstraction point will remain as is and therefore the enlargement of the dam will not impact on the Berg river.

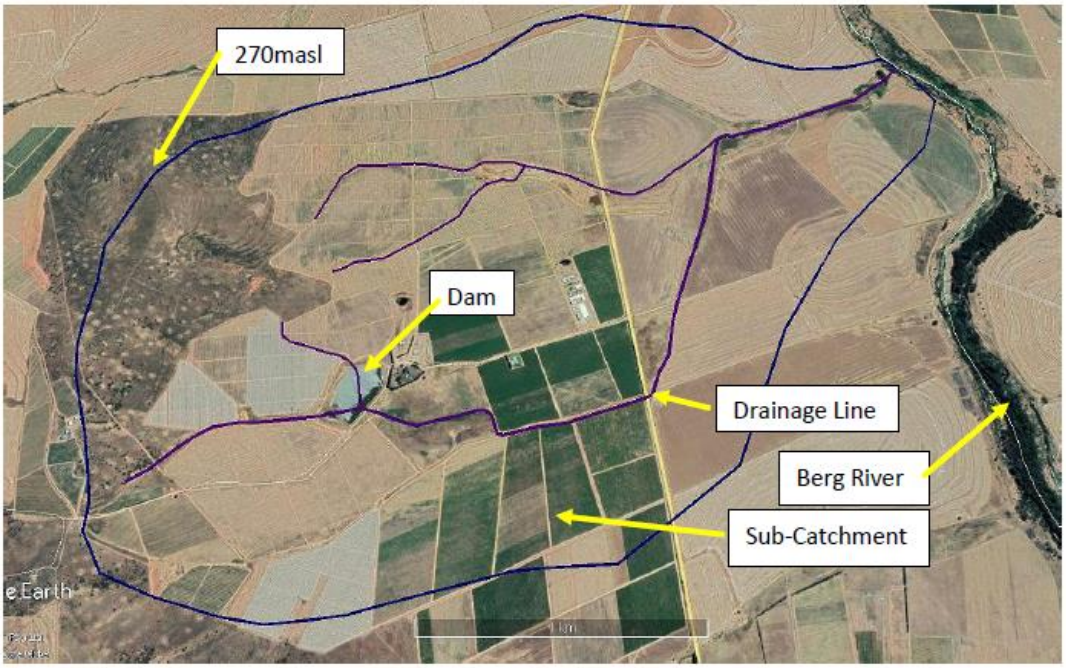

Figure 9: Sub-catchment and drainage line, Freshwater report 2019

Figure 10: Drainage line below dam wall (and existing pumphouse & compost facility and Eskom infrastructure to be relocated), Freshwater report 2019

Figure 11: Drainage line in vineyards, Freshwater report 2019

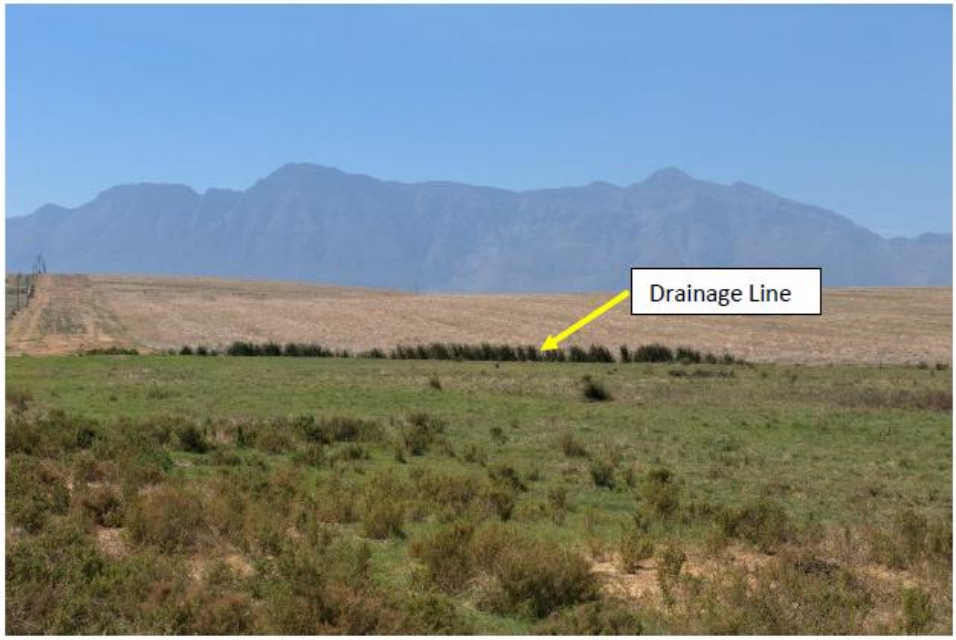

Figure 12: Diagonal drainage line, Freshwater report 2019

5. THE SEAFRONT / SEA

(a) Is the site(s) located within any of the following areas? (highlight the appropriate boxes).
If the site or alternative site is closer than 100m to such an area, please provide the approximate distance in (m).

AREA	YES	NO	UNSURE	If "YES": Distance to nearest area (m)
An area within 100m of the high water mark of the sea	~~YES~~	NO	~~UNSURE~~	
An area within 100m of the high water mark of an estuary/lagoon	~~YES~~	NO	~~UNSURE~~	
An area within the littoral active zone	~~YES~~	NO	~~UNSURE~~	
An area in the coastal public property	~~YES~~	NO	~~UNSURE~~	
Major anthropogenic structures	~~YES~~	NO	~~UNSURE~~	
An area within a Coastal Protection Zone	~~YES~~	NO	~~UNSURE~~	
An area seaward of the coastal management line	~~YES~~	NO	~~UNSURE~~	
An area within the high risk zone (20 years)	~~YES~~	NO	~~UNSURE~~	
An area within the medium risk zone (50 years)	~~YES~~	NO	~~UNSURE~~	
An area within the low risk zone (100 years)	~~YES~~	NO	~~UNSURE~~	
An area below the 5m contour	~~YES~~	NO	~~UNSURE~~	
An area within 1km from the high water mark of the sea	~~YES~~	NO	~~UNSURE~~	
A rocky beach	~~YES~~	NO	~~UNSURE~~	
A sandy beach	~~YES~~	NO	~~UNSURE~~	

(b) If any of the answers to the above is "YES" or "UNSURE", specialist input may be requested by the Department. (The 1:50 000 scale Regional Geotechnical Maps prepared by Geological Survey may also be used).

6. BIODIVERSITY

Note: The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed development. To assist with the identification of the biodiversity occurring on site and the ecosystem status, consult http://bgis.sanbi.org or BGIShelp@sanbi.org . Information is also available on compact disc ("cd") from the Biodiversity-GIS Unit, Tel.: (021) 799 8698. This information may be updated from time to time and it is the applicant/ EAP's responsibility to ensure that the latest version is used. A map of the relevant biodiversity information (including an indication of the habitat conditions as per (b) below) must be provided as an overlay map on the property/site plan as **Appendix D** to this report.

(a) Highlight the applicable biodiversity planning categories of all areas on preferred and alternative sites and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category. Also describe the prevailing level of protection of the Critical Biodiversity Area ("CBA") and Ecological Support Area ("ESA") (how many hectares / what percentages are formally protected).

Systematic Biodiversity Planning Category	~~CBA~~	ESA	~~Other Natural Area ("ONA")~~	No Natural Area Remaining ("NNR")
If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan and the conservation management objectives	From the Biodiversity Overlay Maps from Cape Farm Mapper (**Appendix D**) and the Botanical Assessment conducted by the Biodiversity Specialist (**Appendix G1**) the site falls within a small Critical Biodiversity Area (CBA). However, the small CBA is located within the dam. the dam will also further impact Ecological Support Area Class 2 (ESA2). ESA2 areas are not essential for meeting biodiversity targets, but paly a role in supporting the functioning of CBAs, and are often vital for delivering ecosystems services. The objective is to restore and/ or manage to minimize impact on ecological processes and ecological infrastructure functioning, especially soil and water-related services and to allow for faunal movement.			
Describe the site's CBA/ESA quantitative values (hectares/percentage) in relation to the prevailing level of protection of CBA and ESA (how many hectares / what percentages are formally protected locally and in the province)	The biodiversity specialist states that special care was taken when these areas was studies in order to check for ant special vegetation features in these areas. The Botanical assessment concludes that the proposed dam enlargement will not impact on any remaining vegetation or plant species of significant conservation value. Most of the terrain and its immediate surroundings are considered heavily degraded to transformed, only a few indigenous species remains. Thus 0% ESA left.			

(b) Highlight and describe the habitat condition on site.

Habitat Condition	**Percentage of habitat condition class (adding up to 100%) and area of each in square metre (m^2)**		**Description and additional comments and observations (including additional insight into condition, *e.g.* poor land management practises, presence of quarries, grazing/harvesting regimes, *etc.*)**
Natural	0%	m^2	
Near Natural (includes areas with low to moderate level of alien invasive plants)	0%	m^2	
Degraded (includes areas heavily invaded by alien plants)	15 %	5 500 m^2	The Botanical assessment concludes that the proposed dam enlargement will not impact on any remaining vegetation or plant species of significant conservation value. Most of the terrain and its

			immediate surroundings are considered heavily degraded to transformed, only a few indigenous species remains.
Transformed (includes cultivation, dams, urban, plantation, roads, *etc*.)	95%	104 500 m^2	The Botanical assessment concludes that the proposed dam enlargement will not impact on any remaining vegetation or plant species of significant conservation value. Most of the terrain and its immediate surroundings are considered heavily degraded to transformed, only a few indigenous species remains.

(c) Complete the table to indicate:
(i) the type of vegetation present on the site, including its ecosystem status; and
(ii) whether an aquatic ecosystem is present on/or adjacent to the site.

Terrestrial Ecosystems		**Description of Ecosystem, Vegetation Type, Original Extent, Threshold (ha, %), Ecosystem Status**
Ecosystem threat status as per the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	Critically	According to the Vegetation map from Cape Farm Mapper, Appendix D, the vegetation that would have been present on the site is Swartland Shale Renosterveld. This type of vegetation is classified as *Critically Endangered* in terms of the *National Environmental Management: Biodiversity Act 2004, National List of Ecosystems that are threatened and in need of protection (NEMBA).* However, The Botanical assessment concludes that the proposed dam enlargement will not impact on any remaining vegetation or plant species of significant conservation value. Most of the terrain and its immediate surroundings are considered heavily degraded to transformed, only a few indigenous species and alien pioneer species remains. 0% Critically Endangered, Swartland Shale Renosterveld, remaining .
	Endangered	
	Vulnerable	
	Least Threatened	

Aquatic Ecosystems						
Wetland (including rivers, depressions, channelled and unchannelled wetlands, flats, seeps pans, and artificial wetlands)			Estuary		Coastline	
YES	NO	UNSURE	YES	NO	YES	NO

(d) Provide a description of the vegetation type and/or aquatic ecosystem present on the site, including any important biodiversity features/information identified on the site (e.g. threatened species and special habitats). Clearly describe the biodiversity targets and management objectives in this regard.

From the Biodiversity Overlay Maps from Cape Farm Mapper (**Appendix D**) and the Botanical Assessment conducted by the Biodiversity Specialist (**Appendix G1**) the site falls within a small Critical Biodiversity Area (CBA). However, the small CBA is located within the dam. the dam will also further impact Ecological Support Area Class 2 (ESA2).

According to the Vegetation map from Cape Farm Mapper, Appendix D, the vegetation that would have been present on the site is Swartland Shale Renosterveld. This type of vegetation is classified as *Critically Endangered* in terms of the *National Environmental Management: Biodiversity Act 2004, National List of Ecosystems that are threatened and in need of protection (NEMBA).*

However, The Botanical assessment concludes that the proposed dam enlargement will not impact on any remaining vegetation or plant species of significant conservation value. Most of the terrain and its immediate surroundings are considered heavily degraded to transformed, only a few indigenous species and alien pioneer species remains

According to the Botanical assessment, Appendix G1, all of the remaining natural vegetaion surrounding the current dam site is vegetation dominated by weeds and a few hardy shrubs. Apart from the grasses like (Briza minor, *Bromus diandrus, Cynodon dactylon, Eragrostis* species and sedges like *Kallinga* species, *Phragmites australis, Typha capensis* most of this area was characterized by alien problem plants like: *Amaranthus deflexus* (pigweed), *Achyranthes cf. aspera* (Bur weed), *Chenopodium album*, *Conyza bonariensis* (Skraalhans), *Datura stramonium* (Olieboom), *Echium plantagineum*, *Nicotiana glauca* (Tabaco plant), *Ricinus communis* (Kasterolieplant), *Salsola kali* (tumbleweed) and *Urtica urens* (nettle). Indigenous plants include the weedy *Galenia africana* (Kraalbos), *Eriocephalus africanus* (kapokbossie), one of the hardy *Hermannia* species, *Stoebe* species and the common *Tribulus terrestris* (Dubbeltjie). A few young individuals of the following alien and invasive trees were also observed namely *Acacia saligna* (Port Jackson Willow) and *Casuarina cunninghamiana* (Beefwood). No protected plant species were encountered.

The Freshwater Reports, Appendix G2 states that the existing Zwartfontein dam is located in one of many sub-catchments along the Berg River. Please see figure 5 below/ The sub-catchment is considered to be only 3,8km long, 2,3m wide and 663 hectares of which 130ha are above the farm dam to form the catchment area of the dam up to the hill. The highest point of the catchment is on a hill, the lowest point is at its point of discharge in the Berg River. The slope is rather steep which gives rise to fast moving water during high rainfall events and high erosion potential.

According to the Freshwater Report, Appendix G2, the non-perennial stream which the Zwartfontein dam intersects, as indicated on the Water Resources Map from Cape Farm Mapper (Appendix D) is considered a drainage line, Figure 7 above. The drainage line is approx. 4,4k long. The drainage line upstream of the dam takes the shape of wide valleys with no discernible drainage line and with the same vegetation as elsewhere on the hill. The drainage line down stream of the dam has been transformed into a straight agricultural return flow furrow, all the way down to its confluence with the Berg River. The drainage line is considered to be overgrown with reeds.

The proposed dam will be filled with water from the Berg River, from an existing abstraction point with existing water use rights enlisted under the Berg River Irrigation Board. The existing abstraction point will remain as is.

The Freshwater report further assesses the Present Ecological State (PES) and Ecological Importance (EI) and Ecological Sensitivity (ES) of the drainage line and the Berg River. The EI is based on the presence of especially fish species on a local, regional or national level. The ES is often described as the ability of aquatic habitat to assimilate impacts, or the potential of the aquatic habitat to ounce back to an ecological condition closer to the situation period to human impact. If it recovers, it is not regarded as sensitive.

Drainage line PES and EIS:

The drainage line has been classified as an “E” PES. This indicates that the drainage line has been significantly altered with a loss of ecological functioning. The proposed increase in the dam wall will not change this classification and the drainage line will not deteriorate any further.

In terms of the Ecological Importance of the drainage line, according to the freshwater report, the drainage line could not be considered as ecologically important. The drainage line is devoid of permanent water, apart from irrigation return flow. There are no fish or endangered plant or animal species in die drainage line.

The freshwater report states that the Zwartfontein drainage line, would never recover if agriculture was to cease and nature was to be left to its own devices. The report uses the ability for renosterveld to recover once removed as a well-known practical example, when the vegetation is removed for the purpose of agriculture and then left to recover, the natural vegetation does not grow back. Cultivated areas all over the area and that have been left alone for 50 or even 100 years, have not recovered. Likewise, it can be expected that the Zwartfontein drainage line would not recover. In this sense it can be considered as sensitive.

Berg river PES and EIS:

The Berg river was classified as a "C" PES. It has a list/ It has lost some ecological functioning because of water quality and invasive organisms both instream, and in the riparian zone. The score is better than the "D" score downstream, where the river is heavily overgrown with Eucalypts. According to the report, the better score can be attributes to the lack of return flow at the end if the dry season, later summer. The score was elevated by the removal of alien invasive vegetation removal campaign. Carp dominated instream habitat.

The Berg river qualifies as Ecologically Important due to the potential presence of two species on the Red Data List. These include Red fin minnows (*Pseudibarbus burgeri)* and white fish (*Barbus andrewi*), as listed by the IUCN as endangered. Capa galaxuias and Red fin minnows can be expected in the upper reaches of the watershed rather than at Zwartfontein. White fish (*Barbus andrewi*), could have been present some time ago and could have been decimated by the introduction of exotic and predarory small mouth black bass (*Micropterus dolomieu*) and trout. The Zwartfontein habitat has been taken over by carp (*Cyrinus carpio*)

According to the freshwater report, the Berg River at Zwartfontein has absorbed numerous and deep-cutting human impacts, yet is still functions as an aquatic ecosystem. In the highly improbable event of ceased human impact, the river here would probably bounce back to its previous glory. In this respect the river cannot be categorised as sensitive. It was pleasing to note the recovery of the riparian zone during the site visit. It still has a very long way to go if it were to resemble anything like the original vegetation. This would probably not happen for many decades and in this respect the riparian zone can be described as sensitive.

The freshwater report concludes that the existing legal water use is already fully utilised for irrigation and has already been discounted by the DWS against ecological flow requirements of the Berg river, and the proposed extra storage capacity would not alter the situation. However, with large irrigation schemes there is always the possibility of more agricultural return flow which impact the river system. However, the drainage lines have already been transformed into stormwater management systems and return flows and the enlargement of the dam will not add to these impacts

Farm dams are often regarded as habitat for aquatic organisms. However, water levels vary widely, from full when filled during winter to empty at the end of summer. This makes for an aggressive aquatic environment with limited ecological functioning. With such a large turn-over of water in the dam water quality problems are less of a problem.

Mitigation measures are proposed and discussed later in the report.

7. LAND USE OF THE SITE

Note: The Department may request specialist input/studies depending on the nature of the land use character of the area and potential impact(s) of the proposed development.

Untransformed area	Low density residential	Medium density residential	High density residential	Informal residential
Retail	Commercial & warehousing	Light industrial	Medium industrial	Heavy industrial
Power station	Office/consulting room	Military or police base/station/compound	Casino/entertainment complex	Tourism and Hospitality facility
Open cast mine	Underground mine	Spoil heap or slimes dam	Quarry, sand or borrow pit	Dam or reservoir
Hospital/medical centre	School	Tertiary education facility	Church	Old age home
Sewage treatment plant	Train station or shunting yard	Railway line	Major road (4 lanes and more)	Airport
Harbour	Sport facilities	Golf course	Polo fields	Filling station
Landfill or waste treatment site	Plantation	Agriculture	River, stream or wetland	Nature conservation area
Mountain, koppie or ridge	Museum	Historical building	Graveyard	Archaeological site
Other land uses (describe):				

(a) Provide a description.

According to specialist reports Appendix G, the study area lies in the Swartland which consist of a broad rural expanse of low rolling hills intermingled with farms, small communities and towns. Before intense agricultural practices, the Swartland was characterised by “Renosterveld” vegetation which gave the area a dark grey olive viewed from afar - hence the name Swartland (black country).

The Berg River separates Zwartfontein Farms from the Elandskloof mountains. The landscape is considered a rolling, undulation of low hills, interrupted by the Cape Fold Mountains (Figure 4 above).

The Freshwater Reports, Appendix G2 states that the existing Zwartfontein dam is located in one of many sub-catchments along the Berg River. Please see figure 5 above. The sub-catchment is considered to be only 3,8km long, 2,3m wide and 663 hectares of which 130ha are above the farm dam to form the catchment area of the dam up to the hill..

According to the Freshwater Report, Appendix G2, the non-perennial stream which the Zwartfontein dam intersects, as indicated on the Water Resources Map from Cape Farm Mapper, Appendix D, is considered a drainage line as indicted in figure 7 above and figure 9 – 12 above. The drainage line is approx. 4,4k long. The drainage line upstream of the dam takes the shape of wide valleys with no discernible drainage line and with the same vegetation as elsewhere on the hill. The drainage line down-stream of the dam has been transformed into a straight agricultural return flow furrow, all the way down to its confluence with the Berg River. The drainage line is considered to be overgrown with reeds. The freshwater report concludes that the proposed enlargement of the Zwartfontein dam will not have any significant impact on the drainage line and Berg River

8. LAND USE CHARACTER OF THE SURROUNDING AREA

(a) Highlight the current land uses and/or prominent features that occur within +/- 500m radius of the site and neighbouring properties if these are located beyond 500m of the site.

Note: The Department may request specialist input/studies depending on the nature of the land use character of the area and potential impact(s) of the proposed development.

Untransformed area	Low density residential	Medium density residential	High density residential	Informal residential
Retail	Commercial & warehousing	Light industrial	Medium industrial	Heavy industrial
Power station	Office/consulting room	Military or police base/station/compound	Casino/entertainment complex	Tourism and Hospitality facility
Open cast mine	Underground mine	Spoil heap or slimes dam	Quarry, sand or borrow pit	Dam or reservoir
Hospital/medical centre	School	Tertiary education facility	Church	Old age home
Sewage treatment plant	Train station or shunting yard	Railway line	Major road (4 lanes and more)	Airport
Harbour	Sport facilities	Golf course	Polo fields	Filling station
Landfill or waste treatment site	Plantation	Agriculture	River, stream or wetland	Nature conservation area
Mountain, koppie or ridge	Museum	Historical building	Graveyard	Archaeological site
Other land uses (describe):				

(b) Provide a description, including the distance and direction to the nearest residential area, industrial area, agri-industrial area.

The Crop Census Map, **Figure** below shows that land uses surrounding the property is also dominated by agricultural activities, mainly fruit and wheat farming.

The Freshwater resources maps. Appendix D indicated non perennial streams.

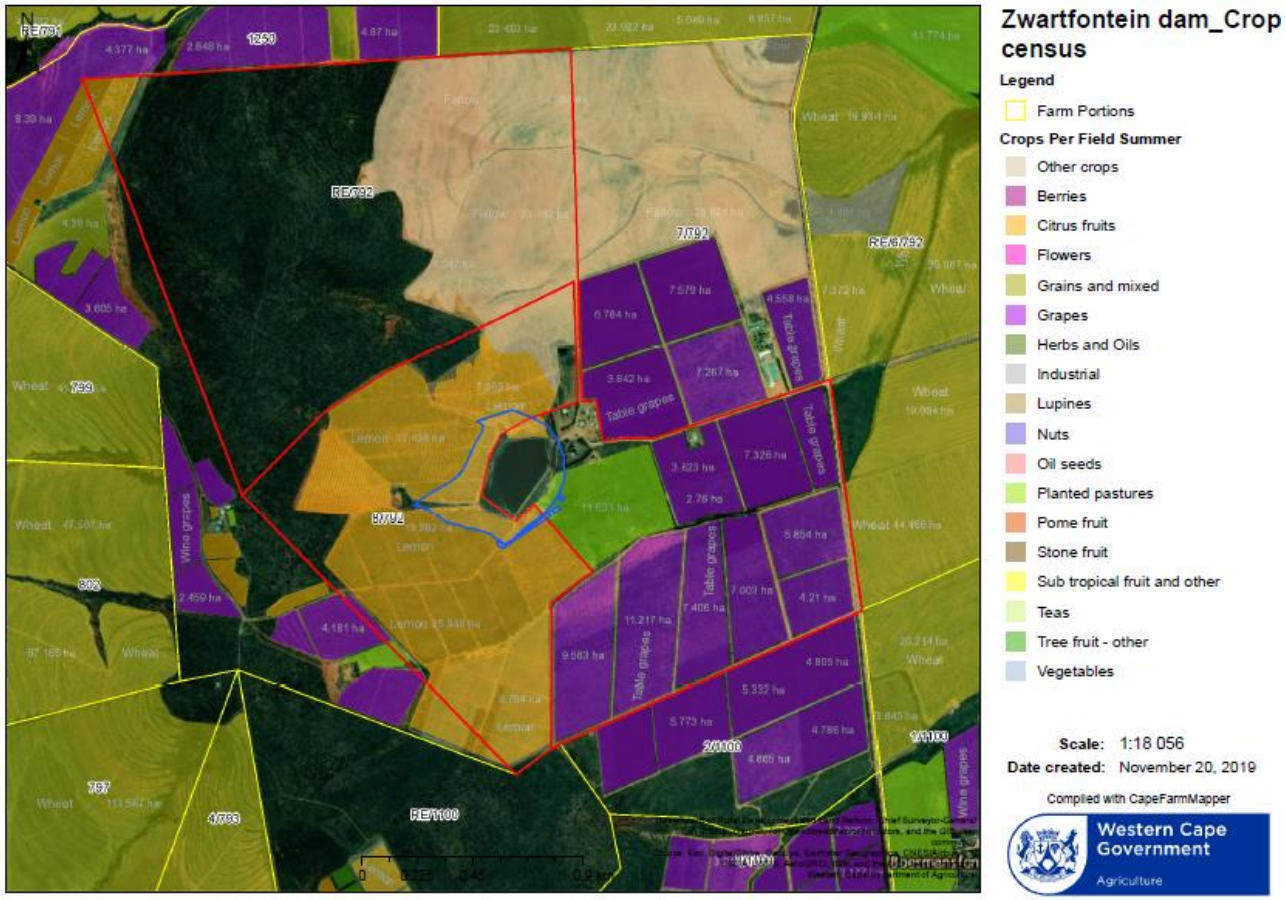

Figure 13: Crop census map, CapeFarm Mapper 2019

9. SOCIO-ECONOMIC ASPECTS

a) Describe the existing social and economic characteristics of the community in the vicinity of the proposed site, in order to provide baseline information (for example, population characteristics/demographics, level of education, the level of employment and unemployment in the area, available work force, seasonal migration patterns, major economic activities in the local municipality, gender aspects that might be of relevance to this project, *etc.*).

The following information was taken from the 2018 West Coast District Municipality Social Economic Profile (SEP).

According to the Department of Social Development's 2018 projections, the West Coast Municipality has a population of 450 610, placing it in the middle of other Districts, with the Garden Route and Cape Winelands being bigger, whilst Overberg and Central Karoo have smaller populations. This total is estimated to increase to 530 860 by 2024 which equates to 2.8 per cent average annual growth over this period

In terms of education, the grade 12 drop-out rate for learners within the West Coast District declined marginally from 28.8 per cent in 2015 to 28.4 per cent in 2016; decreasing further to 26.9 per cent in 2017. Within the West Coast District, the grade 12 drop-out rate was highest in Cederberg, at 37.9 per cent in 2015, declining to 33.0 per cent in 2017, while the lowest was for the Swartland municipal area, which increases slightly from 20.1 per cent in 2015 to 20.2 per cent in 2017. The Swartland rate was also the lowest in the Province. Drop-outs are influenced by a wide array of socioeconomic factors including unemployment, poverty and teenage pregnancies.

Over the last decade, the West Coast District's unemployment rate2 has been rising steadily; it increased from 9.0 per cent in 2015 to 10.1 per cent in 2016 and 11.1 per cent in 2017. The West Coast District's unemployment rate in 2017 is considerably below that of the Province's 18.2 per cent and is one of the lowest District's rates in the Province.

The local economy of the West Coast District municipal area is dominated by the manufacturing (R5 513.7 million or 20.3 per cent in 2016) followed by the agriculture, forestry and fishing sector (R5 482.3 million or 20.2 per cent), wholesale and retail trade, catering and accommodation sector (R4 169.8 million or 15.3 per cent), finance, insurance, real estate and business services (R3 093.7 million or 11.4 per cent) and general government (R2 839.2 million or 10.5 per cent). Combined, these top five sectors contributed R21.1 billion (or 77.7 per cent) to the West Coast District municipal economy, which was estimated be worth R27.2 billion in 2016.

The agriculture, forestry and fishing sector contributed the most jobs in the West Coast District municipal area in 2016 (69 711 or 39.3 per cent), followed by the wholesale and retail trade, catering and accommodation sector (28 433 or 16.0 per cent); community and social services (19 020 or 10.7 per cent); general government (17 432 or 9.8 per cent) and manufacturing (16 001 or 9.0 per cent). Combined, these top five sectors contributed 150 598 or 84.8 per cent of the 177 604 jobs in 2016.

10. HISTORICAL AND CULTURAL ASPECTS

(a) Please be advised that if section 38 of the NHRA is applicable to your proposed development, you are requested to furnish this Department with written comment from Heritage Western Cape as part of your public participation process. Heritage Western Cape must be given an opportunity, together with the rest of the I&APs, to comment on any Pre-application BAR, a Draft BAR, and Revised BAR.

Section 38 of the NHRA states the following:
"38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as-
(a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
(b) the construction of a bridge or similar structure exceeding 50m in length;
(c) any development or other activity which will change the character of a site-
(i) exceeding 5 000m² in extent; or
(ii) involving three or more existing erven or subdivisions thereof; or
(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
(d) the re-zoning of a site exceeding 10 000m² in extent; or
(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,
must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development".

(b) The impact on any national estate referred to in section 3(2), excluding the national estate contemplated in section 3(2)(i)(vi) and (vii), of the NHRA, must also be investigated, assessed and evaluated. Section 3(2) states the following:
"3(2) Without limiting the generality of subsection (1), the national estate may include—
(a) places, buildings, structures and equipment of cultural significance;
(b) places to which oral traditions are attached or which are associated with living heritage;
(c) historical settlements and townscapes;
(d) landscapes and natural features of cultural significance;
(e) geological sites of scientific or cultural importance;
(f) archaeological and palaeontological sites;
(g) graves and burial grounds, including—
(i) ancestral graves;
(ii) royal graves and graves of traditional leaders;
(iii) graves of victims of conflict;
(iv) graves of individuals designated by the Minister by notice in the Gazette;
(v) historical graves and cemeteries; and
(vi) other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
(h) sites of significance relating to the history of slavery in South Africa;
(i) movable objects, including—
(i) objects recovered from the soil or waters of South Africa, including archaeological and paleontological objects and material, meteorites and rare geological specimens;
(ii) objects to which oral traditions are attached or which are associated with living heritage;
(iii) ethnographic art and objects;
(iv) military objects;
(v) objects of decorative or fine art;
(vi) objects of scientific or technological interest; and
(vii) books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996)".

Is Section 38 of the NHRA applicable to the proposed development?	YES	~~NO~~	~~UNCERTAIN~~
If YES or UNCERTAIN, explain:	The proposed expansion of Zwartfontein dam will exceed 5000m² A NID (Appendix G3.2) was submitted to HWC and comments from HWC (Appendix E1) concluded that the proposed enlargement of the dam will not impact on Heritage Resources.		
Will the development impact on any national estate referred to in Section 3(2) of the NHRA?	~~YES~~	NO	~~UNCERTAIN~~
If YES or UNCERTAIN, explain:	No, comments from HWC (Appendix E1) concluded that the proposed enlargement of the dam will not impact on Heritage Resources.		

Will any building or structure older than 60 years be affected in any way?	~~YES~~	NO	~~UNCERTAIN~~
If YES or UNCERTAIN, explain:	No, there are no buildings in the vicinity that will be affected.		
Are there any signs of culturally or historically significant elements, as defined in section 2 of the NHRA, including Archaeological or paleontological sites, on or close (within 20m) to the site?	~~YES~~	NO	~~UNCERTAIN~~
If YES or UNCERTAIN, explain:	No, comments from HWC (Appendix E1) concluded that the proposed enlargement of the dam will not impact on Heritage Resources.		

Note: If uncertain, the Department may request that specialist input be provided **and** Heritage Western Cape must provide comment on this aspect of the proposal. (Please note that a copy of the comments obtained from the Heritage Resources Authority must be appended to this report as Appendix E1).

11. APPLICABLE LEGISLATION, POLICIES, CIRCULARS AND/OR GUIDELINES

(a) Identify all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to the development proposal and associated listed activity(ies) being applied for and that have been considered in the preparation of the BAR.

LEGISLATION, POLICIES, PLANS, GUIDELINES, SPATIAL TOOLS, MUNICIPAL DEVELOPMENT PLANNING FRAMEWORKS, AND INSTRUMENTS	**ADMINISTERING AUTHORITY and how it is relevant to this application**	**TYPE Permit/license/authorisation/comment / relevant consideration** (*e.g.* rezoning or consent use, building plan approval, Water Use License and/or General Authorisation, License in terms of the SAHRA and CARA, coastal discharge permit, *etc.*)	**DATE** (if already obtained)**:**
National Environmental Management Act, 1998 (Act No. 107 of 1998) – NEMA EIA Regulations 2014 (As amended)	Department of Environmental Affairs and Development Planning ("DEA&DP")	Environmental Authorisation	The Basic Assessment process (this report) is currently underway.
National Water Act, 1998 (Act No. 36 of 1998)	DWS	There is no need to apply for a new water use license for the *taking of water.* Proof to be proved. Francois Joubert from Schoeman en Vennote will initiate the EWULA for other activities that trigger section 21 of the National Water Act. These are the following: • *S21 (b) Storing of water* • *S21 (c) Impeding or diverting the flow of the water course* • *S21 (i) Altering the bed, bank, course or*	EWULA in process Please refer to email confirmation from DWS, Appendix E2.

		characteristic of a watercourse	
Dam safety regulations in terms of sections 117 to 123, chapter 12 of the National Water Act, 1998 (Act 36 of 1998).	DWS (Dam Safety Office)	Dam classification in terms of Dam safety regulations.	To be submitted
National Heritage Resources Act 1999 (Act 25 of 1999)	Heritage Western Cape	Notice of Intent to Develop (NID)	A NID was submitted to HWC. HWC gave comment that the proposed development will not impact on heritage resources. **Appendix E1.**

(b) Describe how the proposed development **complies with and responds** to the legislation and policy context, plans, guidelines, spatial tools, municipal development planning frameworks and instruments.

LEGISLATION, POLICIES, PLANS, GUIDELINES, SPATIAL TOOLS, MUNICIPAL DEVELOPMENT PLANNING FRAMEWORKS, AND INSTRUMENTS	**Describe how the proposed development complies with and responds:**
DEADP Guidelines	All guidelines were consulted and adhered to when undertaking this Basic Assessment Report.
National Environmental Management Act, 1998 (Act 107, 1998).	This application is being undertaken according to the National Environmental Management Act, 1998.
National Water Act (Act 36 of 1998)	There is no need to apply for a new water use license for the *taking of water.* Proof of existing water use to be provided; Francois Joubert from Schoeman en Vennote will initiate the EWULA for other activities that trigger section 21 of the National Water Act. These are the following: • *S21 (b) Storing of water* • *S21 (c) Impeding or diverting the flow of the water course* • *S21 (i) Altering the bed, bank, course or characteristic of a watercourse*
Dam safety regulations in terms of sections 117 to 123, chapter 12 of the National Water Act, 1998 (Act 36 of 1998).	To be submitted
National Heritage Resources Act (Act 25 of 1999)	A NID was submitted to HWC. HWC provided comments that no heritage resources will be impacted by the proposed enlargement (**Appendix E1**)

Note: Copies of any comments, permit(s) or licences received from any other Organ of State must be attached to this report as **Appendix E**.

Section C: PUBLIC PARTICIPATION

The PPP must fulfil the requirements outlined in the NEMA, the EIA Regulations, 2014 (as amended) and if applicable, the NEM: WA and/or the NEM: AQA. This Department's Circular EADP 0028/2014 (dated 9 December 2014) on the "One Environmental Management System" and the EIA Regulations, any subsequent Circulars, and guidelines must also be taken into account.

1. Please highlight the appropriate box to indicate whether the specific requirement was undertaken or whether there was an exemption applied for.

In terms of Regulation 41 of the EIA Regulations, 2014 (as amended) -			
(a) fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of -			
(i) the site where the activity to which the application relates, is or is to be undertaken; and	YES	~~EXEMPTION~~	
(ii) any alternative site	~~YES~~	~~EXEMPTION~~	N/A
(b) giving written notice, in any manner provided for in Section 47D of the NEMA, to –			
(i) the occupiers of the site and, if the applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;	YES	~~EXEMPTION~~	~~N/A~~
(ii) owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;	YES	~~EXEMPTION~~	
(iii) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;	YES	~~EXEMPTION~~	
(iv) the municipality (Local and District Municipality) which has jurisdiction in the area;	YES	~~EXEMPTION~~	
(v) any organ of state having jurisdiction in respect of any aspect of the activity; and	YES	~~EXEMPTION~~	
(vi) any other party as required by the Department;	YES	~~EXEMPTION~~	~~N/A~~
(c) placing an advertisement in -			
(i) one local newspaper; or	YES	~~EXEMPTION~~	
(ii) any official *Gazette* that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;	YES	~~EXEMPTION~~	~~N/A~~
(d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken	~~YES~~	~~EXEMPTION~~	N/A
(e) using reasonable alternative methods, as agreed to by the Department, in those instances where a person is desirous of but unable to participate in the process due to— (i) illiteracy; (ii) disability; or (iii) any other disadvantage.	~~YES~~	~~EXEMPTION~~	N/A
If you have indicated that "EXEMPTION" is applicable to any of the above, proof of the exemption decision must be appended to this report.			
Please note that for the NEM: WA and NEM: AQA, a notice must be placed in at least two newspapers circulating in the area where the activity applied for is proposed.			
If applicable, has/will an advertisement be placed in at least two newspapers?	YES	NO	
If "NO", then proof of the exemption decision must be appended to this report.			

2. Provide a list of all the State Departments and Organs of State that were consulted:

Please refer to Appendix F1 for the Comments & Response report and original comments received

State Department / Organ of State	Date request was sent:	Date comment received:	Support / not in support
Department of Environmental Affairs and Development Planning (DEA&DP)	27 March 2019 (Letter) 04 April 2019 (NOI)	09 April 2019 15 April 2019	Acknowledge
Swartland Local Municipality	27 March 2019	29 March 2019	Acknowledge
West Coast District Municipality	27 March 2019	-	No comments received yet
Ward Councillor Swartland Local Municipality	27 March 2019	-	No comments received yet

DWS	27 March 2019	-	No comments received yet
Cape Nature	27 March 2019	04 April 2019	Acknowledge
Heritage Western Cape	27 March 2019 (Letter 14 April 2019 (NID submission)	30 April 2019 (NID Response)	Support
Western Cape Department of Agriculture – Land use Management	27 March 2019	28 March 2019	Acknowledge
Bergrivier Irrigation Board	27 March 2019	-	No comments received yet

3. Provide a summary of the issues raised by I&APs and an indication of the manner in which the issues were incorporated, or the reasons for not including them.
   (The detailed outcomes of this process, including copies of the supporting documents and inputs must be included in a Comments and Response Report to be attached to the BAR (see note below) as **Appendix F**).

All comments and responses captured and addressed in the Comments and Response report, **Appendix F.1**. Please refer to Appendix F1.1 – F1.5 and E1 for original comments received.

4. Provide a summary of any conditional aspects identified / highlighted by any Organs of State, which have jurisdiction in respect of any aspect of the relevant activity.

Comments from HWC, Appendix E1:
Should any heritage resources, including evidence graves and human burials, archeologically material and paleontological material be discovered during the execution of the activities above, all works must be stopped immediately and HWC must be notified without delay.

Note:
Even if pre-application public participation is undertaken as allowed for by Regulation 40(3), it must be undertaken in accordance with the requirements set out in Regulations 3(3), 3(4), 3(8), 7(2), 7(5), 19, 40, 41, 42, 43 and 44.

If the "exemption" option is selected above and no proof of the exemption decision is attached to this BAR, the application will be refused.

A list of all the potential I&APs, including the Organs of State, notified and a list of all the registered I&APs must be submitted with the BAR. The list of registered I&APs must be opened, maintained and made available to any person requesting access to the register in writing.

The BAR must be submitted to the Department when being made available to I&APs, including the relevant Organs of State and State Departments which have jurisdiction with regard to any aspect of the activity, for a commenting period of at least 30 days. Unless agreement to the contrary has been reached between the Competent Authority and the EAP, the EAP will be responsible for the consultation with the relevant State Departments in terms of Section 24O and Regulation 7(2) – which consultation must happen simultaneously with the consultation with the I&APs and other Organs of State.

All the comments received from I&APs on the BAR must be recorded, responded to and included in the Comments and Responses Report included as **Appendix F** of the BAR. If necessary, any amendments made in response to comments received must be effected in the BAR itself. The Comments and Responses Report must also include a description of the PPP followed.

The minutes of any meetings held by the EAP with I&APs and other role players wherein the views of the participants are recorded, must also be submitted as part of the public participation information to be attached to the final BAR as **Appendix F.**

Proof of all the notices given as indicated, as well as notice to I&APs of the availability of the Pre-Application BAR (if applicable), Draft BAR, and Revised BAR (if applicable) must be submitted as part of the public participation information to be attached to the BAR as **Appendix F**. In terms of the required "proof" the following must be submitted to the Department:

- a site map showing where the site notice was displayed, a dated photographs showing the notice displayed on site and a copy of the text displayed on the notice;
- in terms of the written notices given, a copy of the written notice sent, as well as:
  - if registered mail was sent, a list of the registered mail sent (showing the registered mail number, the name of the person the mail was sent to, the address of the person and the date the registered mail was sent);
  - if normal mail was sent, a list of the mail sent (showing the name of the person the mail was sent to, the address of the person, the date the mail was sent, and the signature of the post office worker or the post office stamp indicating that the letter was sent);
  - if a facsimile was sent, a copy of the facsimile report;
  - if an electronic mail was sent, a copy of the electronic mail sent; and
  - if a "mail drop" was done, a signed register of "mail drops" received (showing the name of the person the notice was handed to, the address of the person, the date, and the signature of the person); and
- a copy of the newspaper advertisement ("newspaper clipping") that was placed, indicating the name of the newspaper and date of publication (of such quality that the wording in the advertisement is legible).

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 F5.**

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.

Please refer to the table below which indicate the public participation process conducted this far

R41	Posters, Advertisement & Notification letters
(2) (a) (i)	Posters were displayed on the site property entrance and on the site as well as Du Vlei farmstall on R46; Die Rooi Spens, Hermon; Agrimark Wellington; Midway Superette, Wellington Posters were A2 and A3 Please see **Appendix F2 & F3**
(ii)	N/A No viable alternative site
(2) (b) (iii)	Notification letters were sent to the municipal ward councilor at the Swartland Local Municipality Please see **Appendix F4**
(iv)	Notification letters were sent to Swartland Local Municipality & West Coast District Municipality Please see **Appendix F4**
(v)	Notification letters were sent to the following organs of state: • Department of Environtal Affairs and Development Planning • DWS • Cape Nature • Heritage Western Cape • WC Department of Agriculture and Land Use Management Please see **Appendix F4**
(vi)	Notification letters were sent to neighbours Please see **Appendix F4**
(2) (c) (i)	An advert was placed in the Swartland Gazette 26 March 2019. Please see **Appendix F6**

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 see **Appendix F5**
R43	**Registered I&AP entitled to comments**
3	I&AP were given 30 days for comments during the initial public participation phase and will be giver 30 day to comment on the Pre-Application BAR (this report).
R44	**I&AP to be recorded**
	A summary of issues raised by I&AP are addressed in the comments and response report (C&RR). Please see **Appendix F1** for the C&RR and **F1.1 – F1.4** for the original comments received this far.

SECTION D: NEED AND DESIRABILITY

Note: Before completing this section, first consult this Department's Circular EADP 0028/2014 (dated 9 December 2014) on the "One Environmental Management System" and the EIA Regulations, 2014 (as amended), any subsequent Circulars, and guidelines available on the Department's website: **http://www.westerncape.gov.za/eadp**). In this regard, it must be noted that the *Guideline on Need and Desirability in terms of the Environmental Impact Assessment (EIA) Regulations, 2010* published by the national Department of Environmental Affairs on 20 October 2014 (GN No. 891 on Government Gazette No. 38108 refers) (available at: http://www.gov.za/sites/www.gov.za/files/38108__891.pdf) also applied to EIAs in terms of the EIA Regulations, 2014 (as amended).

1. Is the development permitted in terms of the property's existing land use rights?	YES	~~NO~~	~~Please explain~~
The property is zoned for Agriculture.			
2. Will the development be in line with the following?			
(a) Provincial Spatial Development Framework ("**PSDF**").	YES	~~NO~~	~~Please explain~~
The proposed enlargement of the dam would allow for the storage of summer irrigation water. The enlargement of the dam would provide a more efficient use of water which has become a scarce resource, especially in the Western Cape. The water stored will be used for the irrigation of orchards (table grapes & citrus). Agriculture remains the backbone of the Western Cape economy and would lead to economic gains.			
(b) Urban edge / edge of **built environment** for the area.	YES	~~NO~~	~~Please explain~~
The property is part of the existing agricultural environment associated with the larger area and not near any build edge.			
(c) Integrated Development Plan and Spatial Development Framework of the Local Municipality (*e.g.,* would the approval of this application compromise the integrity of the existing approved and credible municipal **IDP and SDF**?).	YES	~~NO~~	~~Please explain~~
The approval of the proposed dam enlargement would not compromise the integrity of the West Coast District Municipality IDP and SDF but will contribute to the more efficient use of an existing water use, a scarce resource. The water stored will be used for the irrigation of fruit orchards. Agriculture remains the backbone of the Western Cape economy and would lead to economic gains.			
(d) An Environmental Management Framework ("**EMF**") adopted by this Department. (*e.g.,* Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)	YES	~~NO~~	~~Please explain~~
The approval of the proposed project, with correct mitigation measures in place, will support environmental management strategic objectives as adopted by the West Coast District Municipality.			
(e) Any **other** Plans (*e.g.,* Integrated Waste Management Plan (for waste management activities), *etc.*)).	~~YES~~	NO	~~Please explain~~
N/A			
3. Is the land use (associated with the project being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (in other words, is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?	YES	~~NO~~	~~Please explain~~
The approval of the propose dam enlargement would not compromise the integrity of the West Coast District Municipality and SDF but will contribute to the more efficient use of an existing water use and a scarce resource. The water stored will be used for the irrigation of fruit orchards. Agriculture remains the backbone of the Western Cape economy and would lead to economic gains.			
4. Should development, or if applicable, expansion of the town/area concerned in terms of this land use (associated with the activity being applied for) occur on the proposed site at this point in time?	~~YES~~	NO	~~Please explain~~

N/A			
5. Does the community/area need the project and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (*e.g.,* development is a National Priority, but within a specific local context it could be inappropriate.)	YES	~~NO~~	~~Please explain~~
The approval of the propose dam enlargement would not compromise the integrity of the West Coast District Municipality IDP and SDF but will contribute to the more efficient use of an existing water use. The water stored will be used for the irrigation of fruit orchards. Agriculture remains the backbone of the Western Cape economy and would lead to economic gains.			
6. Are the necessary **services** available together with adequate unallocated municipal capacity (at the time of application), or must additional capacity be created to cater for the project? (Confirmation by the relevant municipality in this regard must be attached to the BAR as **Appendix E**.)	YES	~~NO~~	~~Please explain~~
There is no need to apply for a new water use license for the *taking of water.* Proof of existing water use right to be proved Francois Joubert from Schoeman en Vennote will initiate the EWULA for other activities that trigger section 21 of the National Water Act. These are the following: • *S21 (b) Storing of water* • *S21 (c) Impeding or diverting the flow of the water course* • *S21 (i) Altering the bed, bank, course or characteristic of a watercourse* • Relocation and extension of irrigation pipelines. Pipeline Ø will vary from 110mm to 250 mm and will be ± 1150m in length. Pipelines to fall within ploughed land. • Relocation of the existing Eskom electrical infrastructure, located directly below the existing dam embankment to downstream of the raised embankment footprint.			
7. Is this project provided for in the **infrastructure planning** of the municipality and if not, what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant municipality in this regard must be attached to the BAR as **Appendix E**.)	YES	~~NO~~	~~Please explain~~
This development is not expected to have any significant impact on infrastructure plans for the Municipality. It will not result in additional infrastructure or water use (or in impact on any existing infrastructure of the Municipality).			
8. Is this project part of a **national programme** to address an issue of national concern or importance?	~~YES~~	NO	~~Please explain~~
N/A			
9. Do location factors favour this land use (associated with the development proposal and associated listed activity(ies) applied for) at this place? (This relates to the contextualisation of the proposed land use on the proposed site within its broader context.)	YES	~~NO~~	~~Please explain~~
Yes, the location favours the land use as the property selected for the dam enlargement is zoned for agriculture and will fit in with surrounding land uses (refer to **Appendix D** for the land use map). The footprint for the enlargement is already available as the area is heavily disturbed with little to no natural vegetation remaining, due to past and current agricultural activities.			
10. Will the development proposal or the land use associated with the development proposal applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?	~~YES~~	NO	~~Please explain~~

No the proposed enlargement of Zwartfontein dam will not impact on sensitive natural or cultural areas. The footprint for the enlargement is already available as the area is heavily disturbed with no natural vegetation remaining, due to past and current agricultural activities. No vegetation will have to be removed.

Comments from HWC (**Appendix E1**) confirms that no heritage resources will be impacted by the proposed enlargement.

11. Will the development impact on people's health and well-being (*e.g.,* in terms of noise, odours, visual character and 'sense of place', *etc.*)?	~~YES~~	NO	~~Please explain~~

No negative health effects are expected for this project during construction / operations. The proposed dam enlargement will be on agricultural land and will fit in with the sense of place.

12. Will the proposed development or the land use associated with the proposed development applied for, result in unacceptable opportunity costs?	~~YES~~	NO	Please explain

The proposed dam enlargement will not result in unpredictable opportunity costs but will contribute to the more efficient use of an existing water use and a scarce resource, which is otherwise lost.

13. What will the **cumulative impacts** (positive and negative) of the proposed land use associated with the development proposal and associated listed activity(ies) applied for, be?

Positive:

- The proposed dam expansion will contribute to the more efficient use of an existing water and a scarce resource.
- The footprint area for the expansion is available with the area being almost completely transformed and disturbed due to past and ongoing agricultural activities. No protected indigenous vegetation and species will be lost
- The potential to rehabilitate and partially restore the drainage line exist, it is recommended that topsoil removed from the drainage lines for construction be stored in a safe place and used for rehabilitation of the drainage lines, after construction.
- Properly managed and designed farm dams can attract a variety of bird, insect and animals to the area and so contribute to conservation of biodiversity.
- The proposed dam enlargement will provide insurance of supply for irrigation of existing irrigation areas, strengthening the agriculture sector which has positive social economic spin off in the Western Cape.

Negative:

- Although the footprint area for the expansion already exists with the area being completely transformed, the proposed dam expansion would contribute to the further transformation of the area.

14. Is the development the **best practicable environmental option** for this land/site?	YES	~~NO~~	~~Please explain~~

At present there are no other viable alternative land use options for these sites (unless to keep it natural).

15. What will the benefits be to society in general and to the local communities?	Please explain

The proposed dam enlargement will provide insurance of supply for irrigation of existing irrigation areas, strengthening the agriculture sector which has positive social economic spin off in the Western Cape.

16. Any **other** need and desirability considerations related to the proposed development?	Please explain

N/A

17. Describe how the **general objectives of Integrated Environmental Management** as set out in Section 23 of the NEMA have been taken into account:

The general objectives of Integrated Environmental Management have been taken into account through the following:

- The actual and potential impacts of the activity on the environment, socio-economic conditions and cultural heritage have been identified, predicted and evaluated, as well as the risks and consequences and alternatives and options for mitigation of activities, with a view to minimizing negative impact, maximizing benefits and promoting compliance with the principles of environmental management – *please refer to Section F below*.
- The effects of the activity on the environment have been considered before actions taken in connection with them – *alternatives have been considered and investigated (please refer to Section E below).*
- Adequate and appropriate opportunity for public participation is ensured through the public participation process
- The environmental attributes have been considered in the management and decision-making of the activity – *an EMP has been included (**Appendix H**) with the proposed activity and must adhere to the requirements of all applicable state Authorities.*

18 Describe how the **principles of environmental management** as set out in Section 2 of the NEMA have been taken into account:

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 have been placed at the forefront while serving their physical, psychological, developmental, cultural and social interests – *the proposed activity will have a beneficial impact on people, regarding their cultural believes.*
- Development must 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. - *Although the activity is expected to have little to no environmental impact, these impacts have been considered, and mitigation measures have been put in place.*
- Where waste cannot be avoided, it is minimised and remedied through the implementation and adherence of EMP.
- The use of non-renewable natural resources is responsible and equitable – *no exploitation of non-renewable natural resources occurs with the proposed activity, the activity aims to better utilize an existing water use.*
- The negative impacts on the environment and on people's environmental rights have been anticipated and prevented, and where they cannot be prevented, are minimised and remedied - *refer to Section F below*.
- 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 have been considered, assessed and evaluated, including the disadvantages and benefits – *refer to Section F below.*
- The effects of decisions on all aspects of the environment and all people in the environment have been taken into account, by pursuing what is considered the best practicable environmental option – *the proposed activity is expected to have minimal/negligible environmental impacts, especially after mitigation measures as described under Section F and in the EMP are implemented.*

SECTION E: DETAILS OF ALL THE ALTERNATIVES CONSIDERED

Note: Before completing this section, first consult this Department's Circular EADP 0028/2014 (dated 9 December 2014) on the "One Environmental Management System" and the EIA Regulations, 2014 (as amended), any subsequent Circulars, and guidelines available on the Department's website **http://www.westerncape.gov.za/eadp**.

The EIA Regulations, 2014 (as amended) defines "*alternatives*" as " *in relation to a proposed activity, means different means of fulfilling the general purpose and requirements of the activity, which may include alternatives to the—*
(a) property on which or location where the activity is proposed to be undertaken;
(b) type of activity to be undertaken;
(c) design or layout of the activity;
(d) technology to be used in the activity; or
(e) operational aspects of the activity;
(f) and includes the option of not implementing the activity;"

The NEMA (section 24(4)(a) and (b) of the NEMA, refers) prescribes that the procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment must, *inter alia*, with respect to every application for environmental authorisation –

- ensure that the general objectives of integrated environmental management laid down in the NEMA and the National Environmental Management Principles set out in the NEMA are taken into account; and
- include an investigation of the potential consequences or impacts of the alternatives to the activity on the environment and assessment of the significance of those potential consequences or impacts, including the option of not implementing the activity.

The general objective of integrated environmental management (section 23 of NEMA, refers) is, *inter alia*, to "*identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts, maximising benefits, and promoting compliance with the principles of environmental management*" set out in the NEMA.

The identification, evaluation, consideration and comparative assessment of alternatives directly relate to the management of impacts. Related to every identified impact, alternatives, modifications or changes to the activity must be identified, evaluated, considered and comparatively considered to:

- in terms of negative impacts, firstly avoid a negative impact altogether, or if avoidance is not possible alternatives to better mitigate, manage and remediate a negative impact and to compensate for/offset any impacts that remain after mitigation and remediation; and
- in terms of positive impacts, maximise impacts.

1. DETAILS OF THE IDENTIFIED AND CONSIDERED ALTERNATIVES AND INDICATE THOSE ALTERNATIVES THAT WERE FOUND TO BE FEASIBLE AND REASONABLE

Note: A full description of the investigation of alternatives must be provided and motivation if no reasonable or feasible alternatives exists.

(a) Property and **location/site** alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts, or detailed motivation if no reasonable or feasible alternatives exist:

Location alternative in terms of Zwartfontein dam:

No Location/ site alternatives were investigated in terms of the dam as this application is for the proposed enlargement of the existing Zwartfontein dam. Portion 8 and RE Farm Zwartfontein 792 is only location for the dam enlargement.

Locality alternatives in terms of the pump station components were investigated.

Location alternatives in term of relocation of pumphouse components:

The exiting pumphouse is made out of two sections: The pump station comprising of pumps, filters and compost pumps as well as compost tanks stored in a bunded area. Please refer to Figure 1 below for the existing facility.

With the dam enlargement and raising of the dam wall it is proposed that the pumphouse and compost storage facility be split in two sections (1) The pump station containing pumps and filters and (2) the compost storage tanks in a bunded area. Locality alternative in terms of the compost storage facility was investigated.

Locality Alternative A: Pump station (Only alternative):

- It is proposed than the pump station containing pumps and filters be relocated approximately 65m SW downstream of the raised dam wall on the northern bank of the drainage line/stream. The footprint of the pumphouse will be ± 200m² on the bank the drainage line/stream. this location is favoured and considered the only viable alternative due to energy saving costs. Water will flow from the dam to the pumphouse via gravitation.

Locality Alternative A: Compost storage facility (Preferred Alternative):

- It is proposed that the compost storage facility be constructed next to the house on the property (Alternative A – preferred). This storage facility will store up to maximum 80 000L or 80m³ of compost and comprise off a cement slab with walls with no roof to contain any possible spills. The storage facility must comply to National Norms and Standards for the storage of Waste in terms of the National Environmental Management: Waste Act (Act No. 59 of 2008). The compost storage facility next to the house will have footprint of approximately 100m². The pump station and compost tanks to be connected with an approximately 40mmØ, 100m pipeline.

- Alternative A is favoured due to ease of access for large delivery trucks delivering compost. An existing access road to the site exists and less disturbance to the environment will occur.

Locality Alternative B: Pumphouse components (Not preferred)

- Another alternative location was considered in terms of the compost storage facility. Alternative B would be to relocate and construct the compost storage facility next to the proposed new pumphouse, downstream of the raised dam wall on the northern bank of the drainage line/stream

- However the impact on the environment and drainage line would be more significant (when compared to Alternative A) as no access raods to the proposed site exists for delivery trucks. A road will have to be constructed and disturbance on the environment will be more significant when compared to Alternative A. It is for this reason that Alternative B is not preferred.

Location alternatives of associated infrastructure:

Due to the downstream increase of the dam wall, associated dam infrastructure such as the existing pumphouse including compost storage facility, outlet pipe and Eskom electrical infrastructure will have to be relocated. The dam enlargement will inundate the existing access road around the existing dam and therefore a new access road around the dam footprint is proposed.

Locality Alternative A: Irrigation Infrastructure (Only Alternative):

- Relocation and extension of irrigation pipelines to connect to existing irrigation pipelines. Pipeline Ø will vary from 110mm to 250 mm and will be ± 1150m in length
  Pipelines to fall within ploughed land.

Locality Alternative A: Eskom infrastructure (Only Alternative):

- Relocation of the existing Eskom electrical infrastructure, located directly below the existing dam embankment wall to downstream of the raised dam wall footprint. Relocation in line with Eskom legal requirements.

Locality Alternative A: Access road (Only Alternative):

- Due to the enlargement of the dam the existing access roads around the existing dam will be inundated, Therefore the allowance of a maximum 10m wide and 1600m long access road around the dam footprint was the only alternative considered and investigated.

Figure 14: Existing pump house and compost tanks to be relocated.

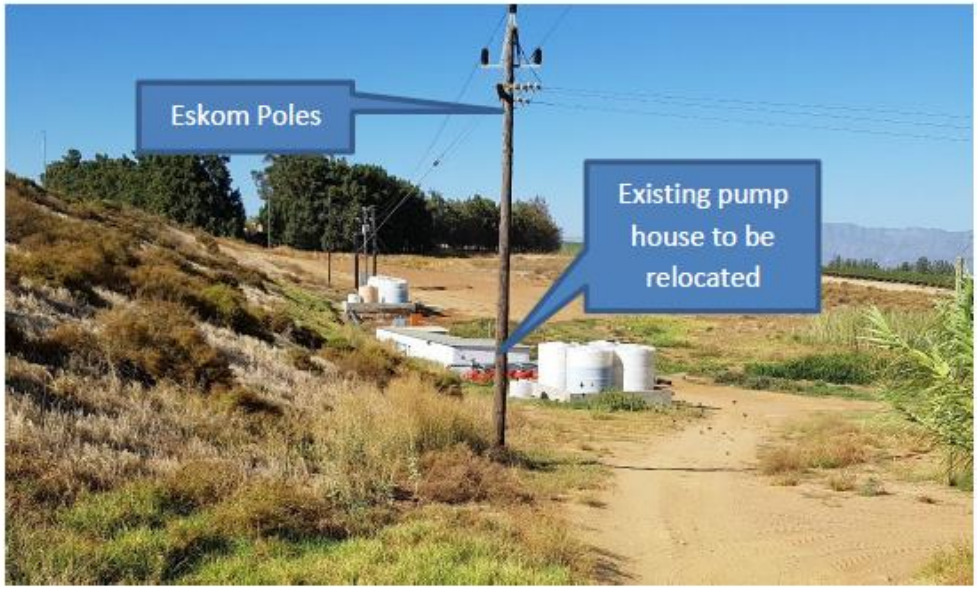

Figure 15: Existing Eskom poles and pumphouse to be relocated.

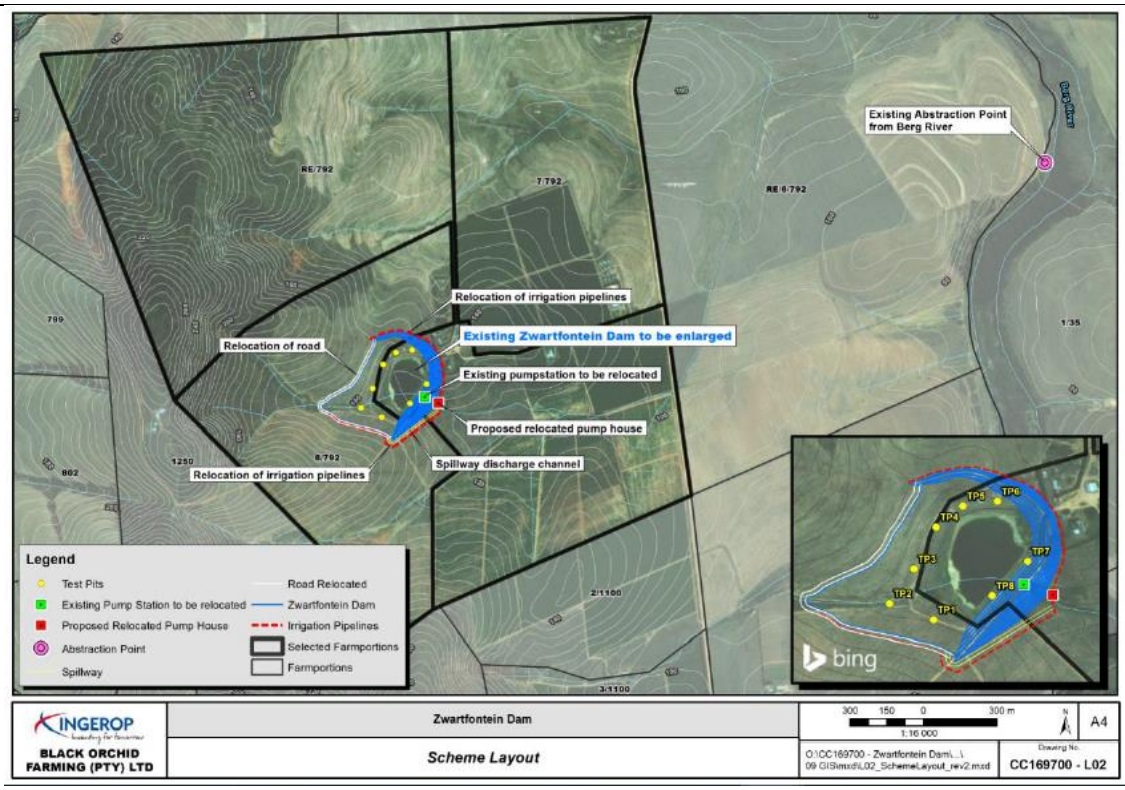

Figure 16: Site plan, Engineers Technical Report indicating the proposed and preferred relocation of dam infrastructure, Ingerop, 2019

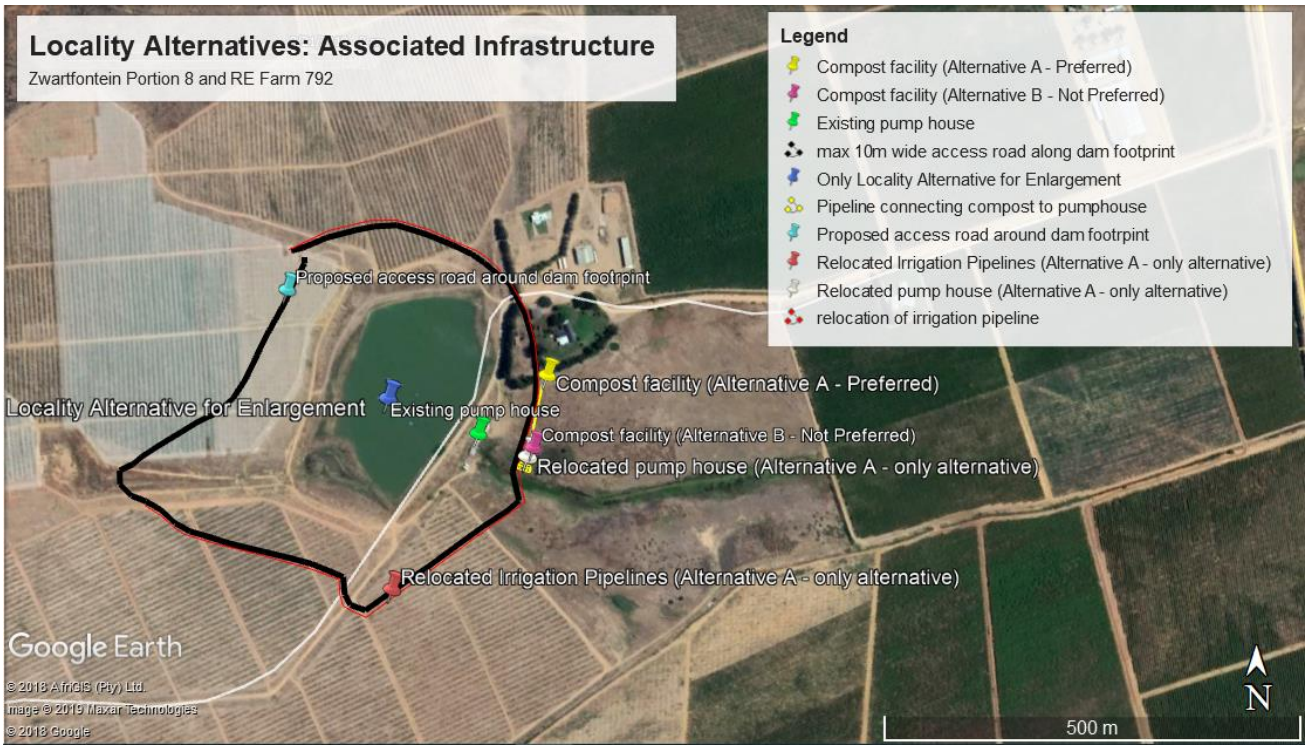

Figure 17: Google image showing locality alternatives investigated in terms of associated dam infrastrucutre relocation

(b) **Activity** alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts, or detailed motivation if no reasonable or feasible alternatives exist:

No activity alternatives are investigated this application is for the proposed enlargement of the existing Zwartfontein dam.

(c) **Design or layout** alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts, or detailed motivation if no reasonable or feasible alternatives exist:

Dam Layout/ Design Alternatives in terms of the Enlargement of Zwartfonetin Dam:

According to the Engineers Technical Report (Appendix K) various dam design were investigated. Different raising size options were considered, with upstream, downstream and centre raining options investigated for a detailed cost comparison as summarised in Table 5 of the report.

The downstream raisings were preferred for keeping the existing dam in operation while constructing the raised embankment as well as ease of construction to avoid unnecessary sediment removal on the upstream side as well as creating sufficient working space on the downstream side for a complete new central core zone and core trench.

Layout/Design Alternative A: Option 10 (Only viable alternative):

The final layout/design Alternative A, Option10, is considered the only viable alternative. Table 5 in the report (Appendix K) indicates the water/wall ration investigated and represents the volume of water gained per volume of fill required to construct the dam embankment. This is a good indication for selecting the most economical dam design. It is for this reason and the reasons as stated above that Alternative A, Option 10 is considered the best economical option and therefore the only viable dam design available. Alternative A, Option 10 was preferred due to its target storage capacity being in line with the storage demand.

Design/ Layout Alternatives, Option 1 – 9 are included in Appendix B and are not economically viable alternatives and will therefore not be investigated any further.

(d) **Technology** alternatives (*e.g.,* to reduce resource demand and increase resource use efficiency) to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts, or detailed motivation if no reasonable or feasible alternatives exist:

No technology alternatives applicable.

(e) **Operational** alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts, or detailed motivation if no reasonable or feasible alternatives exist:

No operational alternatives considered or applicable.

(f) The option of **not implementing** the activity (the '*No-Go*' Option):

The no-go alternative will result in no further development, which will mean that there will be no impact on the environment. The 'status quo' will persist and the site will remain as is, transformed and disturbed. Although this no-go option will not result in potential negative environmental impacts, the potential social economic benefits from implementing the activity would not be achieved

(g) **Other** alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts, or detailed motivation if no reasonable or feasible alternatives exist:

No other alternatives were investigated.
It is the opinion of the Freshwater specialist and Botanical specialist that the footprint for the expansion is available due to the area being transformed meaning that not water or botanic resources will be lost because of the proposed expansion.

(h) Provide a **summary** of all alternatives investigated and the outcome of each investigation:

Location alternatives in term of relocation of Zwartfontein dam enlargement:

Portion 8 and RE Farm Zwartfontein 792 is only location for the dam enlargement.
No Location/ site alternatives were investigated in terms of the dam as this application is for the proposed enlargement of the existing Zwartfontein dam.

Location alternatives in term of relocation of pumphouse components:

Locality Alternative A: Pump station (Only alternative):

- It is proposed than the pump station containing pumps and filters be relocated approximately 65m SW downstream of the raised dam wall on the northern bank of the drainage line/stream. The footprint of the pumphouse will be ± 200m² on the bank the drainage line/stream. this location is favoured and considered the only viable alternative due to energy saving costs. Water will flow from the dam to the pumphouse via gravitation.

Locality Alternative A: Compost storage facility (Preferred Alternative):

- It is proposed that the compost storage facility (100m²) be constructed next to the house on the property The pump station and compost tanks to be connected with an approximately 40mmØ, 100m pipeline.
- Alternative A is favoured due to ease of access for large delivery trucks delivering compost. An existing access road to the site exists and less disturbance to the environment will occur.

Locality Alternative B: Pumphouse components (Not preferred)

- Another alternative location was considered in terms of the compost storage facility. Alternative B would be to relocate and construct the compost storage facility next to the proposed new pumphouse, downstream of the raised dam wall on the northern bank of the drainage line/stream
- Alternative B is not preferred as no access roads to the proposed site exists for delivery trucks. A road will have to be constructed and disturbance on the environment will be more significant

Location alternatives of associated infrastructure:

Due to the downstream increase of the dam wall, associated dam infrastructure such as the existing pumphouse including compost storage facility, outlet pipe and Eskom electrical infrastructure will have to be relocated. The dam enlargement will inundate the existing access road around the existing dam and therefore a new access road around the dam footprint is proposed.

Locality Alternative A: Irrigation Infrastructure (Only Alternative):

- Relocation and extension of irrigation pipelines to connect to existing irrigation pipelines. Pipeline Ø will vary from 110mm to 250 mm and will be ± 1150m in length
  Pipelines to fall within ploughed land.

Locality Alternative A: Eskom infrastructure (Only Alternative):

- Relocation of the existing Eskom electrical infrastructure, located directly below the existing dam embankment wall to downstream of the raised dam wall footprint. Relocation in line with Eskom legal requirements.

Locality Alternative A: Access road (Only Alternative):

- Due to the enlargement of the dam the existing access roads around the existing dam will be inundated, Therefore the allowance of a maximum 10m wide and 1600m long access road around the dam footprint was the only alternative considered and investigated.

Please refer to Appendix A, locality maps.

Dam Layout/ Design Alternatives in terms of the of Zwartfonetin Dam enlargement:

Layout/Design Alternative A: Option 10 (Only viable alternative):

- The final layout/design Alternative A, Option10, is considered the most economical dam design and therefore the only viable alternative. Table 5 in the Engineers Technical Report (Appendix K) indicates the water/wall ration investigated and represents the volume of water gained per volume of fill required to construct the dam embankment.

Design/ Layout Alternatives, Option 1 – 9 are included in Appendix B and comparatively assessed in Table 5 (Appendix K) and are not considered economically viable alternatives and will therefore not be investigated any further.

(i) Provide a detailed **motivation for not further considering** the alternatives that were found not feasible and reasonable, including a description and proof of the investigation of those alternatives:

Layout/ Design alternatives in terms of Zwartfontein dam enlargement:

Design/ Layout Alternatives, Option 1 – 9 are included in Appendix B and comparatively assessed in Table 5 (Appendix K) and are not considered economically viable alternatives and will therefore not be investigated any further.

2. PREFERRED ALTERNATIVE

(a) Provide a **concluding statement** indicating the preferred alternative(s), including preferred location, site, activity and technology for the development.

Location alternative in terms of Zwartfontein dam:

No Location/ site alternatives were investigated in terms of the dam as this application is for the proposed enlargement of the existing Zwartfontein dam. Portion 8 and RE Farm Zwartfontein 792 is only location for the dam enlargement

Locality alternatives in terms of the pump station were investigated

Location alternatives in term of relocation of pumphouse components:

The exiting pumphouse is made out of two sections: The pump station comprising of pumps, filters and compost pumps as well as compost tanks stored in a bunded area. Please refer to Figure 1 below for the existing facility.

With the dam enlargement and raising of the dam wall it is proposed that the pumphouse and compost storage facility be split in two sections (1) The pump station containing pumps and filters and (2) the compost storage tanks in a bunded area. Locality alternative in terms of the compost storage facility was investigated.

Locality Alternative A: Pump station (Only alternative):

- It is proposed than the pump station containing pumps and filters be relocated approximately 65m SW downstream of the raised dam wall on the northern bank of the drainage line/stream. The footprint of the pumphouse will be ± 200m² on the bank the drainage line/stream. this location is favoured and considered the only viable alternative due to energy saving costs. Water will flow from the dam to the pumphouse via gravitation.

Locality Alternative A: Compost storage facility (Preferred Alternative):

- It is proposed that the compost storage facility be constructed next to the house on the property (Alternative A – preferred). This storage facility will store up to maximum 80 000L or 80m³ of compost and comprise off a cement slab with walls with no roof to contain any possible spills. The storage facility must comply to National Norms and Standards for the storage of Waste in terms of the National Environmental Management: Waste Act (Act No. 59 of 2008). The compost storage facility next to the house will have footprint of approximately 100m². The pump station and compost tanks to be connected with an approximately 40mmØ, 100m pipeline.

- Alternative A is favoured due to ease of access for large delivery trucks delivering compost. An existing access road to the site exists and less disturbance to the environment will occur.

Location alternatives of associated infrastructure:

Due to the downstream increase of the dam wall, associated dam infrastructure such as the existing pumphouse including compost storage facility, outlet pipe and Eskom electrical infrastructure will have to be relocated. The dam enlargement will inundate the existing access road around the existing dam and therefore a new access road around the dam footprint is proposed.

Locality Alternative A: Irrigation Infrastructure (Only Alternative):

- Relocation and extension of irrigation pipelines to connect to existing irrigation pipelines. Pipeline Ø will vary from 110mm to 250 mm and will be ± 1150m in length
  Pipelines to fall within ploughed land.

Locality Alternative A: Eskom infrastructure (Only Alternative):

- Relocation of the existing Eskom electrical infrastructure, located directly below the existing dam embankment next to the

Locality Alternative A: Access road (Only Alternative):

- Due to the enlargement of the dam the existing access roads around the existing dam will be inundated, Therefore the allowance of a maximum 10m wide and 1600m long access road around the dam footprint was the only alternative considered and investigated.

Dam Layout/ Design Alternatives in terms of the Enlargement of Zwartfonetin Dam:

According to the Engineers Technical Report (Appendix K) various dam design were investigated. Different raising size options were considered, with upstream, downstream and centre raining options investigated for a detailed cost comparison as summarised in Table 5 of the report.

The downstream raisings were preferred for keeping the existing dam in operation while constructing the raised embankment as well as ease of construction to avoid unnecessary sediment removal on the upstream side as well as creating sufficient working space on the downstream side for a complete new central core zone and core trench.

Layout/Design Alternative A: Option 10 (Only viable alternative):

The final layout/design Alternative A, Option10, is considered the only viable alternative. Table 5 in the report (Appendix K) indicates the water/wall ration investigated and represents the volume of water gained per volume of fill required to construct the dam embankment. This is a good indication for selecting the most economical dam design. It is for this reason and the reasons as stated above that Alternative A, Option 10 is considered the best economical option and therefore the only viable dam design available. Alternative A, Option 10 was preferred due to its target storage capacity being in line with the storage demand.

Design/ Layout Alternatives, Option 1 – 9 are included in Appendix B and are not economically viable alternatives and will therefore not be investigated any further.

From an environmental perspective, the proposed dam enlargement, irrespective of Design option, will not cause further loss of protected vegetation or contribute to the transformation of the drainage line any further. However, with the preferred Dam Design/Layout Alternative A: Option 10, approximately 4.3ha agricultural land will be sacrificed.

The proposed relocation of the compost storage facility next to the house (Alternative A) will reduce further impact on the drainage line when compared to the original location and Alternative B , next to the new relocated pumphouse on the northern bank of the drainage line. Trucks delivering compost will utilise the existing road and avoid the drainage line completely.

SECTION F: ENVIRONMENTAL ASPECTS ASSOCIATED WITH THE ALTERNATIVES

Note: The information in this section must be DUPLICATED for all the feasible and reasonable ALTERNATIVES.

1. DESCRIBE THE ENVIRONMENTAL ASPECTS ASSOCIATED WITH THE PROPOSED DEVELOPMENT AND ITS ALTERNATIVES, FOCUSING ON THE FOLLOWING:

(a) Geographical, geological and physical aspects:

Please see the explanation on the next page.

Design Option 10 is considered the only economically viable alternative for the proposed enlargement of Zwartfontein dam and is therefore the only preferred alternative. Associated infrastructure will also have to be relocated as indicated in Figure 17 above as well as Appendix A.

According to the Biodiversity, Freshwater and comments from Heritage Western Cape. the proposed enlargement of Zwartfontein Dam will not have a significant impact on geographical, geological or physical environmental or heritage aspects as the site and associated drainage line is considered transformed with little no indigenous vegetation present on site. This is due to past and current agricultural activities on the farm and surrounds.

Topography:

According to specialist reports Appendix G, the study area lies in the Swartland which consist of a broad rural expanse of low rolling hills intermingled with farms, small communities and towns. Before intense agricultural practices, the Swartland was characterised by "Renosterveld" vegetation which gave the area a dark grey olive viewed from afar - hence the name Swartland (black country). The Berg River separates Zwartfontein Farms from the Elandskloof mountains. The landscape is considered a rolling, undulation of low hills, interrupted by the Cape Fold Mountains. The proposed dam will therefore be consistent with the existing agricultural landscape of the Swartland.

Geology and soils:

The Heritage screener (Appendix G3.1) states that the underlying geology at the site consist of schists and shales of the Malmesbury Group considered to be good agricultural land, the shale being rich in trace elements. According to the Engineers Technical Report (Appendix K) a geotechnical investigation was completed in May 2019 where 8 test pits were excavated and two samples were taken for testing. Results are included the report. The materials (core and general fill) for the raising of the embankment is proposed to be excavated from the dam basin. Filter material required for chimney and blanket drain (sand), rock toe and rip-rap for upstream slope protection is all proposed to be imported from commercial sources.

Heritage Resources:

The Heritage screener conducted by CTS Heritage (Appendix G3.1) concluded that no structurers with heritage significance will be impacted by the proposed enlargement of the dam. In terms of archaeological, while it may be likely that, due to its proximity to the Berg River, that archaeological resources may be located within the proposed development area, it is unlikely that these resources will be in situ due to the extensive agricultural activity that has occurred on this site. Furthermore, no impacts to significant palaeontological resources are anticipated. HWC provided comment (Appendix E2) stating that the proposed dam enlargement will not impact on heritage resources.

Vegetation:

According to the Vegetation map from Cape Farm Mapper, Appendix D, the vegetation that would have been present on the site is Swartland Shale Renosterveld. This type of vegetation is classified as *Critically Endangered* in terms of the *National Environmental Management: Biodiversity Act 2004, National List of Ecosystems that are threatened and in need of protection (NEMBA).*

However, The Botanical assessment concludes that the proposed dam enlargement will not impact on any remaining vegetation or plant species of significant conservation value. Most of the terrain and its immediate surroundings are considered heavily degraded to transformed, only a few indigenous species and alien pioneer species remains

Therefore the proposed dam enlargement, irrespective of Design option, will not cause further loss of protected vegetation. With the preferred Dam Design/Layout Alternative A: Option 10, approximately 4.3ha agricultural will be sacrificed.

(b) Ecological aspects:

Will the proposed development and its alternatives have an impact on CBAs or ESAs? If yes, please explain: Also include a description of how the proposed development will influence the quantitative values (hectares/percentage) of the categories on the CBA/ESA map.	YES	NO

From the Biodiversity Overlay Maps from Cape Farm Mapper (**Appendix D**) and the Botanical Assessment conducted by the Biodiversity Specialist (**Appendix G1**) the site falls within a small Critical Biodiversity Area (CBA). However, the small CBA is located within the dam. The dam will also further impact Ecological Support Area Class 2 (ESA2). The report further states that special care was taken when this area was studies in order to check for any special vegetation features. The terrain and its immediate surroundings are considered heavily degraded and transformed with only a few hardy indigenous species remains. It is recommended that topsoil removed from the drainage lines for construction be stored in a safe place and used for rehabilitation of the drainage lines, after construction. Properly managed and designed farm dams can attract a variety of bird, insect and animals to the area and so contribute to conservation of biodiversity.

The Botanical Assessment concludes that the proposed development will not lead to any significant on any remaining vegetation or plant species of significant conservation value. Properly managed and designed farm dams can attract a variety of bird, insect and animals to the area and so contribute to conservation of biodiversity.

From an environmental perspective, the proposed dam enlargement, irrespective of Design option, will not cause further loss of protected vegetation or contribute to the transformation of the drainage line any further. However, with the preferred Dam Design/Layout Alternative A: Option 10, approximately 4.3ha agricultural land will be sacrificed.

The proposed relocation of the compost storage facility next to the house (Alternative A) will reduce further impact on the drainage line when compared to the original location and Alternative B , next to the new relocated pumphouse on the northern bank of the drainage line. Trucks delivering compost will utilise the existing road and avoid the drainage line completely.

Will the proposed development and its alternatives have an impact on terrestrial vegetation, or aquatic ecosystems (wetlands, estuaries or the coastline)? If yes, please explain:	YES	NO

Vegetation:

According to the Vegetation map from Cape Farm Mapper, Appendix D, the vegetation that would have been present on the site is Swartland Shale Renosterveld. This type of vegetation is classified as *Critically Endangered* in terms of the *National Environmental Management: Biodiversity Act 2004, National List of Ecosystems that are threatened and in need of protection (NEMBA).*

However, The Botanical assessment concludes that the proposed dam enlargement will not impact on any remaining vegetation or plant species of significant conservation value. Most of the terrain and its immediate surroundings are considered heavily degraded to transformed, only a few indigenous species and alien pioneer species remains

Therefore the proposed dam enlargement, irrespective of Design option as well as associated infrastructure, will cause further loss of protected vegetation.

Freshwater resources:

According to the Freshwater Report, Appendix G2, the non-perennial stream which the Zwartfontein dam intersects, as indicated on the Water Resources Map from Cape Farm Mapper (Appendix D) is considered a drainage line. The drainage line is approx. 4,4k long. The drainage line upstream of the dam takes the shape of wide valleys with no discernible drainage line and with the same vegetation as elsewhere on the hill. The drainage line down-stream of the dam has been transformed into a straight agricultural return flow furrow, all the way down to its confluence with the Berg River. The drainage line is considered to be overgrown with reeds and is considered transformed and degraded.

The proposed dam will be filled with water from the Berg River, from an existing abstraction point with existing water use rights enlisted under the Berg River Irrigation Board. The existing abstraction point will remain as is. The freshwater report concludes that the existing legal water use is already fully utilised for irrigation and has already been discounted by the DWS against ecological flow requirements of the Berg river, and the proposed extra storage capacity would not alter the situation. However, with large irrigation schemes there is always the possibility of more agricultural return flow which impact the river system. However, the drainage lines have already been transformed into stormwater management systems and return flows and the enlargement of the dam will not add to these impacts.

From an environmental perspective, the proposed dam enlargement, irrespective of Design option, will not cause further loss of protected vegetation or contribute to the transformation of the drainage line any further. However, with the preferred Dam Design/Layout Alternative A: Option 10, approximately 4.3ha agricultural land will be sacrificed.

The proposed relocation of the compost storage facility next to the house (Alternative A) will reduce further impact on the drainage line when compared to the original location and Alternative B , next to the new relocated pumphouse on the northern bank of the drainage line. Trucks delivering compost will utilise the existing road and avoid the drainage line completely.

Will the proposed development and its alternatives have an impact on any populations of threatened plant or animal species, and/or on any habitat that may contain a unique signature of plant or animal species? If yes, please explain:	YES	NO
No threatened plant or animal species/ habitat encountered.		
Describe the manner in which any other biological aspects will be impacted:		
No, please refer to the explanations above.		
Will the proposed development also trigger section 63 of the NEM: ICMA?	YES	NO

If yes, describe the following: (i) the extent to which the applicant has in the past complied with similar authorisations; (ii) whether coastal public property, the coastal protection zone or coastal access land will be affected, and if so, the extent to which the proposed development proposal or listed activity is consistent with the purpose for establishing and protecting those areas; (iii) the estuarine management plans, coastal management programmes, coastal management lines and coastal management objectives applicable in the area; (iv) the likely socio-economic impact if the listed activity is authorised or is not authorised; (v) the likely impact of coastal environmental processes on the proposed development; (vi) whether the development proposal or listed activity— (a) is situated within coastal public property and is inconsistent with the objective of conserving and enhancing coastal public property for the benefit of current and future generations; (b) is situated within the coastal protection zone and is inconsistent with the purpose for which a coastal protection zone is established as set out in section 17 of NEM: ICMA; (c) is situated within coastal access land and is inconsistent with the purpose for which coastal access land is designated as set out in section 18 of NEM: ICMA; (d) is likely to cause irreversible or long-lasting adverse effects to any aspect of the coastal environment that cannot satisfactorily be mitigated; (e) is likely to be significantly damaged or prejudiced by dynamic coastal processes; (f) would substantially prejudice the achievement of any coastal management objective; or (g) would be contrary to the interests of the whole community; (vii) whether the very nature of the proposed activity or development requires it to be located within coastal public property, the coastal protection zone or coastal access land; (viii) whether the proposed development will provide important services to the public when using coastal public property, the coastal protection zone, coastal access land or a coastal protected area; and (ix) the objects of NEM: ICMA, where applicable.
N/A

(c) Social and Economic aspects:

Information was sourced from the applicant and will be included in the next BAR for comment.

What is the expected capital value of the project on completion?	R	
What is the expected yearly income or contribution to the economy that will be generated by or as a result of the project?	R	
Will the project contribute to service infrastructure?	YES	NO
Is the project a public amenity?	YES	NO
How many new employment opportunities will be created during the development phase?		
What is the expected value of the employment opportunities during the development phase?	R	
What percentage of this will accrue to previously disadvantaged individuals?		%
How will this be ensured and monitored (please explain):		
How many permanent new employment opportunities will be created during the operational phase of the project?		
What is the expected current value of the employment opportunities during the first 10 years?	R	
What percentage of this will accrue to previously disadvantaged individuals?		%
How will this be ensured and monitored (please explain):		
Any other information related to the manner in which the socio-economic aspects will be impacted:		

(d) Heritage and Cultural aspects:

The Heritage screener conducted by CTS Heritage (Appendix G3.1) concluded that no structurers with heritage significance will be impacted by the proposed enlargement of the dam. In terms of archaeological, while it may be likely that, due to its proximity to the Berg River, that archaeological resources may be located within the proposed development area, it is unlikely that these resources will be in situ due to the extensive agricultural activity that has occurred on this site. Furthermore, no impacts to significant palaeontological resources are anticipated. HWC provided comment (Appendix E2) stating that the proposed dam enlargement will not impact on heritage resources.

2. WASTE AND EMISSIONS

(a) Waste (including effluent) management

Will the development proposal produce waste (including rubble) during the development phase?	~~YES~~	NO
If yes, indicate the types of waste (actual type of waste, *e.g.* oil, and whether hazardous or not) and estimated quantity per type?	Unsure m^3	
Excavations from the dam basin will be used to construct the dam wall. Rubble form demolition of the existing pumphouse to be disposed of at a registered facility.		

Will the development proposal produce waste during its operational phase?	~~YES~~	NO
If yes, indicate the types of waste (actual type of waste, *e.g.* oil, and whether hazardous or not) and estimated quantity per type?		m^3
No waste to be produced during operations.		

Will the development proposal require waste to be treated / disposed of on site?	~~YES~~	NO
If yes, indicate the types of waste (actual type of waste, *e.g.* oil, and whether hazardous or not) and estimated quantity per type per phase of the proposed development to be treated/disposed of?		m^3
No waste to be produced during operations.		
If no, where and how will the waste be treated / disposed of? Please explain. Indicate the types of waste (actual type of waste, *e.g.* oil, and whether hazardous or not) and estimated quantity per type per phase of the proposed development to be treated/disposed of?		m^3
No waste to be produced during operations.		
Has the municipality or relevant authority confirmed that sufficient capacity exists for treating / disposing of the waste to be generated by the development proposal? If yes, provide written confirmation from the municipality or relevant authority. N/A	YES	NO
Will the development proposal produce waste that will be treated and/or disposed of at another facility other than into a municipal waste stream? N/A	YES	NO
If yes, has this facility confirmed that sufficient capacity exists for treating / disposing of the waste to be generated by the development proposal? Provide written confirmation from the facility. N/A	YES	NO
Does the facility have an operating license? (If yes, please attach a copy of the licence.) N/A	YES	NO

Facility name:	
Contact person:	
Cell:	Postal address:
Telephone:	Postal code:
Fax:	E-mail:

Describe the measures that will be taken to reduce, reuse or recycle waste:
Litter on site should be minimised with bins dedicated for food scraps and plastic/paper. Recyclable waste should be disposed of at a dedicated recycle point.

(b) Emissions into the atmosphere

Will the development proposal produce emissions that will be released into the atmosphere?	YES	NO
If yes, does this require approval in terms of relevant legislation?	~~YES~~	NO
If yes, what is the approximate volume(s) of emissions released into the atmosphere?		m^3
Describe the emissions in terms of type and concentration and how these will be avoided/managed/treated/mitigated:		
No emissions to be produced		

3. WATER USE

(a) Indicate the source(s) of water for the development proposal by highlighting the appropriate box(es).

~~Municipal~~	Water board	Groundwater	~~River, Stream, Dam or Lake~~	~~Other~~	~~The project will not use water~~

Note: Provide proof of assurance of water supply (e.g. Letter of confirmation from the municipality / water user associations, yield of borehole)

There is no need to apply for a new water use license for the *taking of water.* Proof to be provided.

Francois Joubert from Schoeman en Vennote will initiate the EWULA for other activities that trigger section 21 of the National Water Act. These are the following:

- *S21 (b) Storing of water*
- *S21 (c) Impeding or diverting the flow of the water course*
- *S21 (i) Altering the bed, bank, course or characteristic of a watercourse*

(b) If water is to be extracted from a groundwater source, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:	To be provided	m^3

(c) Does the development proposal require a water use permit / license from DWS?	YES	~~NO~~
If yes, please submit the necessary application to the DWS and attach proof thereof to this application as an Appendix.		

Please refer to explanation above.
The pre-application enquiry was lodged to DWS was done on the EWULA system (Appendix E2)

(d) Describe the measures that will be taken to reduce water demand, and measures to reuse or recycle water:
The proposed expansion of the dam will allow for the better utilisation of an existing water use right and scare resource. Drip irrigation is proposed which will save water.

4. POWER SUPPLY

(a) Describe the source of power *e.g.* municipality / Eskom / renewable energy source.

Electricity from existing Eskom connections. Eskom infrastructure to be relocated due to dam enlargement.

(b) If power supply is not available, where will power be sourced?

Electricity from existing Eskom connections. Eskom infrastructure to be relocated due to dam enlargement

5. ENERGY EFFICIENCY

(a) Describe the design measures, if any, that have been taken to ensure that the development proposal will be energy efficient:

The new position of the pump house (Alternative A – Preferred) was chosen due to gravitational benefits. Water will therefore not have to be pumped from the dam to the pumphouse from where it will be used for irrigation but will flow via gravity, reducing pumping cost.

(b) Describe how alternative energy sources have been taken into account or been built into the design of the project, if any:

It is proposed that drip irrigation be used which does not only save water but also energy (pumping cost).

6. TRANSPORT, TRAFFIC AND ACCESS

Describe the impacts in terms of transport, traffic and access.

Existing access roads to the dam, however, the existing access roads around the existing dam footprint will be inundated by the dam enlargement. It is therefore proposed that a 10m wide and 1600m long road be constructed along the dam footprint.
It is further proposed that the compost storage facility (a component of the pump house) be reliacted next to the house and not next to the new position of the pump house, north of the drainage line below the raised dam wall. The motivation for this is ease of access for large delivery trucks and less significant impact on the drainage line.

7. NUISANCE FACTOR (NOISE, ODOUR, etc.)

Describe the potential nuisance factor or impacts in terms of noise and odours.

No odours is expected during construction or operations. Construction noise expected – limit construction to daylight hours.

Note: Include impacts that the surrounding environment will have on the proposed development.

8. OTHER

Should other factors impacted the environment be identified they will be addressed.

SECTION G: IMPACT ASSESSMENT, IMPACT AVOIDANCE, MANAGEMENT, MITIGATION AND MONITORING MEASURES

1. METHODOLOGY USED IN DETERMINING AND RANKING ENVIRONMENTAL IMPACTS AND RISKS ASSOCIATED WITH THE ALTERNATIVES

(a) Describe the **methodology** used in determining and ranking the nature, significance consequences, extent, duration and probability of potential environmental impacts and risks associated with the proposed development and alternatives.

Please refer to **Appendix J1** for the methodology applied for the environmental impacts and risk assessment for the proposed expansion of Zwartfontein dam as well as the relocation of associated infrastructure.

(b) Please describe any gaps in knowledge.

There are no significant gaps of knowledge that have been identified.

(c) Please describe the underlying assumptions.

The following assumptions are made:

- The information on which the report is based (i.e. project information) is correct.
- The construction and management of this proposed development will be in line with the recommendations in this report, which will be enforced by the implementation of detailed Environmental Management Plan. Much of the long-term success lies in the effective implementation of the measures prescribed in the Environmental Management Plan.

(d) Please describe the uncertainties.

There are no uncertainties that we are aware of at present.

(e) Describe adequacy of the assessment methods used.

The assessment criteria are based on the EIA Guidelines, published by the Department of Environmental Affairs and Tourism (June 2006) in support of the EIA Regulations, 2014 (as amended 2017).

2. IDENTIFICATION, ASSESSMENT AND RANKING OF IMPACTS TO REACH THE PROPOSED ALTERNATIVES INCLUDING THE PREFERRED ALTERNATIVE WITHIN THE SITE

Note: In this section the focus is on the identified issues, impacts and risks that influenced the identification of the alternatives. This includes how aspects of the receiving environment have influenced the selection.

(a) List the identified impacts and risks for each alternative.

Alternative A – Option 10: Only viable option for Zwartfontein Dam Enlargement	Botanical – Loss of vegetation; loss of ESA, contamination of soils; Water – Alternation of hydrology/ drainage lines, loss of riparian habitat Heritage – loss of Heritage resources Visual Dust
Alternative A Pumphouse position (Only alternative	Botanical – Loss of vegetation; loss of ESA, contamination of soils; Water – Alternation of hydrology/ drainage lines, loss of riparian habitat Heritage – loss of Heritage resources Visual Dust
Alternative A: Compost storage facility (Preferred Alternative)	Botanical – Loss of vegetation; loss of ESA, contamination of soils; Water – Alternation of hydrology/ drainage lines, loss of riparian habitat Heritage – loss of Heritage resources Visual Dust
Alternative B: Compost storage facility (Not preferred)	Botanical – Loss of vegetation; loss of ESA, contamination of soils; Water – Alternation of hydrology/ drainage lines, loss of riparian habitat Heritage – loss of Heritage resources Visual Dust
No-go Alternative:	Botanical – Loss of vegetation; loss of ESA, contamination of soils; Water – Alternation of hydrology/ drainage lines, loss of riparian habitat Heritage – loss of Heritage resources Visual Dust

(b) Describe the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts can be reversed; may cause irreplaceable loss of resources; and can be avoided, managed or mitigated.

The following table serves as a guide for summarising each alternative. The table should be repeated for each alternative to ensure a comparative assessment. (The EAP has to select the relevant impacts identified in blue in the table below for each alternative and repeat the table for each impact and risk).

Please refer to Appendix J2 for the comprehensive Impact Rating Matrix

Alternative 1 :	**Geology / geohydrological / ecological / socio-economic / heritage and cultural-historical / noise / visual / *etc*.**
PLANNING, DESIGN AND DEVELOPMENT PHASE	
Potential impact and risk:	
Nature of impact:	
Extent and duration of impact:	
Consequence of impact or risk:	
Probability of occurrence:	
Degree to which the impact may cause irreplaceable loss of resources:	
Degree to which the impact can be reversed:	
Indirect impacts:	
Cumulative impact prior to mitigation:	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	
Degree to which the impact can be avoided:	
Degree to which the impact can be managed:	
Degree to which the impact can be mitigated:	
Proposed mitigation:	
Residual impacts:	
Cumulative impact post mitigation:	

Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	
OPERATIONAL PHASE	
Potential impact and risk:	
Nature of impact:	
Extent and duration of impact:	
Consequence of impact or risk:	
Probability of occurrence:	
Degree to which the impact may cause irreplaceable loss of resources:	
Degree to which the impact can be reversed:	
Indirect impacts:	
Cumulative impact prior to mitigation:	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	
Degree to which the impact can be avoided:	
Degree to which the impact can be managed:	
Degree to which the impact can be mitigated:	
Proposed mitigation:	
Residual impacts:	
Cumulative impact post mitigation:	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	
Nature of impact:	
Extent and duration of impact:	
Consequence of impact or risk:	
Probability of occurrence:	
Degree to which the impact may cause irreplaceable loss of resources:	
Degree to which the impact can be reversed:	
Indirect impacts:	
Cumulative impact prior to mitigation:	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	
Degree to which the impact can be avoided:	
Degree to which the impact can be managed:	
Degree to which the impact can be mitigated:	
Proposed mitigation:	
Residual impacts:	
Cumulative impact post mitigation:	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	

Note: The EAP may decide to include this section as Appendix J to the BAR.

Please refer to Appendix J1 for the method methodology applied for the environmental impacts and risk assessment for the proposed development
Appendix J2 for the Environmental impacts and risk assessment (Impact Rating Matrix)

(c) Provide a summary of the site selection matrix.

With the correct mitigation measures in the impact significance can be summarised as the following:

Pre construction & Construction Phase:
Botanical:
Loss of Swartland Renosterveld – very low significance
Loss of Ecological Support Areas – very low significance
Soil contamination from vehicles – very low significance
Water:
Loss of riparian habitat construction of dam and associated infrastructure– very low significance
Loss of riparian habitat construction of compost storage facility (Alternative A) - very low significance
Alternation of hydrology of stream downstream of the dam wall and spillway – very low significance
Heritage:
Loss of archaeological/ palaeontological resources – very low significance

Dust – very low significance
Visual – very low significance
Noise – very low significance

Operational Phase:

Water
Alternation of hydrology of Berg river from abstraction – very low significance
Alternation of drainage line from truck compost to compost storage facility (Alternative A) – very low significance
Erosion & Sedimentation - very low significance

Dust – very low significance
Visual – very low significance
Noise – very low significance

Rehabilitation/ Decommission:
Botanical:
Soil contamination from vehicles on site – very low significance

Water:
Loss of riparian habitat – very low significance
Alternation of hydrology of surrounding streams - very low significance

Dust – very low significance
Visual – very low significance
Noise – very low significance

(d) Outcome of the site selection matrix.

It is expected that the proposed expansion will have an insignificant negative impact on the receiving environment if the correct mitigation measures as described in the risk matrix is implemented.

It is further proposed that the compost storage facility (as part of the pump house components) be constructed next to the house (Alternative A – preferred) due to ease of access and to avoid delivery trucks from unnecessarily entering the drainage line.

3. SPECIALIST INPUTS/STUDIES, FINDINGS AND RECOMMENDATIONS

Note: Specialist inputs/studies must be attached to this report as **Appendix G** and must comply with the content requirements set out in Appendix 6 of the EIA Regulations, 2014 (as amended). Also take into account the Department's Circular EADP 0028/2014 (dated 9 December 2014) on the "*One Environmental Management System*" and the EIA Regulations, 2014, any subsequent Circulars, and guidelines available on the Department's website (**http://www.westerncape.gov.za/eadp**).

Provide a summary of the findings and impact management measures identified in any specialist report and an indication of how these findings and recommendations have been included in the BAR.

The following mitigation measures/ recommendations from the specialists were included in the Environmental Management Plan (**Appendix H**) which should be complied with by the Applicant and relevant contractors. These mitigation measures were also considered while conducting the Impact significant ratings (Impact Rating Matrix) (**Appendix J).**

Recommendations on impact minimisation from the Biodiversity Impact Statement Report:

- A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase.
- Before any work is done the site and access routes must be clearly demarcated (with the aim at minimal width/smallest footprint).
- Lay-down areas or construction sites must be located within already disturbed areas or areas of low ecological value and must be pre-approved by the ECO.
- Indiscriminate clearing of areas must be avoided.
- All areas impacted as a result of construction must be rehabilitated on completion of the project.
- An integrated waste management approach must be implemented during construction.
- Use of topsoil for rehabilitation of drainage lines after construction.

Mitigation measures from the Freshwater Specialist's technical Report:

- The local irrigation board as well as the DWA has most likely already defined the schedule according to which water is to be taken from the Berg River. The DWA, according to its legal mandate, is already monitoring the Berg River water quality and water levels in terms of a long-standing national program. All that remains for Zwartfontein is to operate within the ambit of their water use license.
- The re-growth of eucalypts on the banks of the Berg River is worrisome and it would be helpful if Zwartfontein could maintain contact with Working for Water and similar initiatives. The region would benefit greatly if landowners could contribute as well to this ongoing, worth-while and large-scale undertaking.
- From time to time it may become necessary to maintain and clear the drainage lines. Although already straightened and wholly de-naturalized, it is still of concern to the DWA and other conservation authorities to protect the little ecological functioning that is still left. Maintenance should be done according to a premeditated plan, preferably in conjunction with a limnologist.
- The reeds in the drainage lines serve the purpose of trapping sediments that may come out of the orchards and vineyards during high rainfall events. Therefore, the reeds should be preserved as much as possible and allowed to re-establish following maintenance.
- Contemporary irrigation technology demands the measuring of soil moisture and irrigate accordingly. This would limit agricultural return flow.
- The pumping of seepage and return flow back into the dam is commended and should be expanded if volumes increase.
- The drainage lines above the dam are still intact, apart from the areas in the upper catchment that already has been transformed into vineyards and orchards. The natural vegetation and the drainage lines should be kept intact and not be further developed.
- The dam serves as a roost for water fowl. These birds should be monitored for disease and mortalities. Mortalities should be reported to relevant authorities.

4. ENVIRONMENTAL IMPACT STATEMENT

Provide an environmental impact statement of the following:

(i) A summary of the key findings of the EIA.

Key findings regarding Biodiversity:

From the Biodiversity Overlay Maps from Cape Farm Mapper (**Appendix D**) and the Botanical Assessment conducted by the Biodiversity Specialist (**Appendix G1**) the site falls within a small Critical Biodiversity Area

(CBA). However, the small CBA is located within the dam. The dam will also further impact Ecological Support Area Class 2 (ESA2).

According to the Vegetation map from Cape Farm Mapper, Appendix D, the vegetation that would have been present on the site is Swartland Shale Renosterveld. This type of vegetation is classified as *Critically Endangered* in terms of the *National Environmental Management: Biodiversity Act 2004, National List of Ecosystems that are threatened and in need of protection (NEMBA).*

However, The Botanical assessment concludes that the proposed dam enlargement will not impact on any remaining vegetation or plant species of significant conservation value. Most of the terrain and its immediate surroundings are considered heavily degraded to transformed, only a few indigenous species and alien pioneer species remains. No protected plant species were encountered.

Key findings regarding Freshwater resources:

According to the Freshwater Report, Appendix G2, the non-perennial stream which the Zwartfontein dam intersects, as indicated on the Water Resources Map from Cape Farm Mapper, Appendix D, is considered a drainage line as indicted in figure 7 above and figure 9 – 12 above. The drainage line is approx. 4,4k long. The drainage line upstream of the dam takes the shape of wide valleys with no discernible drainage line and with the same vegetation as elsewhere on the hill. The drainage line down-stream of the dam has been transformed into a straight agricultural return flow furrow, all the way down to its confluence with the Berg River. The drainage line is considered to be overgrown with reeds.

Drainage line PES and EIS:
The drainage line has been classified as an "E" PES. This indicates that the drainage line has been significantly altered with a loss of ecological functioning. The proposed increase in the dam wall will not change this classification and the drainage line will not deteriorate any further.

In terms of the Ecological Importance of the drainage line, according to the freshwater report, the drainage line could not be considered as ecologically important. The drainage line is devoid of permanent water, apart from irrigation return flow. There are no fish or endangered plant or animal species in die drainage line.

The freshwater report states that the Zwartfontein drainage line, would never recover if agriculture was to cease and nature was to be left to its own devices. The report uses the ability for renosterveld to recover once removed as a well-known practical example, when the vegetation is removed for the purpose of agriculture and then left to recover, the natural vegetation does not grow back. Cultivated areas all over the area and that have been left alone for 50 or even 100 years, have not recovered. Likewise, it can be expected that the Zwartfontein drainage line would not recover. In this sense it can be considered as sensitive.

Berg river PES and EIS:
The Berg river was classified as a "C" PES. It has a list/ It has lost some ecological functioning because of water quality and invasive organisms both instream, and in the riparian zone. The score is better than the "D" score downstream, where the river is heavily overgrown with Eucalypts. According to the report, the better score can be attributes to the lack of return flow at the end if the dry season, later summer. The score was elevated by the removal of alien invasive vegetation removal campaign. Carp dominated instream habitat.

The Berg river qualifies as Ecologically Important due to the potential presence of two species on the Red Data List. These include Red fin minnows (*Pseudibarbus burgeri)* and white fish (*Barbus andrewi*), as listed by the IUCN as endangered. Capa galaxuias and Red fin minnows can be expected in the upper reaches of the watershed rather than at Zwartfontein. White fish (*Barbus andrewi*), could have been present some time ago and could have been decimated by the introduction of exotic and predarory small mouth black bass (*Micropterus dolomieu*) and trout. The Zwartfontein habitat has been taken over by carp (*Cyrinus carpio*)

According to the freshwater report, the Berg River at Zwartfontein has absorbed numerous and deep-cutting human impacts, yet is still functions as an aquatic ecosystem. In the highly improbable event of ceased human

impact, the river here would probably bounce back to its previous glory. In this respect the river cannot be categorised as sensitive. It was pleasing to note the recovery of the riparian zone during the site visit. It still has a very long way to go if it were to resemble anything like the original vegetation. This would probably not happen for many decades and in this respect the riparian zone can be described as sensitive.

The freshwater report concludes that the existing legal water use is already fully utilised for irrigation and has already been discounted by the DWS against ecological flow requirements of the Berg river, and the proposed extra storage capacity would not alter the situation. However, with large irrigation schemes there is always the possibility of more agricultural return flow which impact the river system. However, the drainage lines have already been transformed into stormwater management systems and return flows and the enlargement of the dam will not add to these impacts

Farm dams are often regarded as habitat for aquatic organisms. However, water levels vary widely, from full when filled during winter to empty at the end of summer. This makes for an aggressive aquatic environment with limited ecological functioning. With such a large turn-over of water in the dam water quality problems are less of a problem.

Key findings regarding Heritage Resources:

The Heritage screener conducted by CTS Heritage (Appendix G3.1) concluded that no structurers with heritage significance will be impacted by the proposed enlargement of the dam. In terms of archaeological, while it may be likely that, due to its proximity to the Berg River, that archaeological resources may be located within the proposed development area, it is unlikely that these resources will be in situ due to the extensive agricultural activity that has occurred on this site. Furthermore, no impacts to significant palaeontological resources are anticipated. HWC provided comment (Appendix E2) stating that the proposed dam enlargement will not impact on heritage resources.

(ii) Has a map of appropriate scale been provided, which superimposes the proposed development and its associated structures and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers? Refer to the layout plans (**Appendix B**) and Sensitivity maps (**Appendix D**). Map to be provided.	YES	NO

(iii) A summary of the positive and negative impacts that the proposed development and alternatives will cause in the environment and community.

Positive impact associated with the proposed expansion of Zwartfontein dam:

The proposed enlargement of Zwartfontein dam would allow for the storage of irrigation water, which is usually lost. The enlargement of the dam would provide a more efficient use of water which has become a scarce resource, especially in the Western Cape. The water stored will be used for the irrigation of existing fruit orchards. Agriculture remains the backbone of the Western Cape economy and would lead to economic gains.

Another potential positive impact realised is the possible restoration of the degraded Class 2 Ecological Support Areas along drainage line. Ideally, these areas should be restored to its natural state. However, in this case, restoration will require intervention as there are no more natural vegetation left, not even riparian vegetation due to agricultural activities. It is recommended that topsoil removed from the drainage line before construction is safely stored and used for rehabilitation of the drainage line after construction.

Negative impact associated with the proposed expansion of Zwartfontein dam:

The specialists confirmed that due to past and ongoing agricultural activities, the site selected for the expansion of the dam, has already been transformed. No critical biodiversity, freshwater or heritage resources would be lost due to the expansion of Zwartfontein dam.

5. IMPACT MANAGEMENT, MITIGATION AND MONITORING MEASURES

(a) Based on the assessment, describe the impact management, mitigation and monitoring measures as well as the impact management objectives and impact management outcomes included in the EMPr. The EMPr must be attached to this report as Appendix H.

Impact management, mitigation and monitoring measures are captured in the impact assessment and significance rating, attached as Appendix J, as well as in the Environmental Management Plan/Programme (EMPr) attached as Appendix H.

The EMPr forms part of the contractual obligations to which all persons including but not limited to, contractors/sub-contractors or employees involved in construction, operation, maintenance or decommissioning work, must be committed. It also serves as a baseline information document for the project applicant and any entity working on behalf of the applicant, during the various phases of the proposed activity. The EMPr aims to comply with Section 24N of the National Environmental Management Act No. 107 of 1998, as amended (NEMA), as well as any additional specific information requested by any government department, including the regulating authority for this specific project, the DEA&DP.
The overall objective of the EMPr is to direct and guide all responsible parties, binding all contractors, sub-contractors and all other persons working on the site to adhere to the terms and conditions of the EMPr during the construction, operation, maintenance and anticipated demolition/decommissioning phases of the project.

The overall outcome of the EMPr is to prevent avoidable damage and/or minimise or mitigate unavoidable environmental damage associated with the construction, operation, maintenance and possible decommissioning phases of the proposed project.

The specific outcomes of the EMPr will be achieved through ensuring that the mitigation and management measures detailed in the EMPr are implemented and adhered to throughout the project duration.

Compliance monitoring and independent assessment/auditing allow the verification of achievement of the EMPr outcomes and ultimately, fulfilment of the EMPr objectives.

The EMPr is partly prescriptive (identifying specific people or organisations to undertake specific tasks, in order to ensure that impacts on the environment are minimised) but it is also a dynamic, evolving document, in that information gained during the various activities and/or monitoring of procedures on site, could lead to changes in the EMPr.

The EMPr:

- identifies project activities that could cause actual environmental damage (or potential environmental risks) and provides a summary of actions required;
- identifies persons responsible for ensuring compliance with the EMPr;
- provides standard procedures to avoid and/or minimise the identified negative environmental impacts and to enhance the positive impact of the project on the environment;
- provides site and project specific rules and actions required, including a site plan/s showing:
    - areas where construction, maintenance, or demolition work may be carried out;
    - areas where any material or waste may be stored;
    - allowed access routes, parking and turning areas for construction or construction related vehicles;

- forms a written record of procedures, responsibilities, requirements and rules for contractor/s, their staff and any other person who must comply with the EMPr;
- provides a monitoring and auditing programme to track and record compliance and identify and respond to any potential or actual negative environmental impacts; and
- provides a monitoring programme to record any mitigation measures that are implemented

The following aims to give a high level summary of potential impacts, objectives and mitigation measures as captured in the EMPr:

Objective 1: Maintain a healthy biodiversity environment:

Potential Impacts:

- Further loss of Ecological Support Areas Class 2 (ESA2s)
- Soil contamination from construction

The following mitigation/ monitoring measure can be implemented to reduce these impact and ultimately achieve Objective 1:

- A suitably qualified ECO must be appointed;
- Environmental Awareness training to be conducted with all workers
- Ensure construction activities are restricted to the demarcated footprint, strictly prohibit any vehicles or construction related activities outside of the demarcated footprint area
- Access roads to the dam should be limited to a single circular route in and out. Ensure construction vehicles stay on existing roads and erect signs to remind workers not to deviate from the roads.
- No concrete will be mixed on site and surplus must be disposed of in the correct manner.
- Inspect all vehicles daily for the early detection of deterioration or leaks.
- The contractor should ensure drip trays are placed under stationary vehicles.
- Spill kits must be available. Workers should be trained how to use spill kits to rectify a spill immediately. Records must be kept of any spills.
- Portable toilets must be placed no less than 32m form any watercourse/ stream and serviced regularly in order to prevent leakage/spillage. No portable toilets to be placed in watercourse 1 where the weir it to be rehabilitated.
- Lay-down areas or construction sites must be located within already disturbed areas or areas of low ecological value and must be pre-approved by the ECO.
- Indiscriminate clearing of areas must be avoided.
- All alien plants must be removed from within the construction footprint and immediate surroundings.
- All areas impacted as a result of construction must be rehabilitated on completion of the project.
- An integrated waste management approach must be implemented during construction.
- Ideally ecological support areas should be established along the small streams. As a potential off-set the re-establishment and protection (fencing them off) of a more natural riparian vegetation along these steams should be considered. But this will be difficult as the area has been subject to intensive agriculture over a long period of time.

Objective 2: Protection of Freshwater resources:

Potential Impacts:

- Loss of riparian habitat
- Further degradation of the river systems
- Erosion and sedimentation

The following mitigation/ monitoring measure can be implemented to reduce these impact and ultimately achieve Objective 2:

- A suitably qualified ECO must be appointed;
- Environmental Awareness training to be conducted with all workers
- Ensure construction activities are restricted to the demarcated footprint, strictly prohibit any vehicles or construction related activities outside of the demarcated footprint area
- Access roads to the dam should be limited to a single circular route in and out. Ensure construction vehicles stay on existing roads and erect signs to remind workers not to deviate from the roads.
- No concrete/ cement will be mixed on site and surplus must be disposed of in the correct manner.
- Inspect all vehicles daily for the early detection of deterioration or leaks.
- The dam and the spillway should be not any higher than the dam's full capacity, after the 182 000m3 has been added to the capacity of the dam. This would ensure that if the dam is at its design capacity, it would overflow during exceptional very high rainfall events.
- During construction its footprint should be kept as small as possible;
- All building rubble should be removed following the completion of the dam;
- No building rubble should be allowed to wash into the stream;
- Building should take place during the dry summer months
- Monitor areas below the dam wall (at the spillway) after heavy rainfall events for erosion and sedimentation.
- Should erosion and incision be noted, immediate corrective measures must be undertaken.
- Erosion at the spillway can be prevented by using rip-rap mattresses or spreaders.
- Nuisance vegetation and sedimentation to be removed to ensure overflow;
- Rehabilitation measures may include the filling of erosion gullies and rills, and the stabilization of gullies with silt fences.

Objective 3: Prevent the loss of any heritage resources

Potential Impact : Loss of paleontological or archaeological resources

The following mitigation/ monitoring measure can be implemented to reduce these impact and ultimately achieve Objective 3:

- A suitably qualified ECO must be appointed;
- Environmental Awareness training to be conducted with all workers
- Ensure construction activities are restricted to the demarcated footprint, strictly prohibit any vehicles or construction related activities outside of the demarcated footprint area
- Access roads to the dam should be limited to a single circular route in and out. Ensure construction vehicles stay on existing roads and erect signs to remind workers not to deviate from the roads.
- In the case of any significant new fossil finds exposed during dam construction (e.g. concentrations of well-preserved fossil shells such as "starfish beds"), these should be safeguarded - preferably in situ - and reported by the ECO as soon as possible to Heritage Western Cape (Att: Mr Andrew September 021 483 9543).
- All construction within a radius of at least 20m of the indicator should cease. This distance should be increased at the discretion of supervisory staff if heavy machinery or explosives could cause further disturbance to the suspected heritage resource.
- This area must be marked using clearly visible means, such as barrier tape, and all personnel should be informed that it is a no-go area.
- The grave (Site 665) must be fenced off prior to site preparation commencing. Alternatively, a buffer of 30m must be established around the site, which includes the modern kraal (Site 664).
- A guard should be appointed to enforce this no-go area if there is any possibility that it could be violated, whether intentionally or inadvertently, by construction staff or members of the public.
- No measures should be taken to cover up the suspected heritage resource with soil, or to collect any remains such as bone, ceramics or stone.

- If a heritage practitioner has been appointed to monitor the project, s/he should be contacted and a site inspection arranged as soon as possible.
- All parties concerned should respect the potentially sensitive and confidential nature of the heritage resources, particularly human remains, and refrain from making public statements until a mutually agreed time.
- Any extension of the project beyond its current footprint involving vegetation and/or earth clearance should be subject to prior assessment by a qualified heritage practitioner, taking into account all information gathered during this initial heritage impact assessment.
- We recommend the appointment of a Stone Age Specialist if any large finds of stone tools are discovered during construction.

Any potential unforeseen impacts are covered in the EMPr (**Appendix H**) which should be implemented.

(b) Describe any provisions for the adherence to requirements that are prescribed in a Specific Environmental Management Act relevant to the listed activity or specified activity in question.

- Compliance with the Environmental Management Program (**Appendix H**) must be mandatory; and
- Appointment of an Environmental Control Officer during the construction phase;
- A rehabilitation plan/ method statement must be agreed upon and signed doff by the ECO
- Provisions must be made for rehabilitation.

(c) Describe the ability of the applicant to implement the management, mitigation and monitoring measures.

Under South African environmental legislation, the Applicant is accountable for the potential impacts of the activities that are undertaken and is responsible for managing these impacts.

The Applicant therefore has overall and total environmental responsibility to ensure that the implementation of the construction phase of this EMP complies with the relevant legislation and the conditions of the environmental authorisation.

The Applicant will be responsible for the development and implementation of the conditions of the Environmental Authorisation in terms of the design of the development and construction thereof. The developer will thus be responsible for the implementation of this EMP.

The applicant has shown commitment to implement management, mitigation and monitoring measures as specified in the recommendations in and the EMP.

(d) Provide the details of any financial provisions for the management of negative environmental impacts, rehabilitation and closure of the proposed development.

Provisions must be made available for rehabilitation. A rehabilitation plan method statement must be singed off by the ECO and the rehabilitation must occur after construction.
More information regarding financial provisions to be included.

(e) Provide the details of any financial provisions for the management of negative environmental impacts, rehabilitation and closure of the proposed development.

Please refer to (d) above. More information to be provided.

(f) Describe any assumptions, uncertainties, and gaps in knowledge which relate to the impact management, mitigation and monitoring measures proposed.

The following assumptions are made:

- The information on which the report is based (i.e. project information) is correct.
- The construction and management of this proposed development will be in line with the recommendations in this report, which will be enforced by the implementation of detailed Environmental Management Plan. Much of the long-term success lies in the effective implementation of the measures prescribed in the Environmental Management Plan.

There are no significant gaps of knowledge that have been identified.

There are no uncertainties that we are aware of at present.

SECTION H: RECOMMENDATIONS OF THE EAP AND SPECIALISTS

(a) In my view as the appointed EAP, the information contained in this BAR and the documentation attached hereto is sufficient to make a decision in respect of the listed activity(ies) applied for.	YES	~~NO~~

(b) If the documentation attached hereto is sufficient to make a decision, please indicate below whether, in your opinion, the listed activity(ies) should or should not be authorised:		
Listed activity(ies) should be authorised:	YES	~~NO~~

Provide reasons for your opinion

The proposed expansion ofZwartfontein Dam should be authorised for the following reasons

- The botanical specialist states that site and its immediate surrounding are considered transformed with no natural veld remaining. Only a few hardy (weedy) indigenous species remains, no protected species will be lost.
- With the proposed dam expansion the potential to restore degraded ESA associates with the drainage line realised;
- The Freshwater specialist states that the increase of the dam will not cause a further impact in the Berg river or drainage line.
- The dam enlargement will not impact on Heritage Resources.
- The proposed expansion of Zwartfontein is not expected to have any adverse effects on people's health and well-being.
- It is also not expected to produce any unacceptable noise or odours during the construction or operational phases.
- The proposed expansion of the dam, is not expected to have any significant negative impact on the visual character of the area.
- The proposed development will result in better utilisation of an existing water use right and provide insurance of water supply for the irrigation of fruit orchards, strengthening the agricultural sector, the backbone of the Western Cape Economy contributing to positive social-economic spin offs.
- Properly managed and designed farm dams can attract a variety of bird, insect and animals to the area and so contribute to conservation of biodiversity.

Considering all the information, it is not envisaged that the proposed dam expansion pose any significant negative impact on the environment, while it is likely to result in a positive socio-economical outcome.

It is therefore recommended that this application be authorised with the necessary conditions of approval as described throughout this BAR.

(c) Provide a description of any aspects that were conditional to the findings of the assessment by the EAP and Specialists which are to be included as conditions of authorisation.

In terms of the compost storage facility:

- It is proposed that the compost storage facility is constructed next to the house (Alternative A(, duet to ease of access and to avoid large delivery trucks from unnecessarily entering the drainage line when delivering compost
- This storage facility will store up to maximum 80 000L or 80m³ of compost and comprise off a cement slab with walls with no roof to contain any possible spills. The storage facility must comply to National Norms and Standards for the storage of Waste in terms of the National Environmental Management: Waste Act (Act No. 59 of 2008).

In terms of Heritage Resources:

- Should any heritage resources, including evidence graves and human burials, archeologically material and paleontological material be discovered during the execution of the activities above, all works must be stopped immediately and HWC must be notified without delay.

In terms of agricultural return flow:

- Contemporary irrigation technology demands the measuring of soil moisture and irrigate accordingly. This would limit agricultural return flow.
- The pumping of seepage and return flow back into the dam is commended and should be expanded if volumes increase.

Drainage line:

- The drainage lines above the dam are still intact, apart from the areas in the upper catchment that already has been transformed into vineyards and orchards. The natural vegetation and the drainage lines should be kept intact and not be further developed.
- Topsoil removed during site clearing from drainage lines must be stored and used for rehabilitation.

(d) If you are of the opinion that the activity should be authorised, please provide any conditions, including mitigation measures that should in your view be considered for inclusion in an environmental authorisation.

A suitably qualified ECO should be appointed to oversee the project.
Recommendations as set out by the specialists and captured in the EMPr should be adhered to at all times.
A rehabilitation plan should be agreed upon and implemented after construction.

(e) Please indicate the recommended periods in terms of the following periods that should be specified in the environmental authorisation:

i.	the period within which commencement must occur;	Upon granting of the EA and WUL construction must occur within 2 years. To be confirmed.
ii.	the period for which the environmental authorisation is granted and the date on which the development proposal will have been concluded, where the environmental authorisation does not include operational aspects;	Construction of phase 1 is expected to take a period of 6 months. The EA should be granted for the maximum of 5 years. To be confirmed.
iii.	the period for which the portion of the environmental authorisation that deals with non-operational aspects is granted; and	N/A
iv.	the period for which the portion of the environmental authorisation that deals with operational aspects is granted.	N/A

SECTION I: APPENDICES

The following appendices must be attached to this report:

APPENDIX			Confirm that Appendix is attached
Appendix A:	**Locality map**		Yes
Appendix B:	**Site development plan(s)**		Yes
	A map of appropriate scale, which superimposes the proposed development and its associated structures and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffer areas;		No To be provided
Appendix C:	**Photographs**		Yes
Appendix D:	**Biodiversity overlay map**		Yes
Appendix E:	**Permit(s) / license(s) from any other Organ of State, including service letters from the municipality.**		Yes
	Appendix E1:	**Copy of comment from HWC.**	Yes
Appendix F:	**Public participation information: including a copy of the register of I&APs, the comments and responses report, proof of notices, advertisements and any other public participation information as is required in Section C above.**		Yes
Appendix G:	**Specialist Report(s)**		Yes
Appendix H :	**EMPr**		Yes
Appendix I:	**Additional information related to listed waste management activities (if applicable)**		N/A
Appendix J:	**If applicable, description of the impact assessment process followed to reach the proposed preferred alternative within the site.**		Yes
Appendix K:	**Any Other (if applicable).** **Sarel Bester Ingenieurs BK Preliminary Design Reports: 1731DOV-S2** (for Phase 1) **and 1731DOV-S2(Rev1)** (for Phase 2)**.**		Yes
Appendix L:	**CVs**		Yes

SECTION J: DECLARATIONS

THE APPLICANT

Note: Duplicate this section where there is more than one applicant.

I ……..……., in my personal capacity or duly authorised thereto, hereby declare/affirm all the information submitted as part of this Report is true and correct, and that I –

- am aware of and understand the content of this report;
- am fully aware of my responsibilities in terms of the NEMA, the EIA Regulations in terms of the NEMA (Government Notice No. R. 982, refers) (as amended) and any relevant specific environmental management Act and that failure to fulfil these requirements may constitute an offence in terms of relevant environmental legislation;
- have provided the EAP and Specialist, Review EAP (if applicable), and Review Specialist (if applicable), and the Competent Authority with access to all information at my disposal that is relevant to the application;
- will be responsible for complying with conditions that may be attached to any decision(s) issued by the Competent Authority;
- will be responsible for the costs incurred in complying with the conditions that may be attached to any decision(s) issued by the Competent Authority;

Note: If acting in a representative capacity, a certified copy of the resolution or power of attorney must be attached.

Signature of the Applicant: _____

Name of Organisation: _____

Date: _____

THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

I ……., as the appointed EAP hereby declare/affirm:

- the correctness of the information provided as part of this Report;
- that all the comments and inputs from stakeholders and I&APs have been included in this Report;
- that all the inputs and recommendations from the specialist reports, if specialist reports were produced, have been included in this Report;
- any information provided by me to I&APs and any responses by me to the comments or inputs made by I&APs;
- that I have maintained my independence throughout this EIA process, or if not independent, that the review EAP has reviewed my work (Note: a declaration by the review EAP must be submitted);
- that I have throughout this EIA process met all of the general requirements of EAPs as set out in Regulation 13;
- I have throughout this EIA process disclosed to the applicant, the specialist (if any), the Department and I&APs, all material information that has or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared as part of the application;
- have ensured that information containing all relevant facts in respect of the application was distributed or was made available to I&APs and that participation by I&APs was facilitated in such a manner that all I&APs were provided with a reasonable opportunity to participate and to provide comments;
- have ensured that the comments of all I&APs were considered, recorded and submitted to the Department in respect of the application;
- have ensured the inclusion of inputs and recommendations from the specialist reports in respect of the application, if specialist inputs and recommendations were produced;
- have kept a register of all I&APs that participated during the PPP; and
- am aware that a false declaration is an offence in terms of Regulation 48 of the EIA Regulations, 2014 (as amended).

Signature of the EAP: _____

Name of Company: _____

Date: _____

THE REVIEW ENVIRONMENTAL ASSESSMENT PRACTITIONER

I ……, as the appointed Review EAP hereby declare/affirm:

- that I have reviewed all the work produced by the EAP;
- the correctness of the information provided as part of this Report;
- that I have, throughout this EIA process met all of the general requirements of EAPs as set out in Regulation 13;
- I have, throughout this EIA process disclosed to the applicant, the EAP, the specialist (if any), the review specialist (if any), the Department and I&APs, all material information that has or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared as part of the application; and
- am aware that a false declaration is an offence in terms of Regulation 48 of the EIA Regulations, 2014 (as amended).

Signature of the Review EAP: _____

Name of Company: _____

Date: _____

THE SPECIALIST

Note: Duplicate this section where there is more than one specialist.

I ……, as the appointed Specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I :

- in terms of the general requirement to be independent:
  - other than fair remuneration for work performed in terms of this application, have no business, financial, personal or other interest in the development proposal or application and that there are no circumstances that may compromise my objectivity; or
  - am not independent, but another specialist (the "Review Specialist") that meets the general requirements set out in Regulation 13 has been appointed to review my work (Note: a declaration by the review specialist must be submitted);
- in terms of the remainder of the general requirements for a specialist, have throughout this EIA process met all of the requirements;
- have disclosed to the applicant, the EAP, the Review EAP (if applicable), the Department and I&APs all material information that has or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application; and
- am aware that a false declaration is an offence in terms of Regulation 48 of the EIA Regulations, 2014 (as amended).

Signature of the Specialist: _____

Name of Company: _____

Date: _____

THE REVIEW SPECIALIST

I ……., as the appointed Review Specialist hereby declare/affirm:

- that I have reviewed all the work produced by the Specialist(s);
- the correctness of the specialist information provided as part of this Report;
- that I have, throughout this EIA process met all of the general requirements of specialists as set out in Regulation 13;
- I have, throughout this EIA process disclosed to the applicant, the EAP, the review EAP (if applicable), the Specialist(s), the Department and I&APs, all material information that has or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared as part of the application; and
- I am aware that a false declaration is an offence in terms of Regulation 48 of the EIA Regulations, 2014 (as amended).

Signature of Review Specialist: _____

Name of Company: _____

Date: _____