ENVIRONMENTAL IMPACT REPORT: THE PROPOSED ESTABLISHMENT OF A WATER STORAGE DAM ON PORTIONS 101 AND 168 OF THE FARM MELKBOOM NO. 384, VANRHYNSDORP

October 2023

Prepared for: Cederberg Farming (Pty) Ltd
P. O. Box 50
TRAWAL
8147

Contact person: J. Tredoux
E-mail: j.tredoux@cederbergfarming.com

Prepared by: EnviroAfrica CC
P. O. Box 5367
HELDERBERG
7135

Contact person: Bernard de Witt
E-mail: Bernard@enviroafrica.co.za

INDEPENDENCE & CONDITIONS

EnviroAfrica is an independent consulting firm that has no interest in the proposed activity other than fair remuneration for services rendered. Remuneration for services is not linked to approval by decision-making authorities and EnviroAfrica has no interest in secondary or downstream development as a result of this project. There are no circumstances that compromise the objectivity of this Environmental Impact Report. The findings, results, observations and recommendations given here are based on the author's best scientific and professional knowledge and available information. EnviroAfrica reserves the right to modify aspects of this report, including the recommendations if new information becomes available which may have a significant impact on the findings of this report.

RELEVANT QUALIFICATIONS & EXPERIENCE OF THE EAP

This Environmental Impact Report was prepared by Bernard de Witt, who has more than 30 years of experience in environmental management and environmental impact assessments.

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 of the Western Cape Province.

For the last four years of his employment, he assessed and evaluated development applications, from an environmental perspective, on behalf of CNC (now Western Cape Department of Environmental Affairs and Development Planning ("DEA&DP")). Since he left the DEA&DP, he has been involved in environmental consulting in the private sector as a member of EnviroAfrica.

Please refer to **Appendix 2O** for the CV of the EAP.

ADMINISTRATIVE DETAILS

Highlight the Departmental Region in which the intended application will fall	CAPE TOWN OFFICE:		GEORGE OFFICE:
	REGION 1 (City of Cape Town, West Coast District	~~REGION 2~~ ~~(Cape Winelands District & Overberg District)~~	~~REGION 3~~ ~~(Central Karoo District & Garden Route District)~~
Duplicate this section where there is more than one Proponent Name of Applicant/Proponent:	Cederberg Farming Trawal (Pty) Ltd		
Name of contact person for Applicant/Proponent (if other):	Jaco Tredoux		
Company/ Trading name/State Department/Organ of State:	Cederberg Farming Trawal Pty (Ltd)		
Company Registration Number:			
Postal address:	P. O. BOX 50		
	TRAWAL	Postal code: 8147	
Telephone:	(021) 421 2129	Cell: 083 645 5664	
E-mail:	j.tredoux@cederbergfarming.com	Fax:	
Company of EAP:	EnviroAfrica CC		
EAP name:	Bernard de Witt		
Postal address:	P. O. Box 5367		
	HELDERBERG	Postal code: 7130	
Telephone:		Cell: 082 448 9991	
E-mail:	bernard@enviroafrica.co.za	Fax: (086) 512 0154	
Qualifications:	B.A. (Hons) Public Administration (Stellenbosch); National Diploma in Parks and Recreation Management; EIA Short course (UCT); ISO 14001 Auditors course (SABS); EAPASA Registration 2021/3903		
EAPASA registration no:			
Duplicate this section where there is more than one landowner Name of landowner:	Same as Applicant		
Name of contact person for landowner (if other):			
Postal address:			
		Postal code:	
Telephone:	( )	Cell:	
E-mail:		Fax: ( )	
Name of Person in control of the land:	Same as Applicant		
Name of contact person for person in control of the land:			
Postal address:			
		Postal code:	
Telephone:	( )	Cell:	
E-mail:		Fax: ( )	

Duplicate this section where there is more than one Municipal Jurisdiction Municipality in whose area of jurisdiction the proposed activity will fall:	Matzikama Local Municipality	
Contact person:	Thesme van Zyl	
Postal address:	37 Church Steet	
	VREDENDAL	Postal code: 8160
Telephone	(027) 201 3351/02	Cell:
E-mail:	thesme@matzikama.gov.za	Fax:

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ACRONYMS

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

1. INTRODUCTION

1.1 BACKGROUND

Cederberg Farming Trawal (Pty) Ltd proposes to establish a water storage dam of approximately 92 000m^3 on Portion 101 and Portion 168 of the Farm Melkboom No. 384, Vanrhynsdorp. The proposed dam will be located within 32m of the right bank of the Olifants River and supplied with water from the Bulshoek Dam Canal in terms of an existing lawful water use allocation that cannot yet be fully utilised as a result of insufficient water storage capacity in the existing on-site farm dams. The storage of water in the proposed dam will bring the applicant closer to fully utilising the existing lawful water use allocated to the applicant and make the applicant's farming operations less vulnerable to droughts.

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Table 1: Features of the proposed dam

Location	31°52' 02.4"S 18°37' 48.0"E
Option:	**Preferred**
Wall crest level (masl)	31.0
Full supply level (masl)	30.0
Lowest ground level (masl)	23.0
Max wall height (m)	8.0
Crest length (m)	441
Crest width (m)	4.0
Upstream slope	1 : 3
Downstream slope	1 : 2
Free board (m)	1.0
Embankment volume (m³)	33 100
Storage capacity (m³)	±92 000
Water surface area (ha)	±2.3
Embankment footprint (ha)	±1.1

The applicant, Cederberg Farming Trawal (Pty) Ltd has appointed EnviroAfrica CC to be the independent Environmental Assessment Practitioner ("EAP") company that manages the process of applying for environmental authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA").

The Scoping Report and the Plan of Study for the Environmental Impact Reporting phase were accepted by the Western Cape Department of Environmental Affairs and Development Planning ("DEA&DP") on 05 July 2023 and the Draft Environmental Impact Report ("EIR") was made available for comment to Interested and Affected Parties ("I&APs") for more than 30 days.

Figure 1: Locality plan depicting proposed dam site

The EIR that is hereby submitted to the DEA&DP forms part of the EIA process. The purpose of the EIR is to describe the proposed development, the process followed to date, to present alternatives and to identify the potential impacts of the proposed development on the receiving environment, as well as provide recommendations and mitigation measures as suggested by the appointed specialist scientists, the EAP and other relevant parties where applicable.

1.2 DESCRIPTION OF THE PROPOSED ACTIVITY

Cederberg Farming Trawal (Pty) Ltd has proposed to establish a water storage dam of approximately 92 000m^3 capacity that will inundate a total of approximately 2.3ha of land on Portion 101 and Portion 168 of the Farm Melkboom No. 384, Vanrhynsdorp. The proposed site is located approximately 3km north-east of Trawal in the Vanrhynsdorp District and the geographic co-ordinates thereof are 31° 52' 05.40"S; 18° 37' 46.35"E.

The farm is made up of nine portions of the Farm Melkboom No. 384. These farm portions are adjacent to each other and are farmed as a single unit. The focus of production on the farm is table grapes for the export market. However, vegetables are also produced on the farm.

A portion of the proposed dam is located within 32m of the right bank of the Olifants River. Water from the Bulshoek Water Canal will be directed into the proposed dam in terms of an existing water allocation granted by the Lower Olifants River Water Users Association (“LORWUA”) and stored during the rainy winter months and for usage during the dry summer months to irrigate the vineyards and plantations on the farm via the existing irrigation canals on the farm.

The National Department of Water and Sanitation (“DWS”) has granted the Applicant a Water Use Licence in terms of Section 21 of the National Water Act, 1998 (Act No. 36 of 1998) for water to be stored in the proposed dam.

2. NEED AND DESIRABILITY

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

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

2.1 NEED

Cederberg Farming Trawal (Pty) Ltd owns nine portions of the Farm Melkboom No. 384 in the Van Rhynsdorp district near Trawal, namely Portions 72, 101, 126, 127, 128, 129, 130,168 and 205. These properties are adjacent to each other and so are farmed as a single unit.

These properties have listed water allocations under the Lower Olifants River Water User Association (LORWUA) and are irrigated with water from the Bulshoek Dam canal. However, irrigation is hampered during the dry summer months when irrigation is of utmost importance and irrigation is also hampered when maintenance work must be done on the canal. The applicant is mainly farming high-risk export produce, namely, table grapes and if the water supply becomes inadequate in situations such as drought or during canal repairs, the crops can fail during the very last few weeks that precede harvesting time.

The proposed water storage dam will help to provide a more secure supply of water for irrigation on the farm and this will make the farm a more reliable supplier of the farm's agricultural produce. In addition, the applicant anticipates that the availability of water for irrigation throughout the dry summers as a result of water that will be stored in the proposed dam will enable cultivation on the farm to be expanded at some point in the future by 5ha to 8ha, thereby strengthening the farm as an enterprise and as an employer in the rural area.

2.2 DESIRABILITY

The following factors affect the desirability of the area for the proposed development.

2.2.1 Location and Accessibility

The proposed off-stream water storage dam will be located partly on Portion 101 and partly on Portion 168 of the Farm Melkboom No. 384, Vanrhynsdorp and these land parcels form part of an existing operational farm belonging to Cederberg Farming Trawal (Pty) Ltd. Access to the farm exists via gravel roads that connect to the N7 National Road a few kilometres away. The proposed site can therefore be accessed with relative ease from a major road.

2.2.2 Compatibility with the Surrounding Area

The proposed off-stream water storage dam will be located on an existing operational farm in a rural area where similar operational farms with similar water storage dams exist. The water to be stored in the proposed dam will augment the inadequate irrigation water supplied by the two water storage dams that currently exist on the farm. The proposed off-stream storage dam will therefore blend well into the surrounding area.

3. LEGAL REQUIREMENTS

The current assessment is being undertaken with the requirements of the NEMA in mind, as well as the EIA Regulations, 2014 (as amended). However, the provisions of various other Acts must also be considered in this EIA application.

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

3.1 THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA

The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) states that everyone has the right to a non-threatening environment and that reasonable measures are applied to protect the environment. This includes preventing pollution and promoting conservation and environmentally sustainable development, while promoting justifiable social and economic development.

3.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998)

The NEMA (as amended) makes provision for the identification and assessment of activities that are potentially detrimental to the environment and which require authorisation from the relevant authorities based on the findings of an environmental assessment. The NEMA is a national Act, which is enforced nationally by the National Department of Agriculture, Forestry, Fisheries and the Environment. The power to enforce the NEMA is delegated in the Western Cape Province to the Department of Environmental Affairs and Development Planning ("DEA&DP").

On 4 December 2014 the Minister of Environmental Affairs promulgated regulations in terms of environmental impact assessments, under sections 24(5) and 44 of the NEMA, namely the EIA Regulations of 2014 (as amended). These regulations were amended in April 2017, and include:

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

Listing Notice 1 and 3 are for Basic Assessment and Listing Notice 2 is for Environmental Impact Reporting.

According to the EIA Regulations, 2014 (as amended), the Applicant must obtain environmental authorisation for the following listed activities before the proposed off-steam storage dam can be established:

Table 2: Listed activities applicable

GN No. R. 327	Description of listed activity	Description of specific portion of the development proposal that may trigger the listed activity.
Item 12.	"*The development of—* *(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or* *(ii) infrastructure or structures with a physical footprint of 100 square metres or more;* *where such development occurs—* *(a) within a watercourse;* *(b) in front of a development setback; or* *(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;* *— excluding—* *(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;* *(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;* *(cc) activities listed in Activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;* *(dd) where such development occurs within an urban area;* *(ee) where such development occurs within existing roads, road reserves or railway line reserves; or* *(ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared*".	The proposed dam will be located within 32m of the bank of the Olifants River and has a development footprint bigger than 100m^2.
Item 19	"*The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit,*	The proposed dam is located within the riparian zone of the Olifants River and extends to within 32m of

	pebbles or rock of more than 10 cubic metres from a watercourse; but excluding where such infilling, depositing, dredging, excavation, removal or moving— *(a) will occur behind a development setback;* *(b) is for maintenance purposes undertaken following a maintenance management plan;* *(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies;* *(d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or* *(e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies*".	the right bank of the River.
GN No. R. 325	**Description of listed activity**	**Description of specific portion of the development proposal that may trigger the listed activity.**
Item 16	"*The development of a dam where the highest part of the dam wall, as measured from the outside toe of the wall to the highest part of the wall, is 5 metres or higher or where the high-water mark of the dam covers an area of 10 hectares or more*".	The proposed dam will have a wall that is approximately 8m tall.

An application notice ("NOI") was submitted to the competent authority and pre-application Scoping Report. The pre-application Scoping Report was made available to I&APs for a commenting period of at least 30 days. The pre-application Scoping Process was undertaken to identify potential issues to be dealt with during the application for environmental authorisation.

An Application Form and Draft Scoping Report were submitted to the competent authority after comment had been obtained on the pre-application Scoping Report from the competent authority, commenting authorities and other I&APs. The pre-application Scoping Process was undertaken to identify potential issues to be dealt with during the application for environmental authorisation.

The principles of environmental management as set out in Section 2 of the NEMA have been considered. The said principles regarding this development proposal include, the following:

- "People and their needs must be placed at the forefront while serving their physical, psychological, developmental, cultural and social interests. The activity seeks to provide additional employment and economic development opportunities, which are a local and national need – *the proposed activity is expected to have a beneficial impact on people, especially developmental and social benefits, as well as providing additional employment and economic development opportunities".*
- "*The development will be socially, environmentally and economically sustainable. Where disturbance of ecosystems, loss of biodiversity, pollution and degradation, and landscapes and sites that constitute the nation's cultural heritage cannot be avoided, are minimised and remedied. The impact that the activity will potentially have on these will be considered, and mitigation measures will be put in place - potential impacts have been identified and considered, and any further potential impacts will be identified during the public participation process. Mitigation measures will be included in the EMPr".*

- *"Where waste cannot be avoided, it will be minimised and remedied through the implementation and adherence of the Environmental Management Programme (EMP) – this will be included in the EIR".*
- *"The use of non-renewable natural resources will be responsible and equitable".*
- *"The negative impacts on the environment and people's environmental rights will be anticipated, investigated and prevented, and where they cannot be prevented, will be minimised and remedied".*
- *"The interests, needs and values of all interested and affected parties will be taken into account in any decisions through the Public Participation Process".*
- *"The social, economic and environmental impacts of the activity will be considered, assessed and evaluated, including the disadvantages and benefits".*
- *"The effects of decisions on all aspects of the environment and all people in the environment will be taken into account, by pursuing what is deemed the best practicable environmental option*".

3.3 NATIONAL HERITAGE RESOURCES ACT

The protection and management of South Africa's heritage resources is achieved by means of enforcing the National Heritage Resources Act, 1999 (Act No. 25 of 1999). The South African National Heritage Resources Agency ("SAHRA") is the enforcing authority at national level and Heritage Western Cape ("HWC") is the enforcing agency in the Western Cape Province.

In terms of Section 38 of the National Heritage Resources Act, HWC requires a specialist assessment to be conducted where certain categories of development are proposed. Section 38(8) of the National Heritage Resources Act also makes provision for the assessment of heritage-related impacts as part of an EIA process and indicates that if such an assessment is found to be adequate, a separate specialist study is not required.

The National Heritage Resources Act requires relevant authorities to be notified regarding the proposed off-stream water storage dam, as the following is relevant to the proposed dam:

- *"any development or other activity which will change the character of a site exceeding 5000m² in extent";*

A Notice of Intent to Develop ("NID") was submitted to Heritage Western Cape (HWC) by the appointed Heritage Specialist, *i.e.*, Agency for Cultural Resource Management). Heritage Western Cape confirmed in a letter dated 09 May 2022 that the proposed development on the proposed site is unlikely to affect any heritage resources and so no further studies are required. This was confirmed again in writing on 24 March 2023 (Appendix 1D1, refers).

3.4 EIA GUIDELINE AND INFORMATION DOCUMENT SERIES

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

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

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

Moreover, the following guidelines were considered and incorporated (where applicable):

- DEADP Guidelines: The DEA&DP Guideline on Need & Desirability (2010), DEA&DP Guideline on Public Participation (2010), DEA&DP Guideline on Alternatives (2010), and DEA&DP Guideline for Environmental Management Plans (2005) were consulted and adhered to when undertaking this Basic Assessment Report.
- National Environmental Management Act (107 of 19989) (NEMA) and Environmental Impact Assessment (EIA) Regulations, 2010: Principles of environmental management, procedures to be followed and adhered to;
- Guideline on need and desirability (2017): Although some overlap with the DE&DP Guideline (2010), this guideline was consulted and adhered to with regards to considering the need and desirability aspects of the proposed dam;
- Public Participation guideline in terms of NEMA (2017): Although some overlap with the DE&ADP Guideline (2010), this guideline was consulted and adhered to with regards to considering the public participation process required for the proposed dam development;
- Impact significance, Integrated Environmental Management, Information Series 5 (2002) and Environmental Impact Reporting, Integrated Environmental Management, Information Series 15 (2004): These guidelines were consulted and adhered to with regards to the assessment of the significance of impacts associated with the proposed development of the dam.

The Protocols include the general requirements for conducting initial verification of site sensitivity. The DEA Screening Tool, as well as the nature of the proposed project (*i.e.,* development of a new dam) identified the need for certain specialist studies. The sensitivity indicated in the DEA Screening Tool, was agreed with for some Themes and disputed for other Themes and this was based on the site visit, desktop studies, and specialist assessments. Please refer to **Appendix 2I** for the Site Sensitivity Verification Report ("SSVR").

The impact mitigation hierarchy has been implemented to arrive at the best practicable environmental option. The impact mitigation hierarchy comprises four actions which are to be implemented sequentially[1], namely (1) avoidance, (2) minimization, (3) rehabilitation, and (4) offset (not applicable to this project). The following actions are relevant and have been implemented in this application in the quest to attain the best practicable environmental option:

(1) Avoidance: entailed avoiding potential environmental risks and impacts identified for the proposed development on the proposed site and surrounding area and alternatives[2] to achieve this were investigated. Avoidance was carried out in the context of this application, as environmental components that include *inter alia*, potential biodiversity and freshwater impacts) were identified and rated by specialists. Moreover, design alternatives were also investigated.

(2) Minimize potential impacts: mitigation measures[3] and recommendations have been proposed by the terrestrial biodiversity, aquatic biodiversity, and heritage specialists to mitigate and reduce

[1]Arlidge, W.N., Bull, J.W., Addison, P.F., Burgass, M.J., Gianuca, D., Gorham, T.M., Jacob, C., Shumway, N., Sinclair, S.P., Watson, J.E. and Wilcox, C., 2018. A global mitigation hierarchy for nature conservation. *BioScience*, 68(5), pp.336-347.
[2]Phalan, B., Hayes, G., Brooks, S., Marsh, D., Howard, P., Costelloe, B., Vira, B., Kowalska, A. and Whitaker, S., 2018. Avoiding impacts on biodiversity through strengthening the first stage of the mitigation hierarchy. *Oryx*, 52(2), pp.316-324.
[3]Mitigation measures and erosion control methods include, but are not limited to, silt fences, retention basins, detention ponds, interceptor ditches, seeding and sodding, riprap of exposed embankments, erosion mats, mulching, etc. Exposed areas, susceptible to erosion, must be rehabilitated. Mitigation measures are not limited to measures mentioned here as such measures may need to be adapted for site-specific maintenance. This includes planting vegetation, characteristic of the pertinent vegetation type, to stabilize the soil.

identified potential impacts. These mitigation measures and recommendations have been incorporated in the EMPr and are to be implemented during the construction and operational (where applicable) phases.

Rehabilitation: as per Action 2 above, mitigation measures, including the need to rehabilitate areas outside the construction footprint has been incorporated in the EMPr.

3.5 NATIONAL WATER ACT

In addition to the provisions of the NEMA for this EIA process, the proposed dam also requires authorization in terms of the National Water Act, 1998 (Act No. 36 of 1998).

Cederberg Farming Trawal has an Existing Water Use Right (Appendix 2K) for abstracting water from the Bulshoek Dam canal. However, the storage of water in the proposed dam requires a Water Use Licence in terms of section 21 of the National Water Act. Applicable section 21 activities include;

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

The National Department of Water and Sanitation administers the National Water Act and has issued the required Water Use Licence (Appendix 2F, refers).

In terms of Chapter 12 of the National Water Act, the proposed dam is considered a dam with a safety risk. The proposed dam therefore, requires a permit from the Dam Safety Office of the National Department of Water and Sanitation. The design and construction must conform to the conditions of the Dam Safety Regulations as set out in Government Notice R139 in Government Gazette No. 35062 of 24 February 2012. Regulations 10 and 15 apply to the proposed dam. An application for a safety classification to be specified for the proposed dam has been submitted Appendix O, refers) and a rating of Low hazard potential has been given to the proposed dam. An application for a licence to commence with the work of constructing the proposed dam will be submitted to the DWS when the application for environmental authorisation has been finalised, if it happens that the application for environmental authorisation ends with an environmental authorisation being granted by the competent authority.

3.6 NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT

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

4. ALTERNATIVES

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

4.1 SITE ALTERNATIVES

The proposed site consists of Portion 101 and Portion 168 of the Farm Melkboom No. 384, Vanrhynsdorp and these are the only farm portions out of the nine farm portions owned by Cederberg Farming Trawal (Pty) Ltd that have been considered for the proposed off-stream water storage dam. These are the only farm portions considered, as these farm portions are close to the western bank of the Olifants River where the topography is relatively flat and therefore more suitable for establishing the proposed dam. In addition, locating the proposed dam closer to the right bank of the Olifants River allows for more of the agricultural land located outside the inundation zone to remain available for optimal cultivation.

4.2 ACTIVITY ALTERNATIVES

The only activity alternative that the applicant has considered is the establishment of an off-stream dam to store water that will augment the water supply that the applicant uses for irrigation.

The applicant has a water allocation from the Lower Olifants River Water Users Association that is supplied via the Bulshoek Dam canal. A large percentage of the water that the applicant is allowed to use from the canal cannot be used by the applicant, as the applicant does not have adequate water storage capacity in the existing dams on the farm to store the required amounts of water when water is abundant during the rainy winter season. The proposed off-stream dam will enable the applicant to store a higher percentage of the water supplied via the canal and this will provide the applicant with a more reliable supply of water for irrigation during the dry summers.

The additional water storage capacity on the farm as a result of the proposed dam will enable the applicant at some point in the future to consider expanding operations on the farm by an estimated 5ha to 8ha.

The proposed off-stream storage dam is the only activity alternative considered, as an instream water storage dam in the Olifants River would cause much more significant impacts to the river ecosystem and would result in much higher financial costs for the applicant than the proposed off-stream dam. The proposed off-stream storage dam is therefore deemed the most feasible activity alternative.

4.3 DESIGN ALTERNATIVES

The appointed project engineers investigated three design alternatives for the proposed dam and the design alternatives are described in detail in Appendix 2B and 2C of the Draft EIR. The design alternatives entail the proposed dam in different sizes and shapes and at slightly varying distances from the right bank of the Olifants River as shown on Page 29 to 31 in the Engineering Designs Report attached hereto as Appendix 2C. The alternatives are also described in the table below.

Table 3**:** Specifications for the different dam design options

	Option 1: (beyond 32m from riverbank)	Option 2- Preferred option: (within 32m of riverbank)	Option 3 (beyond 32m from riverbank)
Max wall height (m)	7	8	8
Crest length (m)	320	440	375
Total earthworks (m^3)	24 400	33 100	37 700
Storage capacity (m^3)	71 000	92 000	93 000
Flooded area (ha)	2.5	2.3	2.6
Storage: Earthworks	2.91	2.78	2.47
Estimated Cost (R)	R2 973 000	R3 420 000	R3 880 000

It is evident in Table 3 above that establishing the proposed dam in line with Design Alternative No. 2 (depicted on Page 30 in Appendix 2C) costs only a little more than for Design Alternative No. 1 (depicted on Page 29 in Appendix 2C). However, the water storage capacity of Design Alternative No. 2 is significantly higher than that of Design Alternative No. 1. It is therefore more desirable to establish the proposed dam in line with Design Alternative No. 2 instead of Design Alternative No. 1.

The cost of establishing the proposed dam in line with Design Alternative No. 3 (depicted on Page 31 in Appendix 2C) is a little higher than for Design Alternative No. 2 and the water storage capacity for Design Alternative No. 3 is also a little higher than for Design Alternative No. 2. Considering that the water storage capacity in Design Alternative No. 2 is sufficient for Cederberg Farming Trawal (Pty) Ltd and is less costly than Design Alternative No. 3, Design Alternative No. 2 is more desirable than Design Alternative No. 3.

In addition, Design Alternative No. 2 results in the proposed dam being located closer to the right bank of the Olifants River than in the case of Design Alternative No. 1 and Design Alternative No. 3. In this way, Design Alternative No. 2 limits the inundation zone to a portion of the farm closer to the Olifants River than in the case of Design Alternative No. 1 and Design Alternative No. 3 and allows more land to remain available for cultivation on the farm than in the case of Design Alternative No. 1 and Design Alternative No. 3. This is therefore another advantage of Design Alternative No. 2 over Design Alternative No. 1 and Design Alternative No. 3.

It is evident that Design Alternative No. 2 strikes the best balance between the need to satisfy the water security requirements of the Applicant and the need to contain the financial costs of the applicant as well as the need to keep as much land available for cultivation on the farm as is feasible. This makes Design Alternative No. 2 the most desirable design alternative for the proposed dam. Design Alternative No. 1 and Design Alternative No. 3 have therefore been abandoned in favour of Design Alternative No. 2.

The establishment of the proposed dam will be achieved with the resulting ecological impacts remaining similarly low for all of the three design alternatives due to the implementation of the impact mitigation measures specified in the EMPr, as the proposed site for all the design alternatives has been transformed by repeated ploughing over the generations and by terracing. In addition, it is required in the EMPr regardless of the dam design alternative, that indigenous vegetation be planted and maintained on the dam wall and that a long-term alien plant clearing program be implemented between the proposed dam and the Olifants River so that indigenous vegetation can prosper in the riparian area.

In light of the above, Design Alternative No. 2 is the best practicable environmental option and is the Preferred Alternative.

4.4 NO-GO ALTERNATIVE

This is the option of not proceeding with the proposed development.

The implementation of the "no-go" alternative will not directly cause any negative environmental impacts. However, implementing the "no-go" alternative means that the applicant will remain able to only use approximately 112 000m^3 of water from the Bulshoek Dam Canal for operations on the farm, despite the LORWUA granting the applicant a water allocation of approximately 363 630m^3 for the 2022/2023 water year. This means that approximately 159 630m^3 of the 363 630m^3 of water that is lawfully available to the applicant will continue to flow downriver unused as a result of the applicant lacking a dam in which to store the water.

It is noteworthy that the applicant faces a yearly risk of crop failure when the water supply for irrigation becomes very low in summer during the last few weeks that precede harvesting time.

If the no-go alternative is adopted, the applicant will unnecessarily continue to face the risk every year, despite the LORWUA granting the applicant an allocation of water that is sufficient to minimise the risk and the competent authority can authorise the establishment of the proposed dam without any significant environmental impacts arising from the establishment of the proposed dam.

In addition to limiting the yearly risk of crop failure caused by water shortages, the water that will be stored in the proposed dam will enable the applicant to look into the possibility of expanding operations on the farm at some point in the future by 5ha to 8ha. This would significantly increase the viability of the farm as an enterprise and would result in greater job security for the employees of the farm and the families of the farm employees would in turn enjoy the socio-economic benefits thereof.

In light of the above, the no-go- alternative is undesirable and should be discarded and the Preferred Alternative authorised by the competent authority.

5. SITE DESCRIPTION

5.1 LOCATION

The proposed off-stream storage dam will be located near the right bank of the Olifants River on Portion 101 and Portion 168 of the farm Melkboom No. 384, Vanrhynsdorp in the jurisdictional

area of the Matzikama Local Municipality (See Figure 2). The total area to be inundated by the proposed dam is approximately 2.3ha. The proposed site is located approximately 3km north-east of Trawal and the geographic coordinates thereof are: 31° 52' 05.40"S, 18° 37' 46.35"E.

Access to the farm and proposed site exists via gravel roads that connect to the N7 National Road

Figure 2: Aerial view of the proposed site (shaded red) and the surrounding farm portions

5.2 VEGETATION

According to the 2018 version of the Vegetation Map of South Africa, Lesotho and Swaziland (Mucina and Rutherford, 2006), the site is located within an area that historically would have been covered by Vanrhynsdorp Gannabosveld with Namaqualand Riviere vegetation dominating the riparian zone of the Olifants River (See Figure 3). Both these vegetation types are classified as “Least Threatened” in terms of the “*List of ecosystems that are threatened and in need of protection*” (GN 1002, December 2011), promulgated in terms of the National Environmental Management Act, Biodiversity Act, 2004 (Act No. 10 of 2004).

Figure 3: Vegetation types around proposed site

Vanrhynsdorp Gannabosveld is part of the Succulent Karoo Biome (Mucina & Rutherford, 2006). The Succulent Biome vegetation is strongly influenced by winter rainfall and fog and has been compared to a desert rich in succulents. According to the 2004 National Spatial Biodiversity Assessment ("NSBA"), approximately 79% of the Vanrhynsdorp Gannabosveld vegetation remains, with the main reasons for the transformation of the remainder being cultivation and open-cast gypsum mining. A conservation target of 28% has been set for this vegetation type (none of which was formally conserved during 2004), but with the recent proclamation of the Knersvlakte Nature Reserve, at least some of this vegetation type will be formally conserved. The 2004 NSBA originally classified this vegetation type as vulnerable. However, with more information now available, it was declassified to "**Least Threatened**" in the *National list of ecosystems that are threatened and in need of protection* (GN 1002, December 2011).

A Biodiversity Compliance Statement has been compiled by the terrestrial biodiversity specialist, Mr Peet Botes of PB Consult. The findings and recommendations contained in the Botanical Compliance Statement are dealt with in detail in Section 10 the EIR.

5.3 CRITICAL BIODIVERSITY AND ECOLOGICAL SUPPORT AREAS

According to the WCBSP of 2017, the north-western portion of the proposed dam is located within an aquatic Ecological Support Area ("ESA") of Class 2 that is associated with the Olifants River and a terrestrial ESA2 (See Figure 4 below).

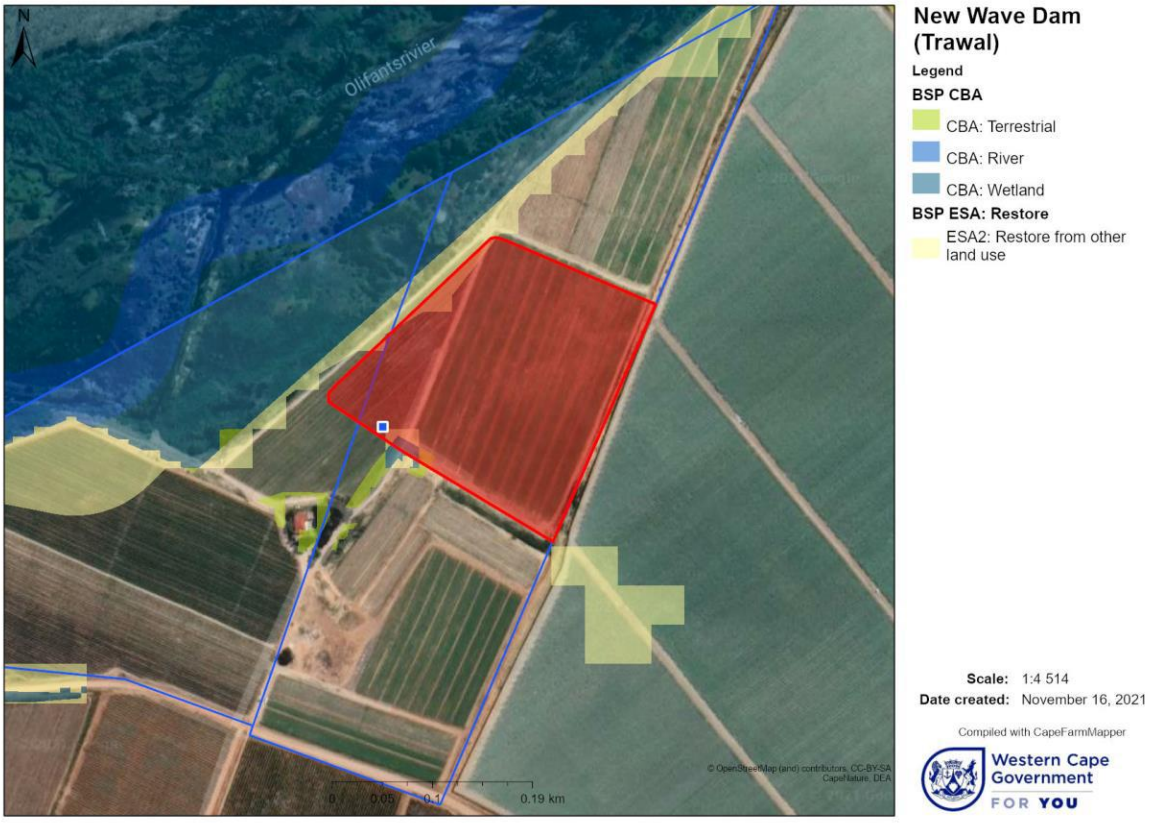

Figure 4: Critical Biodiversity Area ("CBA") intersecting the proposed site

Although the north-western part of the proposed dam is located within 32m of the Olifants River and overlaps a terrestrial ESA and an aquatic ESA, the footprint of the proposed dam will remain within areas that have been transformed by ploughing over the generations and terracing. The proposed dam is therefore unlikely to cause any significant new impacts that would lower the ecological status of the ESAs. This is dealt with in more detail in Section 10 of the EIR.

5.4 FRESHWATER

The findings and recommendations contained in the specialist report will be dealt with in more detail in Section 10 of the EIR.

5.5 CLIMATE

Vanrhynsdorp is the closest locality for which climatological data is available on-line.

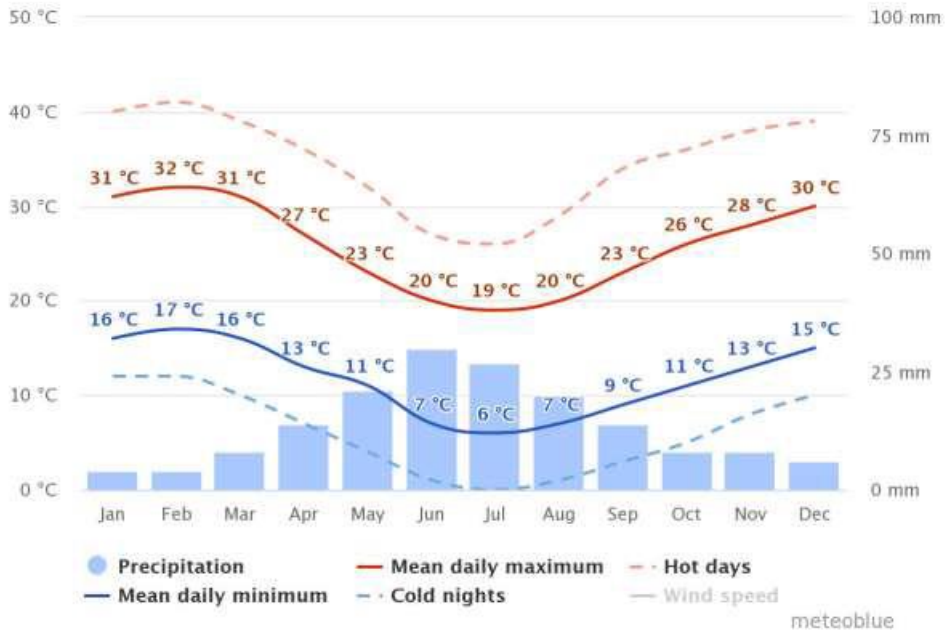

Figure 5: Climate of Vanrhynsdorp

This is an arid area, with hot and dry summers and with mild winters with little rain. The annual rainfall amounts to only 224mm. This is a harsh part of the world, with local names for districts such as the Knersvlakte and the Hardeveld, all part of the arid Namakwaland.

Rainfall is dependent of elevation, but even here is little consolation, as the Gifberg that rises above the coastal flats is on average 550 masl, which is too low for increasing the rainfall, for which 1500 masl and more is required.

The rainfall is far too little to sustain horticulture. The vineyards are very much dependent on irrigation out or the Olifants River and out of the irrigation canals. Water must be abstracted during the high flow winter months and stored for irrigation during the dry summer months when water is needed most. For this very reason, the proposed New Wave Dam is required. Without this dam, water security for the farming operation would be wholly lacking. The irrigation canals have weathered of age, may leak and even break down. The proposed irrigation dam will do much to store water for use during those times that the irrigation canals are not operational.

5.6 SOCIO-ECONOMIC CONTEXT

The establishment of the proposed dam will not create a significant number of new employment opportunities and instead the proposed dam will provide significantly greater job security for existing employees on the farm. The augmented water supply as a result of the proposed dam will

make the farm less prone to the risk of the irrigation water running out during the dry summer months and will create a few employment opportunities by providing a water supply that will allow the Applicant to look into the possibility of expanding operations in the future by 5ha to 8ha.

5.7 HERITAGE FEATURES

Although the proposed site has been transformed by ploughing over the generations and terracing, the proposed dam will alter more than 5000m^2 of land on the farm and therefore it is necessary in terms of the National Heritage Resources Act of 1998 that approval from Heritage western Cape be obtained for the proposed development.

A Notification to Develop was compiled for the proposed dam on the proposed site and submitted to Heritage Western Cape. Heritage Western Cape responded to the Notification to Develop (Appendix 1D1, refers) by deciding that "*no further studies are required*…". An Archaeological and Cultural Heritage Impact Assessment for the proposed dam on the proposed site is therefore not required.

6. PROCESS TO DATE

The section below outlines the various tasks undertaken to date, the members of the team involved in the project, as well as the Public Participation Process.

6.1 TASKS UNDERTAKEN TO DATE

Table 4: Tasks undertaken in the EIA to date.

DATE	TASK
SCOPING PHASE	
14 April 2023	Draft Scoping Report made available to I&APs and competent authority for comment for at least 30 days and application form submitted to competent authority
29 May 2023	Scoping Report and Plan of Study for EIR submitted to competent authority
05 July 2023	Letter received from competent authority confirming acceptance of Scoping Report and Plan of Study for EIR
ENVIRONMENTAL IMPACT ASSESSMENT REPORT PHASE (THIS PHASE)	
10 September 2023	Draft EIR submitted to competent authority and made available to I&APs for comment
21/10/2023	EIR submitted to competent authority

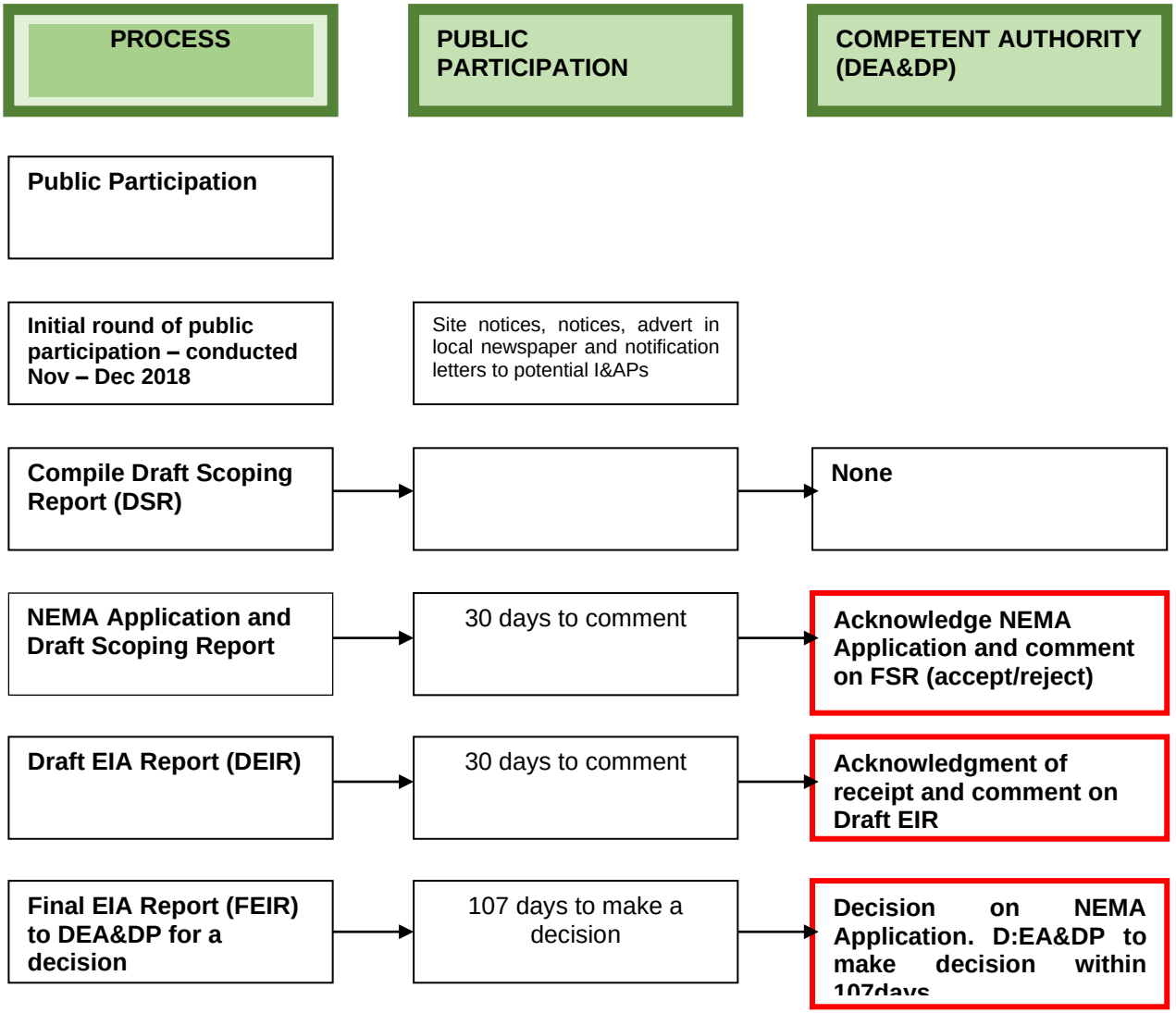

Figure 6. Summary of the EIA process and public participation process. The red indicates the stages where the competent authority will be consulted during the process.

6.2 TASKS UNDERTAKEN DURING THE EIA PHASE

The following tasks were undertaken during the EIA phase of the process:

- Respond to comments on Draft EIR. All comments received (including comments received on the scoping phase) and responses to the comments are incorporated in the EIR; and
- Prepare EIR for submission to competent authority for decision-making.

Please refer to Figure 6 to see where the public participation process is present in the environmental impact assessment. The I&APs were given the opportunity to comment on the Draft EIR before the EIR was compiled for submission to the DEADP. The figure also indicates the timeframes applicable to each stage in the process.

At the end of the comment period, the Draft EIR was revised in response to comments received from I&APs. All comments received and responses to the comments are incorporated in the EIR. The EIR was then submitted to the competent authority for consideration and decision-making.

Correspondence with I&APs was via post, telephone, electronic mail, pamphlets, posters and newspaper advertisements.

6.3 PROFESSIONAL TEAM

The following professionals are part of the project team.

Table 5: Members of the professional team

Role	SPECIFIC PERSON	ORGANISATION
Environmental Consultancy	Bernard de Witt	**EnviroAfrica**
Dam Engineers	Lizbe Bester	**Sarel Bester Ingenieuring BK**
Water Use Licensing Authority	Karin Visser	**National Department of Water and Sanitation**
Terrestrial Biodiversity Specialist	Peet Botes	**PB Consult**
Heritage Impact Specialist	Jonathan Kaplan	**Agency for Cultural Resource Management**
Freshwater specialist	Dr Dirk van Driel	**WATSAN AFRICA**

6.4 PUBLIC PARTICIPATION

A Public Participation Process was undertaken in accordance with the requirements of the EIA Regulations of 2014 (as amended): Guideline and Information Document Series. *Guidelines on Public Participation 2013.* The issues and concerns raised during the Scoping phase have been dealt with in this report.

I&APs were identified throughout the process. Landowners adjacent to the proposed site, relevant State Department, organs of state, organizations, the relevant ward councillor, and the Local and District Municipality were added to this database. The list of relevant organisations and individuals contacted is shown in **Appendix 1C1**

Public Participation was conducted for the proposed dam in accordance with the requirements outlined in Regulation 41, 42, 43 and 44 of the 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 of this application were dealt with throughout the application process.

As such, each subsection of Regulation 54 contained in Chapter 6 of the EIA Regulations will be addressed separately to demonstrate that all potential I&APs were notified of the proposed development.

Table 6: Summary of the public participation process

R41	Posters, Advertisement & Notification letters
(2) (a) (i)	Posters of size 60cm X 42cm were placed at gate next to gravel road entering the farm of Cederberg Farming Trawal, packshed of Cederberg Farming Trawal (Pty) Ltd, Trawal,at the Superspar, post office counter and at Trawal Handelhuis
(ii)	N/A No feasible alternative sites.
(2) (b) (iii)	Written notification was given to the relevant ward councillor of the Matzikama Local Municipality.
(iv)	Written notification was given to the Matzikama Local Municipality. and West Coast District Municipality.
(v)	Written notification was given to the following organs of state: • Western Cape Department of Environmental Affairs and Development Planning • LORWUA • CapeNature • Heritage Western Cape • Western Cape Department of Agriculture • National Department of 'Water and Sanitation
(vi)	Written notification was given to occupiers and owners of land parcels adjacent to the proposed site.
(2) (c) (i)	An advertisement was placed in the *Ons Kontrei* local newspaper of 14 April 2023
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.
R43	**Registered I&AP entitled to comments**
3	Potential I&APs were given at least 30 days to register and comment on the Draft reports.
R44	**I&AP to be recorded**
	A summary of the issues raised by I&AP and the responses made thereto is given in the Comments-Responses Report

6.4.1 PUBLIC PARTICIPATION UNDERTAKEN DURING THE EIR PHASE:

A number of groups and individuals were identified as Interested and Affected Parties during the pre-application phase and during the scoping phase. A list of the relevant organisations and individual groups identified to date, as well as individual I&APs is attached hereto as **Appendix 1C1.**

The Draft EIR and associated appendices were made available to all Registered I&APs for a commenting period of at least 30 days.

The Draft EIR was revised in response to feedback received from I&APs. All comments received and responses to the comments are incorporated in the EIR in the form of a Comments- Responses Table. The EIR was then be submitted to the competent authority for a decision to be made on the application.

6.4.2 INTERESTED AND AFFECTED PARTIES

I&APs were notified of the application in writing by means of advertising in a local newspaper, site notices and electronic mail correspondence.

A list of I&APs is included as **Appendix 1C1**

7. ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS

The proposed site was visited and environmental issues were raised through informal discussions with the project team, appointed specialists, I&APs and authorities.

The following potential issues were identified:

6.1 TERRESTRIAL BIODIVERSITY

The proposed dam will inundate more than 1ha of land in an area historically covered by Vanrhynsdorp Gannabosveld as well as the Namaqualand Riviere vegetation that is associated with the riparian zone of the Olifants River (Figure 7, refers).

Figure 7: Vegetation map of South Africa (2018 version) depicting vegetation types near the proposed dam

In addition, according to the WCBSP, the north-western portion of the dam overlaps an aquatic Ecological Support Area (Class 2) associated with the Olifants River and a Terrestrial ESA2. In light of these issues, a Terrestrial Biodiversity Compliance Statement dated 21 November 2021 has been compiled by PB Consult for the proposed dam (Appendix 2D, refers). The findings and recommendations contained therein are detailed in Section 10 of this EIR.

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6.2 FRESHWATER

The proposed water storage dam with a capacity of approximately 92 000m^3 is located within 32m of the bank of the Olifants River and therefore falls within the ambit of Items 12 and 19 of Listing Notice 1. In addition, according to the WCBSP, the north-western portion of the dam overlaps an aquatic Ecological Support Area (Class 2) associated with the Olifants River (Figure 8, refers).

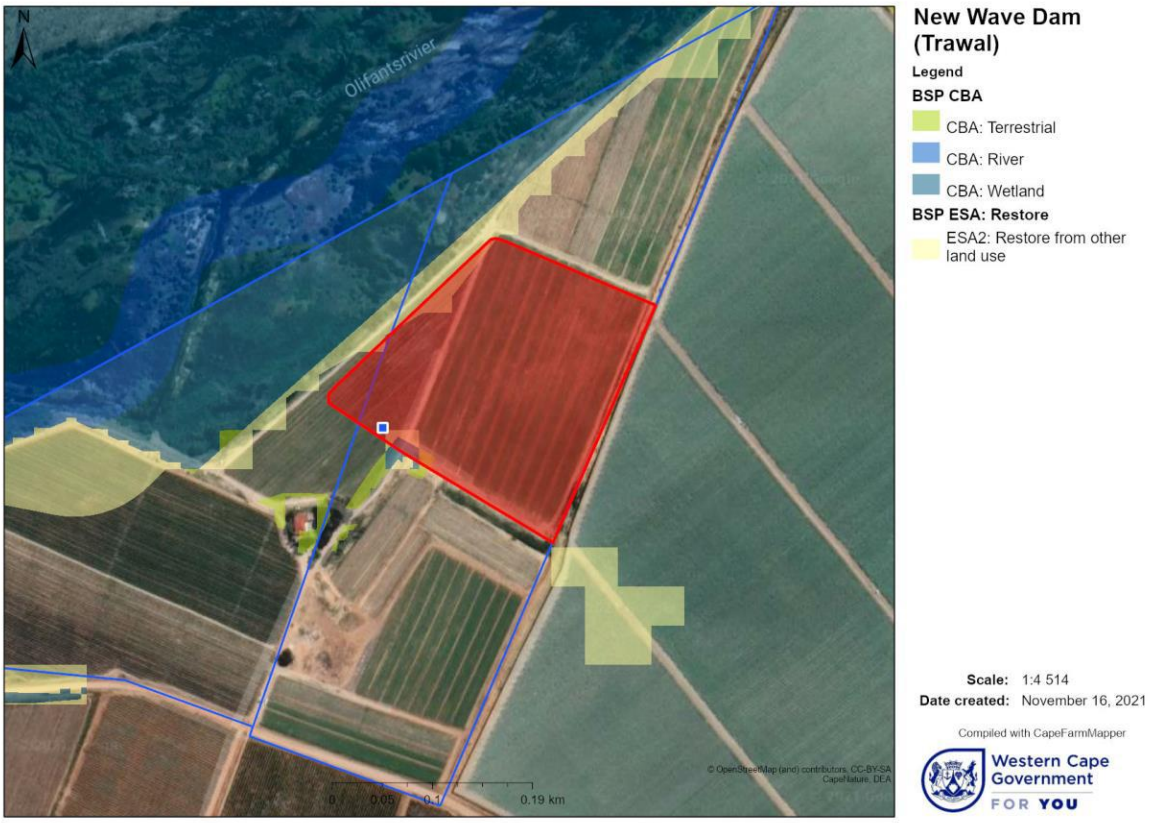

Figure 8: Western Cape Biodiversity Spatial Plan (2017) indicating the proposed dam location and surroundings

The potential impacts of the proposed dam on the riverine environment must therefore be taken account in this EIR. In light of these issues, an Aquatic Biodiversity Assessment Report dated September 2021 has been compiled by WATSAN Africa for the proposed dam (Appendix 2E, refers). The findings and recommendations contained therein are detailed in Section 10 of this EIR.

6.3 HERITAGE

Although the proposed site has been transformed by ploughing over the generations, the proposed dam will alter more than 5000m^2 of land on the farm and therefore it is necessary in terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) that approval from Heritage western Cape be obtained for the proposed development.

A Notification to Develop was compiled for the proposed dam on the proposed site and submitted to Heritage Western Cape. Heritage Western Cape issued a letter (Appendix 1D1, refers) responding to the Notification to Develop by deciding that "*no further studies are required*…". And further confirmed that the comment does not have a time limit.

6.4 VISUAL IMPACT

The potential impact on the sense of place of the proposed dam has been considered. However, in light of the agricultural nature of the proposed development and the similar land uses in the surrounding rural area, the visual impact of the proposed development is unlikely to be of significance. No further studies were suggested.

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6.5 GEOTECHNICAL

A geotechnical investigation is required for the proposed dam on the proposed site as indicated in the web-based Screening Tool Report generated for the application and this was confirmed by the competent authority in a letter dated 04 August 2022. The geotechnical study report is attached hereto as Appendix 2M. It is concluded in the report that are no geological features or conditions noted at this stage which might require special attention in the design. In addition, suitable material for the foundation of the proposed dam will have to be imported to the proposed site and a homogeneous wall profile in combination with a waterproof liner as a sealing mechanism is required instead of the typical clay core approach. Sand for use in sand filters and drains will also have to be imported from commercial sources.

6.6 SERVICES

Access to and from the proposed site is gained via existing gravel roads that connect to the N7 National Road. The proposed dam will not require any municipal services beyond the services that are currently available on the farm.

6.7 SOCIO-ECONOMIC IMPACT

The establishment of the proposed dam will not create a significant number of new employment opportunities. Instead, the additional water from the proposed dam will make the farm less prone to the risk of the irrigation water running out during the dry summer months and so the farm will become a more viable enterprise. This in turn will increase job security for the employees of the farm and the economic benefits of this will extend to the families of the farm employees and to the economy of the area surrounding the proposed site.

6.8 CUMULATIVE IMPACTS

The water that will be stored in the proposed dam is water that the applicant is currently abstracting in terms of an existing lawful water use allocation granted to the applicant by the LORWUA and will not be water gravitating from the surrounding catchment. In light of this, the existing lawful abstraction of water from the Bulshoek Dam Canal by the applicant will not introduce any new impacts to the Olifants River. The proposed dam will be located on agricultural fields that have historically been ploughed over and over and so very little likelihood exists that remnants of natural environment remain on the proposed site that could significantly be impacted by the proposed dam.

The possible cumulative impacts of the proposed dam are therefore likely to remain negligible when the recommendations contained in the specialist reports are implemented together with other impact avoidance and mitigation measures detailed in the EMPr.

6.9 OTHER ISSUES IDENTIFIED

All other issues raised during the public participation process were dealt with as the application proceeded.

8. SPECIALIST STUDIES

In light of the potential environmental risks and issues relating to the proposed development, the Applicant appointed specialists to proceed with the following:

- Terrestrial Biodiversity Assessment;
- Aquatic Biodiversity Assessment; and
- Notice of Intent to Develop (NID)

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

8.1 CRITERIA FOR SPECIALIST ASSESSMENT OF IMPACTS

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

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

8.2 BRIEFS FOR SPECIALIST STUDIES

8.2.1 Botanical Statement

Peet Botes of PB Consult conducted the terrestrial biodiversity assessment and compiled a Biodiversity Compliance Statement. Please find the report attached hereto as **Appendix 2D.**

The terms of reference when PB Consult was appointed are the following:

- Give a short statement on the vegetation and its condition encountered on the proposed site and the immediate surroundings;
- Determine and record the position of any species of special significance (e.g. protected tree species, or rare and endangered species) that should be avoided or that may require “search & rescue” intervention; and
- Make recommendations on impact minimisation should it be required.

8.2.2 Freshwater Assessment

Dr Dirk van Driel conducted the Freshwater Assessment and compiled the Freshwater Report. Please find the report attached hereto as **Appendix 2E**.

The appointment of a Freshwater Specialist was done, as the proposed dam is located within 32m of the Olifants River and the north-western portion of the proposed site overlaps an aquatic Ecological Support Area (Class 2) associated with the Olifants River.

The terms of reference for this appointment were the following:

- Literature review and assessment of existing information;
- Site Assessment of the proposed development and impact on the Olifants River and associated riparian area. This includes an assessment of the freshwater ecological condition, using river health indices such as in-stream and riparian habitat integrity, aquatic macro-invertebrates;
- Describe ecological characteristics of the relevant freshwater system and comment on the conservation value and importance of the freshwater systems;
- Evaluate the freshwater issues on the proposed site and propose mitigation measures and measures for the rehabilitation of the site as well as setback line (if applicable).

8.2.3 Archaeological and Cultural Heritage Impact Assessment

The proposed dam will alter more than 5000m^2 of land on the farm and therefore it is necessary in terms of the National Heritage Resources Act of 1998 that approval from Heritage western Cape be obtained for the proposed development.

A Notification of Intent to Develop ("NID") was compiled for the proposed dam on the proposed site and submitted to Heritage Western Cape. Heritage Western Cape responded in writing (Appendix 1D1, refers) to the NID by deciding that "*no further studies are required*…". An Archaeological and Cultural Heritage Impact Assessment for the proposed dam on the proposed site is therefore not required.

9. ENVIRONMENTAL IMPACT ASSESSMENT, SIGNIFICANCE AND MITIGATION METHODOLOGY

The following impact rating table used by EnviroAfrica CC is a basic exponential rating system to assess actual and potential negative environmental impacts of viable alternatives by the EAP.

Environmental activities or aspects are identified, based on:

- the phases of the project,
- the nature (or description) of the actual and potential impacts of the activities.

For every project activity or aspect, various environmental impacts are listed. Every negative impact is allocated a value – as per each of the following criteria:

- Probability (Likelihood)
- Extent
- Duration (Frequency)
- Consequence (Receiving Environment)
- Magnitude (Intensity/severity)

Every negative impact is allocated a (-)value as per each of the following criteria:

- Probability (Likelihood)
- Extent
- Duration (Frequency)
- Magnitude (Intensity/severity)

Once a value is allocated for each of the criterion, the scores are averaged to determine the final impact rating (see Table 6 below).

EnviroAfrica then further assesses environmental significance, based on the nature of the impact, as per the score and colour key which forms part of the table below. This results in impacts having either a low (indicated in green), medium (indicated in yellow) or high (indicated in orange and red) negative significance.

Note: i. As a baseline, impact rating values/scores are allocated taking the **worst-case** scenario into account *i.e.*, with no mitigation. The baseline rating is compared with those after mitigation has been taken into account i.e. the post-mitigation rating. Post mitigation rating is used for the actual impact assessment.

Table 6: Impact Assessment Methodology

SIGNIFICANCE CRITIERIA	Very High	High	Medium	Low	Negligible (very-low)	Score
Value	**16**	**8**	**4**	**2**	**1**	
Probability (likelihood) **(P)**	Definite. Impact will definitely occur.	Highly probable. Very likely for impact to occur.	Probable. Impact may likely occur.	Improbable. Impact may occur. Distinct Possibility	Improbable. Low likelihood/unlikely for impact to occur.	
Extent (E)	Impact potentially reaches beyond national boundaries	Impact has definite provincial/potential national consequences	Impact confined to regional area/ town	Impact confined to local region and impact on neighbouring properties	Impact confined to project property / site	
Duration (D)	Permanent The impact is expected to have a permanent impact, with very little to no rehabilitation possible	Long-Term The impact is expected to last for a long time after construction with rehabilitation expected to be 15-50 years. Impact is reversible but only with long-term mitigation	Medium-term The impact is expected to last for some time after construction with rehabilitation expected to be 5 - 15 years. Impact is reversible but only with on-going mitigation	Short-term The impact is expected to last for a relatively short time with rehabilitation expected to be 2-5 years. The impact is reversible through natural process and/or some mitigation.	Very short/ temporary The impact is expected to be temporary and last for a very short time with rehabilitation expected to be less than 2 years. The impact is easily reversible through natural process and/or some mitigation.	
Magnitude (Intensity/ Severity) **(M)**	It is expected that the activity will have a very severe to permanent impact on the surrounding environment. Functioning irreversibly impaired. Rehabilitation often impossible or unfeasible	It is expected that the activity will have a severe impact on the surrounding environment. Functioning may be severely impaired and may be temporarily cease. Rehabilitation will be needed to restore system integrity	It is expected that the activity will have an impact on the surrounding environment, but it will maintain its function, even if moderately modified (overall integrity not compromised). Rehabilitation easily achieved	It is expected that the activity will have a perceptible impact on the surrounding environment, but it will maintain its function, even if slightly modified (overall integrity not compromised). Rehabilitation easily achieved	It is expected that the impact will have little or no effect on the integrity of the surrounding environment	
Receiving environment (Consequence): **(RE)**	Very sensitive, pristine area – protected site or species permanently or seasonally present	Unused area containing only indigenous fauna / flora species	Unused area containing indigenous and alien fauna / flora species	Semi-disturbed area already rehabilitated / recovered from prior impact, or with moderate alien vegetation	Disturbed area/ transformed/ heavy alien vegetation	
FINAL RATING (average score)						

IMPACT SIGNIFICANCE RATING KEY:

Negative Impacts

SIGNIFICANCE	RATING	Final rating score / value range
Very Significant	Very High	-11 to -16
Significant	High	-7 to <-11
Increasing Significance	Medium	-4 to <-7
Insignificant	Low	-2 to <-4
	Very Low	-1 to <-2

Positive Impacts

SIGNIFICANCE	RATING	Final rating score / value range
Significant	High	10 to 16
Increasing Significance	Medium	4 to <10
Insignificant	Low	1 to <4

Environmental Significance Rating Methodology (rating criteria and significance key)

Please refer to Appendices 2G and 2H for more detail on the impact significance rating methodology used.

10. ASSESSMENT OF ENVIRONMENTAL IMPACTS

The specialist studies detailed in **Section 8** were undertaken to determine the significance of the impacts that may arise from the proposed development. The findings of the specialist studies are summarised here. Full copies of the studies are included in **Appendix 2D and 2E**.

The following studies were undertaken:

10.1 Terrestrial Biodiversity Compliance Statement

The Terrestrial Biodiversity Compliance Statement was compiled by Mr. Peet Botes of PB Consult. Please refer to **Appendix 2D** for the complete document.

10.1.1 Key findings

According to the 2018 version of the Vegetation Map of SA (Mucina & Rutherford, 2006) the site is located within an area that historically would have been covered by Vanrhynsdorp Gannabosveld with Namaqualand Riviere vegetation associated with the riparian zone of the Olifants River. Both these vegetation types are classified as "Least Threatened" in terms of "*List of ecosystems that are threatened and in need of protection*" (GN 1002, December 2011), promulgated in terms of the National Environmental Management Biodiversity Act, Act 10 of 2004. More recently the 2018 National Biodiversity Assessment (NBA) was published (Skowno et al., 2019a & Skowno et al, 2019b). Although the findings of the 2018 NBA are not yet formally adopted by the NEM: BA, both vegetation types remain classified as "Least Threatened" in terms of the 2018 NBA.

Mucina & Rutherford (2006) describe Vanrhynsdorp Gannabosveld as a succulent shrubland dominated by *Salsola* (over larger stretches), *Drosanthemum*, *Ruschia* and some disturbance indicators such as (mainly) short-lived Aizoaceae, including representatives of the genera *Galenia*, *Psilocaulon*, *Caulipsolon* and *Mesembryanthemum*. In the south, the shale plains can acquire a grassland appearance through seasonal dominance of *Bromus pectinatus* and *Stipa capensis*. Spectacular annual and geophyte flora can appear in spring after good winter rains.

The terrestrial biodiversity specialist has pointed out in the Biodiversity Compliance Statement that the site visit confirmed that the site was totally degraded/transformed because of agricultural practices. No natural veld remains as the total footprint and the soils had changed over time. The agricultural landscape has been subjected to significant soil disturbances over time as the area has been landscaped into terraced areas to accommodate agriculture. Coupled with fertilization programs the soils and soil chemical content changed significantly over time.

Weedy species and a few single hardy indigenous species were only encountered within the narrow strips between the fields (mostly on the embankments of the terraced areas. These weedy species included: *Amaranthus* species (Pigweed), *Atriplex* species, *Chenopodium album* ("misbredie"), *Conyza bonariensis* ("Skraalhans"), *Echium plantagineum* (purple echium), *Erodium moschatum* (musk heron's bill), *Lupinus luteus* (blue lupin), *Raphanus raphanistrum* (ramenas), *Ricinus communis* (Kasterolieboom) and *Salsola* species (naturalized weed), amongst others.

Only a few indigenous species were observed, and they were mostly hardy pioneer species which included small patches of the reed *Phragmites australis* (within the drainage lines next to the fields) (Photo 2), the occasional *Oxalis* cf. *pes-caprae* (yellow sorrel) and a small patch of *Albuca* cf. *canadensis* (slymstok) in the south-western corner of the site. The absolute lack of any representative natural veld or species confirms that the site can only be described as transformed.
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10.1.2 Impact Assessment

In light of the historical on-site agricultural activity causing an absence of indigenous vegetation that could provide habitat on the proposed site, it is indicated in the Biodiversity Compliance Statement that it is highly unlikely that the proposed development will lead to any significant impact on terrestrial biodiversity on the proposed site and surrounding area and that the recommendations are thus limited to good environmental practice.

10.1.3 Mitigation Measures

The recommendations given in the Terrestrial Biodiversity Compliance Statement are the following:

- The **river and wetland areas** to the north-west and west of the site must be regarded as **no-go areas**. All construction activities must be kept from extending to less than 32m from the Olifants River.
- A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase and ensure the riparian zone is not impacted in any way by the construction of the proposed dam.
- Lay-down areas or construction sites must be located within already disturbed areas or areas of low ecological value more than 32m from the Olfants River and must be pre-approved by the ECO.
- An integrated waste management approach must be implemented during construction.

10.2 Aquatic Biodiversity Assessment

The Aquatic Biodiversity Assessment was compiled by Dr Dirk van Driel of Watsan Africa. Please refer to **Appendix 2E** for the complete document

10.2.1 Key findings

The proposed water storage dam will be located within 32m of the Olifants River and in the Western Cape Biodiversity Spatial Plan, the Olifants River has been listed as a CBA. The Present Ecological State ("PES") of the river near the proposed dam site was therefore investigated and classified in accordance with the PES Protocol.

The PES classification indicates that near the proposed site, the Olifants River falls within Class D for both the in-stream and riparian zones. This means that the river near the proposed site has been modified and some ecological functioning has been lost. Further details on this are provided in the Aquatic Biodiversity Assessment in Appendix 2E.

The Ecological Importance of a river has been determined using the presence or absence of Endangered species in the river. In this case, it is the presence or absence of Endangered fish species that are known to inhabit the less impacted upper reaches of Olifants River that was considered. It is stated in the Aquatic Biodiversity Assessment that "*the Clanwilliam yellowfish do not occur in the Olifants River in the vicinity of the New Wave Dam anymore" and that it is therefore*

doubtful if the construction and the operation of the proposed New Wave Dam would in any way further compromise the status of any of these fish".

The Ecological Sensitivity of the Olifants River was also taken into account. It is pointed out in the Aquatic Biodiversity Assessment that Ecological Sensitivity can be defined as the potential of aquatic habitat to bounce back to an ecological condition closer to the situation prior to human impact. If it recovers, it is not regarded as sensitive.

Furthermore, "*it is stated in the report that the river at the proposed dam has been impacted to such an extent that it would be unthinkable that the original fish community would ever return. Likewise, it seems unthinkable that the river would bounce back if large-scale agriculture were removed from the catchment. This is not about to ever happen as long as human habitation exists*". In light of this, it has been concluded in the report that the Olifants River near the proposed dam site is not ecologically sensitive.

10.2.2 Impact Assessment

In light of the key findings summarised in 10.2.1, it is concluded in the Aquatic Biodiversity Assessment that if the impact mitigation measures recommended in the said report are implemented, the potential impacts of establishing the proposed dam on the Olifants River and associated riparian area near the proposed dam will be Medium to Low in significance, but more likely to be Low.

10.2.3 Mitigation Measures

The following impact mitigation measures have been recommended:

- Limit construction to the dry season and pave the toe of the dam.
- vegetate the new dam wall with indigenous plants under the guidance of an accredited botanist or horticulturalist prior to the next rainy season and maintain an alien vegetation clearing program for the dam wall.
- leave a small volume of water of 0.3m to 0.4m deep after the irrigation season so that the dam can continue to provide at least some aquatic habitat, albeit for waterfowl and a very limited range of other aquatic organisms.
- Protect and conserve the remaining few elements of the riparian area located beyond the development footprint by *inter alia*, maintaining a long-term alien vegetation clearance program to encourage ecological succession to ensue from the remaining few indigenous plants.
- The embankments along the river and further up the slope should be stabilised, erosion should be prevented and loose sediments along with stormwater should not be allowed to enter the river.
- Stormwater management infrastructure should be provided and maintained along the farm roads next to the vineyards.
- Agricultural return flow caused by over-irrigation must be prevented through the usage of electronically controlled systems designed to measure the moisture content of soils to adjust and regulate the volume of water that is to be irrigated with so that only the right amount of water is irrigated with.

Please refer to the Aquatic Biodiversity Assessment Report (Appendix 2E, refers) for more information.

10.2.4 Conclusion

The main drivers of the Olifants River are the winter rains, followed by the long and dry summer. This results in the typical extremes of high flow alternated by low flow and even drought flow. This pattern is hugely modified by human interference. High flows are reduced by large dams as well as a multitude of farm dams. Low flows are evened out with releases from the Clanwilliam Dam. This pattern will be even more modified if the Clanwilliam Dam wall is raised in accordance with existing plans. In the overall scheme, the proposed New Wave Dam's addition to the cumulative impact on the flow modification is negligible. This is particularly true because no new abstraction is called for. The purpose of the dam is for the storage of water that already has been allocated and is defined as an ELU. The only real impact is the possible transport of sediments into the river during the construction process. To ameliorate sediment transport, mitigation measures will have to be implemented. The proposed dam is an off-channel dam. It is to be built on land that has been farmed since the onset of agriculture in the valley. It is within the 100m buffer zone, for which approval is required. This reach of the Olifants River has been highly impacted by agriculture, with the banks formed into terraces for vineyards.

There is no reason why an approval should not be granted for establishing the proposed dam.

10.3 Heritage Assessment

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

- *any development or other activity which will change the character of a site exceeding 5000 m² in extent;*

A Notice of Intent to Develop (NID) was submitted to Heritage Western Cape by the Heritage Specialist (Agency for Cultural Resource Management). Heritage Western Cape confirmed in writing on 09 May 2022 (Appendix 1D1, refers) that since there is no reason to believe that the proposed new will impact on heritage resources, no further action under Section 38 of the National Heritage Resources Act (Act 25 of 1999) is required. Heritage Western Cape confirmed in writing on 24 March 2023 (Appendix 1D1, refers) that the written comment of 09 May 2022 does not have a time limit.

10.4. General

Impact management, mitigation, and monitoring measures are captured in the impact assessment and significance rating in **Appendices 2G** and **2H**, as well as in the EMPr attached hereto as **Appendix 2N**. 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 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 NEMA (as mended), as well as any additional specific information requested by any state department, including the competent authority. 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 decommissioning (if applicable) phases of the project. The overall outcome of the EMPr is to prevent avoidable environmental damage and/or minimize 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 by ensuring that the mitigation and management measures detailed in the EMPr are implemented and adhered to throughout the duration of the project. Compliance monitoring and independent auditing facilitate verification of the achievement of the EMPr outcomes and ultimately, fulfilment of the EMPr objectives. The EMPr is partly prescriptive (identifying specific people or organizations to undertake specific tasks, to ensure that impacts on the environment are minimized) 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 minimize the identified negative environmental impacts and to enhance the positive impact of the project on the environment;
- provides the 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 program to track and record compliance and identify and respond to any potential or actual negative environmental impacts; and
- provides a monitoring program to record any mitigation measures that are implemented

The following is a summary of potential impacts, objectives, and mitigation measures as captured in the EMPr:

Objective 1: Maintain a healthy biodiversity environment:

Potential Impacts:

- Soil contamination from construction materials; and
- Erosion

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

- A suitably qualified ECO must be appointed;
- Environmental Awareness training to be conducted with all workers that arrive on the proposed site and regular refresher training should be provided throughout the construction phase;
- Ensure construction activities are restricted to the demarcated footprint, strictly prohibit any construction-related activities outside of the demarcated footprint area;
- 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 on how to use spill kits to rectify a spill immediately. Records must be kept of any spills.
- Portable toilets **must not** be placed within 32m from the Olifants River and must be serviced regularly to prevent leakage/spillage.
- No material must be stockpiled within 32m of the Olifants River.

- 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.
- All alien plants must be removed from within the construction footprint and immediate surroundings.
- Previously removed soils (removed as part of the site preparation activities) should be used as topsoil for covering of the dam wall;
- It should be ensured that the topsoil used is free of weeds to limit the establishment of alien and invasive vegetation;
- Plant indigenous vegetation on the dam wall as soon as construction activities are completed.
- Implement and maintain an alien and invasive species control plan to prevent the establishment of such species.
- Erosion mitigation / control measures[4] must be implemented to reduce erosion associated with construction and operational activities where applicable.

Objective 2: Protection of Freshwater resources:

Potential Impacts:

- Damage to riparian area beyond proposed development footprint
- Erosion and sedimentation

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

- A suitably qualified ECO must be appointed;
- Environmental Awareness training to be provided to all workers arriving on the proposed site and refresher training should be provided throughout the construction phase.
- Ensure construction activities are restricted to the demarcated footprint, strictly prohibit any construction-related activities outside of the demarcated footprint area
- No material is to be stockpiled within 32m of any watercourse. The stockpiles must not exceed 2m in height.
- No concrete/ cement must 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. Drip trays are required and must be used for stationary heavy vehicles.
- The construction footprint must be kept as small as possible;
- All building rubble must be removed following the completion of the dam. Building rubble must not be stockpiled within 32m of the watercourse;
- No building rubble must be allowed to wash into the stream;
- Construction work must take place during the dry summer months
- Impact on areas outside of the designated construction area must be prevented and where applicable, rehabilitated with plant species characteristic of the area.

Objective 3: Prevent the loss of any heritage resources

Potential Impact: Loss of paleontological or archaeological resources

A Notice of Intent to Develop (NID) was submitted to Heritage Western Cape by the Heritage Specialist (Agency for Cultural Resource Management). Heritage Western Cape confirmed in writing on 09 May 2022 (**Appendix 1D1, refers**) that since there is no reason to believe that the proposed new will impact on heritage resources, no further action under Section 38 of the National Heritage

[4] Erosion control methods include silt fences, retention basins, detention ponds, interceptor ditches, seeding and sodding, riprap of exposed embankments, erosion mats and mulching. Exposed areas, susceptible to erosion, must be rehabilitated. This includes planting vegetation, characteristic of the pertinent vegetation type, to stabilize the soil.

Resources Act (Act 25 of 1999) is required. Heritage Western Cape confirmed in writing on 24 March 2023 that the written comment of 09 May 2022 does not have a time limit.

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

- A suitably qualified ECO must be appointed to oversee the construction phase from the start to the end;
- Environmental Awareness training to be conducted to all arriving workers and follow-up refresher training must be provided
- Ensure construction activities are restricted to the demarcated footprint, strictly prohibit any vehicles or construction-related activities outside of the demarcated footprint area
- Should any heritage resources, including evidence of graves and human burials, archaeological material and paleontological material be discovered during the execution of the activities above, all works must be stopped immediately, and Heritage Western Cape must be notified without delay. These should be safeguarded - preferably *in situ* - and reported by the ECO as soon as possible to Heritage Western Cape (Ms. Stephanie Barnardt - 021 483 9543). This area must be marked using visible means such as barrier tape, and all personnel should be informed that it is a no-go area.
- 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.
- 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 time approved by Heritage Western Cape

Any potential unforeseen impacts are covered in the EMPr (Appendix 2N, refers) that should be implemented.

11. ENVIRONMENTAL IMPACT STATEMENT

11.1 Summary of the key findings of the impact assessment

It is evident from the key findings discussed in detail in Section 10 that the proposed development is likely to cause low to negligible negative environmental impacts as a result of the implementation of the required impact mitigation measures. The impact mitigation measures are contained in the EMPr and so the proposed development can be authorised with strict adherence to the EMPr included as a condition of the environmental authorisation to be strictly enforced.

11.2 Sensitivity map

Figure 9: Sensitivity map showing ESA riparian corridor (no-go yellow strip) between dam footprint and Olifants River

The footprint of the proposed dam is depicted as a red polygon in Figure 9 above and it is within this footprint that the applicant is required to confine construction activities as much as possible. The strip of land located to the north-west and west of the proposed dam is to remain a no-go area. Indigenous vegetation will be planted and maintained on the dam wall and a long-term alien vegetation clearing program will be implemented to allow indigenous vegetation to prosper on the 'no-go' riparian strip.

11.3 Summary of positive and negative potential impacts

Please refer to **Appendices 2G and 2H** for full details on the potential impacts identified for the development proposal and for the assessment of the potential impacts for each phase of the development proposal. Table 7 below contains a summary of the key findings made during the EIR process.

Table 7: Impact Summary (Preferred Alternative)

Study	Impact	Significance No Mitigation/ Intervention	Significance With Mitigation/ Intervention
Phase: Construction			
Terrestrial	Clearance of indigenous vegetation	Low (Negative)	Very Low (Negative)

biodiversity	and loss of ecological connectivity with surrounding area.		
Freshwater	Increased sedimentation in the Olifants River during construction	High (Negative)	Low (Negative)
	Damage to riparian area	High (negative)	Low (Negative)
Socio-economic	Employment and skills-development opportunities created during the construction phase	Low (Positive)	N/A
Heritage	Loss and/or damage to potential archaeological and historical sites within the construction footprint	Negligible	Negligible
Palaeontology	Loss and/or damage to potential fossils within the construction footprint	Negligible	Negligible
Dust	Dust may be generated during the construction of the proposed dam.	Medium-Low (Negative)	Low (Negative)
Visual	Visual impact of construction activities and plant on site.	Low (Negative)	Low (Negative)
Traffic	Increase in trucks and construction plant.	Low (Negative)	Very Low (Negative)
Noise	Noise will be generated during the construction phase.	Low (Negative)	Very Low (Negative)
Geotechnical	Dam structural deficiencies	High (Negative)	Very low (Negative)

Study	Impact	Significance No Mitigation/ Intervention	Significance With Mitigation/ Intervention
Phase: Operational			
Terrestrial biodiversity	Recovery of indigenous vegetation in the riparian area between proposed dam and Olifants River	Medium (Positive)	N/A
Freshwater	Stormwater contamination, seepage and increased agricultural return flow, resulting in eutrophication.	Medium (Negative)	Low (Negative)
	Sedimentation in the river caused by erosion	Low (Negative)	Very Low (Negative)
Visual	Visual impact of the dam and agricultural development	Low (Negative)	Low (Negative)
Socio-economic	Retention of existing long-term employment.	Medium (Positive)	Medium (Positive)

It is evident in Table 7 that the significance of the potential negative impacts identified for the different phases of the development proposal range from low to negligible as a result of the implementation of the required impact mitigation measures.
The impact mitigation measures are specified in the EMPr that is attached to this EIR as Appendix N. Furthermore, the significance of the positive impacts envisaged for the proposed development ranges from low to medium.

The cumulative impacts on the surrounding catchment and the Olifants River that are likely to result from the proposed development range from low to negligible in significance, as the water to be stored in the proposed dam is water that the applicant currently abstracts from the Bulshoek Dam Canal in terms of an existing lawful water use allocation and not water gravitating from the surrounding catchment. In addition, the proposed dam will be located on agricultural fields that have historically been ploughed over and over and terraced and so very little likelihood exists that any noteworthy remnants of natural environment may be impacted on the proposed site. The potential cumulative negative impact on terrestrial biodiversity as a result of the proposed development is therefore also of low significance.

This impact summary is in Table 7 is applicable to a similar extent to all of the three dam design alternatives considered. The main difference with the dam design alternatives is that with Dam Design Alternative No.1, the water storage needs of the applicant will not be met and yet the costs of implementing this design alternative will not be significantly lower. In the case of Dam Design Alternative No. 2, the water storage needs of the applicant will be sufficient, without the financial costs becoming unacceptable to the applicant. In the case of Dam Design Alternative No. 3, the water storage capacity exceeds that of Dam Design Alternative No. 2. However, the costs of implementing Dam Design Alternative No. 3 are unacceptably high to the applicant.

Dam Design Alternative No. 2 also has the advantage of leaving the most land available for cultivation on the farm than the other two design alternatives, as Dam Design Alternative No. 2 entails locating the proposed dam closest to the Olifants River. Dam Design Alternative No. 2 is therefore the Preferred Alternative for the proposed development.

12. ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE

It is assumed that the EAP, specialists and all other members of the project team that contributed the information that has been used in the assessment of the potential impacts identified for the development proposal have remained within acceptable margins of error if it is that any errors have been made. In addition, it is assumed that the knowledge and experience of the EAP and the specialists has led to an assessment of potential impacts that adequately represents the reality of the situation on the proposed site and surrounding area so that the competent authority can make a decision that is socially, ecologically and economically appropriate.

13. CONCLUSION AND RECOMMENDATIONS

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

- Terrestrial Biodiversity Assessment
- Aquatic Biodiversity Assessment
- NID
- Geotechnical report

The specialist studies, geotechnical study and other information provided in the EIR indicate that the proposed development is unlikely to cause any significant negative ecological, social nor economic impacts if implemented with strict adherence to the recommended mitigation measures.

The mitigation measures as recommended by the EAP, specialists, commenting authorities and other I&APs that are contained in the EMPr must be strictly enforced if the proposed development is granted environmental authorisation.

The proposed development is required to ensure the long-term economic viability of the farm through a more reliable water supply that will be contributed to by the proposed dam.

The Preferred Alternative is the most practicable environmental option, as the Preferred Alternative strikes the best balance between the need to satisfy the water security requirements of the Applicant, the need to contain the financial costs of the applicant and the need to keep as much land available for cultivation on the farm as is feasible as well as the need to keep the potential negative ecological impacts low.

The 'no-go' alternative entails maintaining the status quo, meaning that the proposed dam will not be constructed and the farm will remain vulnerable to water shortages during the summer months as well as vulnerable to droughts. This is an economically undesirable situation, as it means that job security for the employees of the farm will remain precarious, even though the proposed dam can be granted environmental authorisation by the competent authority without any significant negative environmental impacts resulting.

In light of the above, the competent authority is urged to consider granting an environmental authorisation so that the applicant can establish the proposed dam and the environmental authorisation should contain conditions that are informed by the recommendations of the appointed project specialists, the EMPr and other conditions deemed appropriate by the competent authority.