PROPOSED EXPANSION OF AN INSTREAM DAM ON FARM 66/1 ROODEZANDSKLOOF, TULBAGH AND FARM 329 MODDERASRIVIER, TULBAGH

DRAFT BASIC ASSESSMENT REPORT

Date:
4 December 2025

Prepared for:
Modderasrivier Boerdery (Pty) Ltd.

Prepared by:
Lindsay Speirs Du Toit

earth GRACE ENVIRONMENTAL CONSULTANCY

21 St Andrews Close
Worcester
6850
Cell: 083 289 8727
Email: lindsay@earthgrace.co.za

Western Cape Government

Department of Environmental Affairs and Development Planning

BASIC ASSESSMENT REPORT

THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) AND THE ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS.

APRIL 2024

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APRIL 2024

(For official use only)	
Pre-application Reference Number (if applicable):	
EIA Application Reference Number:	16/3/3/6/7/1/B5/14/1191/25 (pre-app)
NEAS Reference Number:	
Exemption Reference Number (if applicable):	
Date BAR received by Department:	
Date BAR received by Directorate:	
Date BAR received by Case Officer:	

GENERAL PROJECT DESCRIPTION

(This must include an overview of the project, including the Farm name/Portion/Erf number)

Proposed Project:

Portion 1 of the Roode Zands Kloof Farm No. 66 is a fruit farm in the Tulbagh area, supporting fruit trees on 66 ha of the property. There are two dams close to each other on the farm, which are used for irrigation. The Modderasrivier Boerdery (Pty) Ltd. wishes to enlarge the existing in-stream Modderas Dam (Dam D1). The dam is a Category II dam with a storage capacity of 200,000 m³ and a maximum wall height of 13.8 m. Dam 2 is an off-channel dam with a capacity of 31,000 m³.

The planned storage capacity of the enlarged Modderas Dam will be 310,000 m³. An additional 110,000 m³ will therefore be stored. The Modderas Dam will be filled in terms of the Existing Lawful Use (ELU) for the farm, and a Water Use Licence Application (WULA) has been submitted to the Department of Water and Sanitation (DWS) for the additional storage of water.

The project will involve the following components:

- *Enlargement of Modderas Dam from 200,000 m³ (13.8 m wall high) to a gross storage capacity of 310,000 m³ (15.1 m wall high). The proposed total footprint area = 7.5 ha, which is only 2.2 ha of additional footprint area.*
- *Extension of the existing Ø200 mm Class 6 uPVC outlet pipe on the upstream side.*
- *Proposed by-pass spillway to discharge into the existing channel.*
- *Decommissioning of Dam D2. Decommissioning would involve leaving the dam as is and not storing water in the dam apart from natural runoff and rainwater.*

The existing pump station will be used. All the materials required for the enlargement of Modderas Dam will be obtained for the basin. Additional rip-rap material would be sourced from the irrigation areas on the farm.

See Figure 1 and Appendix B1.

NOTES: MODDERAS DAM - OPTION 1

GENERAL:

1.	NON-OVERSPILL CREST LEVEL:	255.6 masl
2.	FULL SUPPLY LEVEL:	254.1 masl
3.	FREEBOARD:	1.5m
4.	WATER SURFACE AREA AT FSL:	5.5 ha
5.	GROSS CAPACITY:	319 000 m³
6.	CREST LENGTH:	387 m
7.	CREST WIDTH:	4.0 m
8.	MAXIMUM WALL HEIGHT:	15.1 m
9.	UPSTREAM SLOPE:	1V3H
10.	DOWNSTREAM SLOPE:	1V2H
11.	MINIMUM DAM LEVEL:	240.0 masl
12.	DOWNSTREAM TOE LEVEL:	249.5 masl

ADDITIONAL NOTES

A. ALL DIMENSIONS IN METRES UNLESS OTHERWISE SHOWN.
B. ALL LEVELS IN METRES ABOVE SEA LEVEL (masl
C. CONTOUR INTERVAL 1m
D. PROJECTION: WGS 84 - Lo19

ABBREVIATIONS

NGL	-	NATURAL GROUND LEVEL
FSL	-	FULL SUPPLY LEVEL
NOC	-	NON-OVERSPILL CREST
"P	-	TEST-PIT POSITION (i.e TP 2)
RDF	-	RECOMMENDED DESIGN FLOOD
SEF	-	SAFETY EVALUATION FLOOD
"BC	-	TO BE CONFIRMED

SURVEY BENCHMARKS CO-ORDINATES			
NAME	Y	X	Z
M1	-11676.000	3615994.400	254.600
M2	-11660.330	3615156.530	240.708
M3	-11716.280	3615987.740	253.002

A	28/03/2025	INFORMATION	HBCE CONSULTING
No.	DATE	REVISION DESCRIPTION	

INFORMATION

GENERAL NOTES
ALL DIMENSIONS UNLESS OTHERWISE SHOWN ON THIS DRAWING
ALL DIMENSIONS AND LEVELS TO BE CONFIRMED ON SITE PRIOR TO MANUFACTURING AND CONSTRUCTION
THE POSITION OF ALL EXISTING SERVICES ARE TO BE OBTAINED FROM LOCAL AUTHORITIES AND/OR OWNER. IF UNKNOWN THE EXACT POSITION SHALL BE DETERMINED BY CAREFUL HAND EXCAVATION.

CLIENT: MODDERAS BOERDERY

HAGEN-DRINK

ENLARGEMENT OF MODDERAS DAM

PLAN LAYOUT OF EMBANKMENT AND SPILLWAY

AS SHOWN | SCALE: | DRAWING SIZE: A1

APPROVED BY | SIGNATURE | DATE

DESIGNED BY: J. MBENGA | CHECKED BY: Wilu PLESSIS

DRAWN BY: J. MBENGA | DATE: 28/03/2025

PROJECT No: DJH305 | DRG No: DJH305-03 | REV No: A

Figure 1. Diagram of the proposed enlargement of the Modderas Dam.

Location:

The existing dam is situated on Portion 1 of Farm No. 66 (Roode Zands Kloof), located to the northwest of Tulbagh in the Tulbagh Valley in the Western Cape. The proposed enlarged dam will extend slightly into Farm 329, Tulbagh which is located within Farm 1/66, Tulbagh. The farm is located approximately 8 km north of Tulbagh. See Figure 2 and Appendix A.

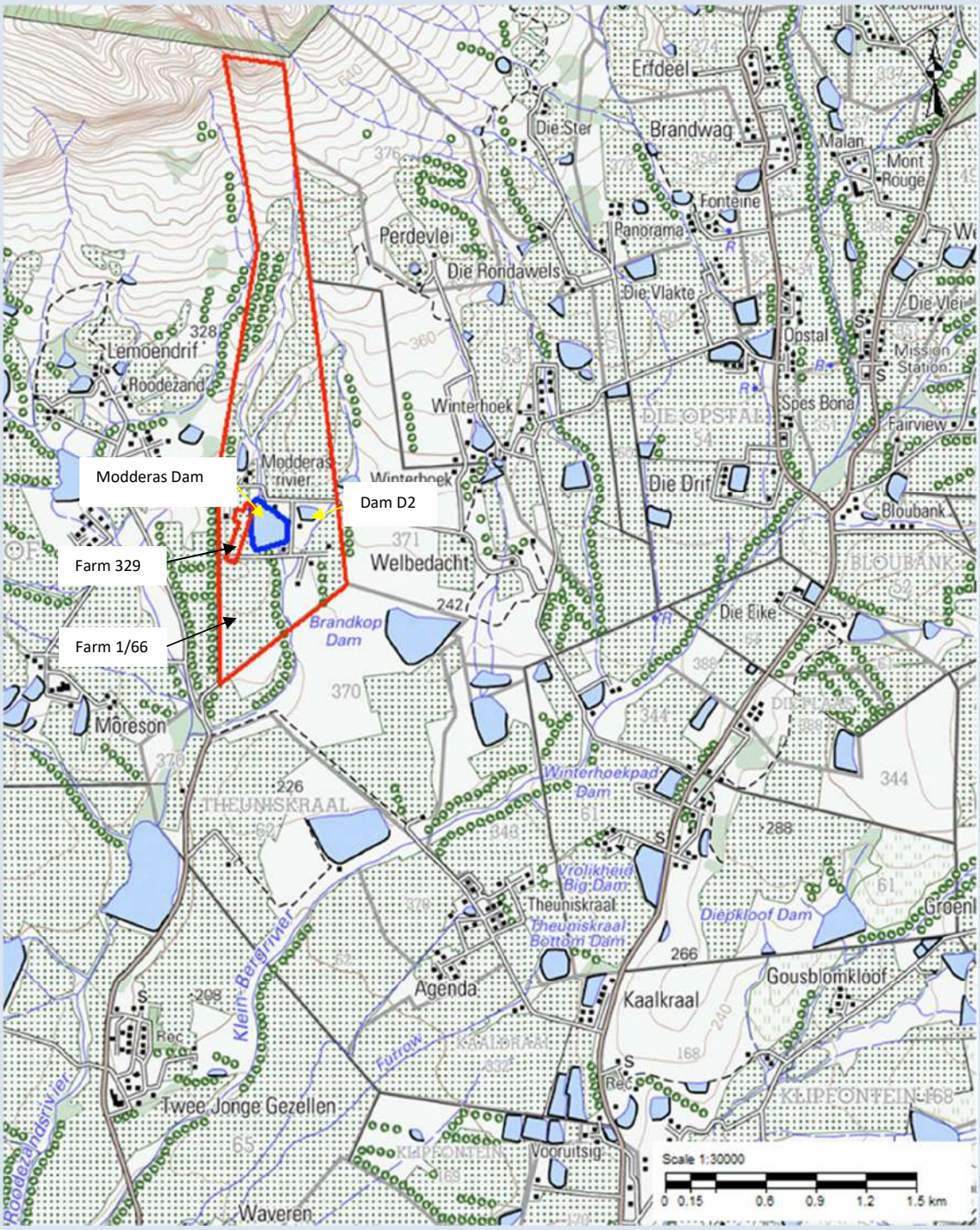


Figure 2: Locality map for the proposed expansion of the Modderas Dam near Tulbagh.

The property is developed to full capacity in terms of existing crops planted and irrigated. The drought and climate change have motivated the applicant to secure his water sources, primarily to ensure a water supply for irrigating permanent crops during the summer. Dam D2 was damaged in recent floods and is thus no longer able to hold the full 31,000 m³ for which it was designed. The applicant has decided that it is a better solution to compensate for lost storage by enlarging the Modderas Dam, rather than repairing the damage to Dam 2.

IMPORTANT INFORMATION TO BE READ PRIOR TO COMPLETING THIS BASIC ASSESSMENT REPORT

1. **The purpose** of this template is to provide a format for the Basic Assessment report as set out in Appendix 1 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA"), Environmental Impact Assessment ("EIA") Regulations, 2014 (as amended), in order to ultimately obtain Environmental Authorisation.

2. The Environmental Impact Assessment ("EIA") Regulations are defined in terms of Chapter 5 of the National Environmental Management Act, 19998 (Act No. 107 of 1998) ("NEMA"), hereinafter referred to as the "NEMA EIA Regulations".

3. *Submission of documentation, reports and other correspondence:*

   The Department has adopted a digital format for corresponding with proponents/applicants or the general public. If there is a conflict between this approach and any provision in the legislation, then the provisions in the legislation prevail. If there is any uncertainty about the requirements or arrangements, the relevant Competent Authority must be consulted.

   The Directorate: Development Management has created generic e-mail addresses for the respective Regions to centralise their administration. Please make use of the relevant general administration e-mail address below when submitting documents:

   DEADPEIAAdmin@westerncape.gov.za
   Directorate: Development Management (Region 1):
   City of Cape Town; West Coast District Municipal area;
   Cape Winelands District Municipal area and Overberg District Municipal area.

   DEADPEIAAdmin.George@westerncape.gov.za
   Directorate: Development Management (Region 3):
   Garden Route District Municipal area and Central Karoo District Municipal area

   General queries must be submitted via the general administration e-mail for EIA-related queries. Where a case officer of DEA&DP has been assigned, correspondence may be directed to such official and copied to the relevant general administration e-mail for record purposes.

   All correspondence, comments, requests and decisions in terms of applications will be issued to either the applicant/requester in a digital format via email, with digital signatures, and copied to the Environmental Assessment Practitioner ("EAP") (where applicable).

4. The required information must be typed within the spaces provided in this Basic Assessment Report ("BAR"). The sizes of the spaces provided are not necessarily indicative of the amount of information to be provided.

5. All applicable sections of this BAR must be completed.

6. Unless protected by law, all information contained in, and attached to this BAR, will become public information on receipt by the Competent Authority. If information is not submitted with this BAR due to such information being protected by law, the applicant and/or Environmental Assessment Practitioner ("EAP") must declare such non-disclosure and provide the reasons for believing that the information is protected.

7. This BAR is current as of **April 2024**. It is the responsibility of the Applicant/ EAP to ascertain whether subsequent versions of the BAR have been released by the Department. Visit this Department's website at http://www.westerncape.gov.za to check for the latest version of this BAR.

8. This BAR is the standard format, which must be used in all instances when preparing a BAR for Basic Assessment applications for an environmental authorisation in terms of the NEMA EIA Regulations when the Western Cape Government Department of Environmental Affairs and Development Planning ("DEA&DP") is the Competent Authority.

9. Unless otherwise indicated by the Department, one hard copy and one electronic copy of this BAR must be submitted to the Department at the postal address given below or by delivery thereof to the Registry Office of the Department. Reasonable access to copies of this Report must be provided to the relevant Organs of State for consultation purposes, which may, if so indicated by the Department, include providing a printed copy to a specific Organ of State.

10. This BAR must be duly dated and originally signed by the Applicant, EAP (if applicable) and Specialist(s) and must be submitted to the Department at the details provided below.

11. The Department's latest Circulars pertaining to the "One Environmental Management System" and the EIA Regulations, any subsequent Circulars, and guidelines must be taken into account when completing this BAR.

12. Should a water use licence application be required in terms of the National Water Act, 1998 (Act No. 36 of 1998) ("NWA"), the "One Environmental System" is applicable, specifically in terms of the synchronisation of the consideration of the application in terms of the NEMA and the NWA. Refer to this Department's Circular EADP 0028/2014: One Environmental Management System.

13. Where Section 38 of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) ("NHRA") is triggered, a copy of Heritage Western Cape's final comment must be attached to the BAR.

14. The Screening Tool developed by the National Department of Environmental Affairs must be used to generate a screening report. Please use the Screening Tool link https://screening.environment.gov.za/screeningtool to generate the Screening Tool Report. The screening tool report must be attached to this BAR.

15. Where this Department is also identified as the Licensing Authority to decide on applications under the National Environmental Management: Air Quality Act (Act No. 29 of 2004) ('NEM:AQA'), the submission of the Report must also be made as follows, for-
    Waste Management Licence Applications, this report must also (i.e., another hard copy and electronic copy) be submitted for the attention of the Department's Waste Management Directorate (Tel: 021-483-2728/2705 and Fax: 021-483-4425) at the same postal address as the Cape Town Office.

    Atmospheric Emissions Licence Applications, this report must also be (i.e., another hard copy and electronic copy) submitted for the attention of the Licensing Authority or this Department's Air Quality Management Directorate (Tel: 021 483 2888 and Fax: 021 483 4368) at the same postal address as the Cape Town Office.

DEPARTMENTAL DETAILS	
CAPE TOWN OFFICE: **DIRECTORATE: DEVELOPMENT MANAGEMENT (REGION 1)** (City of Cape Town, West Coast District, Cape Winelands District & Overberg District)	**GEORGE REGIONAL OFFICE:** **DIRECTORATE: DEVELOPMENT MANAGEMENT (REGION 3)** (Central Karoo District & Garden Route District)
The completed Form must be sent via electronic mail to: DEADPEIAAdmin@westerncape.gov.za Queries should be directed to the Directorate: Development Management (Region 1) at: E-mail: DEADPEIAAdmin@westerncape.gov.za Tel: (021) 483-5829 Western Cape Government Department of Environmental Affairs and Development Planning Attention: Directorate: Development Management (Region 1) Private Bag X 9086 Cape Town, 8000	The completed Form must be sent via electronic mail to: DEADPEIAAdmin.George@westerncape.gov.za Queries should be directed to the Directorate: Development Management (Region 3) at: E-mail: DEADPEIAAdmin.George@westerncape.gov.za Tel: (044) 814-2006 Western Cape Government Department of Environmental Affairs and Development Planning Attention: Directorate: Development Management (Region 3) Private Bag X 6509 George, 6530

MAPS

Provide a location map (see below) as Appendix A1 to this BAR that shows the location of the proposed development and associated structures and infrastructure on the property.	
Locality Map:	The scale of the locality map must be at least 1:50,000. For linear activities or development proposals of more than 25 kilometres, a smaller scale, e.g., 1:250 000, can be used. The scale must be indicated on the map. The map must indicate the following: • an accurate indication of the project site position as well as the positions of the alternative sites, if any; • road names or numbers of all the major roads, as well as the roads that provide access to the site(s) • a north arrow; • a legend; and • a linear scale. For ocean-based or aquatic activity, the coordinates must be provided within which the activity is to be undertaken, and a map at an appropriate scale, clearly indicating the area within which the activity is to be undertaken. Where comment from the Western Cape Government: Transport and Public Works is required, a map illustrating the properties (owned by the Western Cape Government: Transport and Public Works) that will be affected by the proposed development must be included in the Report.
Provide a detailed site development plan/site map (see below) as Appendix B1 to this BAR; and if applicable, all alternative properties and locations.	
Site Plan:	Detailed site development plan(s) must be prepared for each alternative site or alternative activity. The site plans must contain or conform to the following: • The detailed site plan must preferably be at a scale of 1:500 or at an appropriate scale. The scale must be clearly indicated on the plan, preferably together with a linear scale. • The property boundaries and numbers of all the properties within 50m of the site must be indicated on the site plan. • On land where the property has not been defined, the coordinates of the area in which the proposed activity or development is proposed must be provided. • The current land use (not zoning) as well as the land use zoning of each of the adjoining properties must be clearly indicated on the site plan. • The position of each component of the proposed activity or development, as well as any other structures on the site, must be indicated on the site plan. • Services, including electricity supply cables (indicate aboveground or underground), water supply pipelines, boreholes, sewage pipelines, storm water infrastructure and access roads that will form part of the proposed development **must** be clearly indicated on the site plan. • Servitudes and an indication of the purpose of each servitude must be indicated on the site plan. • Sensitive environmental elements within 100m of the site must be included on the site plan, including (but not limited to): o Watercourses / Rivers / Wetlands

	○ Flood lines (*i.e.*, 1:100 year, 1:50 year and 1:10 year where applicable); ○ Coastal Risk Zones as delineated for the Western Cape by the Department of Environmental Affairs and Development Planning ("DEA&DP"): ○ Ridges; ○ Cultural and historical features/landscapes; ○ Areas with indigenous vegetation (even if degraded or infested with alien species). • Whenever the slope of the site exceeds 1:10, a contour map of the site must be submitted. • North arrow A map/site plan must also be provided at an appropriate scale, which superimposes the proposed development and its associated structures and infrastructure on the environmental sensitivities of the preferred and alternative sites, indicating any areas that should be avoided, including buffer areas.
Site photographs	Colour photographs of the site that show the overall condition of the site and its surroundings (taken on the site and taken from outside the site), with a description of each photograph. The vantage points from which the photographs were taken must be indicated on the site plan, or locality plan, as applicable. If available, please also provide a recent aerial photograph. Photographs must be attached to this BAR as **Appendix C**. The aerial photograph(s) should be supplemented with additional photographs of relevant features on the site. Date of photographs must be included. Please note that the above requirements must be duplicated for all alternative sites.
Biodiversity Overlay Map:	A map of the relevant biodiversity information and conditions must be provided as an overlay map on the property/site plan. The Map must be attached to this BAR as **Appendix D**.
Linear activities or development and multiple properties	GPS co-ordinates must be provided in degrees, minutes and seconds using the Hartebeeshoek 94 WGS84 co-ordinate system. Where numerous properties/sites are involved (linear activities), you must attach a list of the Farm Name(s)/Portion(s)/Erf number(s) to this BAR as an Appendix. For linear activities that are longer than 500m, please provide a map with the coordinates taken every 100m along the route to this BAR as **Appendix A3**.

ACRONYMS

DAFF:	Department of Forestry and Fisheries
DEA:	Department of Environmental Affairs
DEA& DP:	Department of Environmental Affairs and Development Planning
DHS:	Department of Human Settlement
DoA:	Department of Agriculture
DoH:	Department of Health
DWS:	Department of Water and Sanitation
EMPr:	Environmental Management Programme
HWC:	Heritage Western Cape
NFEPA:	National Freshwater Ecosystem Protection Assessment
NSBA:	National Spatial Biodiversity Assessment
TOR:	Terms of Reference
WCBSP:	Western Cape Biodiversity Spatial Plan
WCG:	Western Cape Government

ATTACHMENTS

Note: The Appendices must be attached to the BAR as per the list below. Please use a ✓ **(**tick) or an **x** (cross) to indicate whether the Appendix is attached to the BAR.

The following checklist of attachments must be completed.

APPENDIX			**✓ (Tick) or x (cross)**
Appendix A:	**Maps**		
	Appendix A1:	**Locality Map**	✓
	Appendix A2:	**Coastal Risk Zones as delineated in terms of ICMA for the Western Cape by the Department of Environmental Affairs and Development Planning**	*N/A*
	Appendix A3:	**Map with the GPS coordinates for linear activities**	*N/A*
Appendix B:	**Appendix B1:**	**Site development plan(s)**	✓
	Appendix B2	**Constraints Maps**	✓
Appendix C:	**Photographs**		✓
Appendix D:	**Biodiversity overlay map**		✓
Appendix E:	**Permit(s) / license(s) / exemption notice, agreements, comments from the State Department/Organs of state and service letters from the municipality.**		
	Appendix E1:	**Final comment/ROD from HWC**	*N/A*
	Appendix E2:	**Copy of comment from Cape Nature**	*To be included in the Draft BAR*
	Appendix E3:	**Final Comment from the DWS**	*To be included in the Draft BAR*
	Appendix E4:	**Comment from the DEA: Oceans and Coast**	*N/A*
	Appendix E5:	**Comment from the DAFF**	*To be included in the Draft BAR*
	Appendix E6:	**Comment from WCG: Transport and Public Works**	*To be included in the Draft BAR*
	Appendix E7:	**Comment from WCG: DoA**	*To be included in the Draft BAR*
	Appendix E8:	**Comment from WCG: DHS**	*N/A*
	Appendix E9:	**Comment from WCG: DoH**	*N/A*

	Appendix E10:	**Comment from DEA&DP: Pollution Management**	*To be included in the Draft BAR*
	Appendix E11:	**Comment from DEA&DP: Waste Management**	*To be included in the Draft BAR*
	Appendix E12:	**Comment from DEA&DP: Biodiversity**	*To be included in the Draft BAR*
	Appendix E13:	**Comment from DEA&DP: Air Quality**	*N/A*
	Appendix E14:	**Comment from DEA&DP: Coastal Management**	*N/A*
	Appendix E15:	**Comment from the local authority**	*To be included in the Draft BAR*
	Appendix E16:	**Confirmation of all services (water, electricity, sewage, and solid waste management)**	*N/A*
	Appendix E17:	**Comment from the District Municipality**	*To be included in the Draft BAR*
	Appendix E18:	**Copy of an exemption notice**	*N/A*
	Appendix E19	**Pre-approval for the reclamation of land**	*N/A*
	Appendix E20:	**Proof of agreement/TOR of the specialist studies conducted.**	✓
	Appendix E21:	**Proof of land use rights**	*The site is situated within a working farm.*
	Appendix E22:	**Proof of public participation agreement for linear activities**	***x***
Appendix F:	**F1: List of I&APs** **F2: Notification of I&APs and Proof** **F3: Notification of State Departments and Proof** **F4: Advertisement** **F5: Site Notice** **F6: Comments Received** **F7: Comments and Response Report** **F8: Correspondence with State Departments**		✓
Appendix G:	**G1: Dam Design Report** **G2: Aquatic Assessment** **G3a: WULA Summary Report** **G3b: Proof of WULA submission** **G3c: Water Rights Certificate**		✓
Appendix H:	**EMPr**		✓
Appendix I:	**Screening tool report**		✓

Appendix J:	**The impact and risk assessment for each alternative**	*Included in the report*
Appendix K:	**Need and desirability**	✓
Appendix L	**Site Sensitivity Verification Report**	✓

SECTION A: ADMINISTRATIVE DETAILS

Highlight the Departmental Region in which the intended application will fall.	***CAPE TOWN OFFICE: REGION 1***		GEORGE OFFICE: REGION 3
	(City of Cape Town, West Coast District	***(Cape Winelands District & Overberg District)***	(Central Karoo District & Garden Route District)
Name of Applicant/Proponent:	*Modderasrivier Boerdery (Pty) Ltd.*		
Name of contact person for Applicant/Proponent (if other):	*Philip du Plessis*		
Company/ Trading name/State Department/Organ of State:			
Company Registration Number:	*2011/144008/07*		
Postal address:	*PO Box 138, Tulbagh*		
		Postal code: 6820	
Telephone:		*Cell: 084 6576797*	
E-mail:	*info@modderasrivier.co.za*	*Fax:*	
Company of EAP:	*Lindsay Speirs Du Toit trading as Earth Grace Environmental Consultancy*		
EAP name:	*Lindsay Speirs Du Toit*		
Postal address:	*21 St Andrews Close, Worcester*		
		Postal code: 6850	
Telephone:		*Cell: 083 2898727*	
E-mail:	*lindsay@earthgrace.co.za*	*Fax:*	
Qualifications:	*Master's Degree in Geography and Environmental Studies (Stellenbosch University)*		
EAP registration no:	*2019/1470*		
Farm 329 and Farm 1/66, Tulbagh: Name of landowner:	*Modderasrivier Trust*		
Name of contact person for landowner (if other):	*Philip du Plessis*		
Postal address:	*PO Box 138, Tulbagh*		
		Postal code: 6820	
Telephone:		*Cell: 084 6576797*	
E-mail:	*info@modderasrivier.co.za*	*Fax:*	
Farm 329 and Farm 1/66, Tulbagh: Name of Person in control of the land:	*Modderasrivier Boerdery (Pty) Ltd.*		
Name of contact person for the person in control of the land:	*Philip du Plessis*		
Postal address:	*PO Box 138, Tulbagh*	*Postal code: 6820*	
Telephone:		*Cell: 084 6576797*	
E-mail:	*info@modderasrivier.co.za*	*Fax:*	

Municipality in whose area of jurisdiction the proposed activity will fall:	*Witzenberg Municipality*	
Contact person:	*David Nasson*	
Postal address:	*50 Voortrekker Street, Ceres*	
		Postal code: 6835
Telephone	*023 3168196*	*Cell:*
E-mail:	*david@witzenberg.gov.za*	*Fax:*

SECTION B: CONFIRMATION OF SPECIFIC PROJECT DETAILS AS INCLUDED IN THE APPLICATION FORM

1.	Is the proposed development (please tick):	New		*Expansion*	✓
2.	Is the proposed site(s) a brownfield or greenfield site? Please explain.				

This is a brownfield site. The proposed site is an existing operational farm dam that will be enlarged. The disturbance footprint of the larger dam will extend into old farmlands, existing crops and into disturbed land that has been fallow for several years.

Figure 3. Disturbed lands to the north and east of the dam.

3.	**For Linear activities or developments: N/A**			
3.1.	Provide the Farm(s)/Farm Portion(s)/Erf number(s) for all routes:			
3.2.	Development footprint of the proposed development for all alternatives.			m²
3.3.	Provide a description of the proposed development (e.g. for roads, the length, width and width of the road reserve; in the case of pipelines, indicate the length and diameter) for all alternatives.			
3.4.	Indicate how access to the proposed routes will be obtained for all alternatives.			
3.5.	SG Digit codes of the Farms/Farm Portions/Erf numbers for all alternatives			
3.6.	**Starting point co-ordinates for all alternatives**			
	Latitude (S)	°	‘	“
	Longitude (E)	°	‘	“
	Middle point co-ordinates for all alternatives.			
	Latitude (S)	°	‘	“
	Longitude (E)	°	‘	“
	End point co-ordinates for all alternatives.			
	Latitude (S)	°	‘	“
	Longitude (E)	°	‘	“

Note: For Linear activities or developments longer than 500m, a map indicating the coordinates for every 100m along the route must be attached to this BAR as Appendix A3.		
4.	**Other developments**	
4.1.	Property size(s) of all proposed site(s):	*Portion 1 of Farm 66: 155.74 ha* *Farm 329: 2/14ha*
4.2.	Developed footprint of the existing facility and associated infrastructure (if applicable):	*Approx. 5.3 ha / 53,000* m^2
4.3.	Development footprint of the proposed development and associated infrastructure size(s) for all alternatives:	*The enlarged dam will measure approximately 7.5 ha in total. i.e. an additional 2.2 ha (22,00* m^2*)*
4.4.	Provide a detailed description of the proposed development and its associated infrastructure (This must include details of e.g. buildings, structures, infrastructure, storage facilities, sewage/effluent treatment and holding facilities).	

Proposed project:

The existing Modderas Dam is an in-stream dam on the Modderas River. The dam has a maximum capacity of 200,000 m³ and a wall height of 13.8 m. The intention is to increase the capacity of the Modderas Dam to 310,000 m³ and decommission Dam 2 nearby (see Figure 4).

The farm supports a total combined area of 66,5 ha of fruit trees (pears, plums, olives and grape vines), which are irrigated from water in the dams on the property. The trees have a total water demand of 350,842 m³/a. The dam will be filled during winter, ensuring the required water supply during summer. Increasing the storage capacity in the Modderas Dam will provide buffer storage (water security).

Figure 4. Existing dams on Farm 1/66

*The details of the proposed project **(Figure 5**) are as follows:*

- *The storage capacity of the Modderas Dam will be increased to 310,000 m³.*
- *The dam wall will be extended from 13.8 m by 1.3 m to a maximum of 15.1m in height.*
- *The Modderas Dam embankment crest will be constructed to have a crossfall of 2% to the upstream face.*
- *The upstream face of the embankment will be protected with durable rip-rap to prevent wave erosion.*
- *The spillway channel, as well as the embankment downstream face, will be topsoiled and planted with indigenous grass.*
- *The existing pump station will be used.*
- *The existing outlet pipe will be extended (within the dam footprint), and a new bypass spillway constructed.*
- *The existing storage dam D2, with a capacity of 31,000 m³, will be decommissioned.*
- *Access to the dam will be off existing roads and farm roads (Figure 6).*
- *Disturbed agricultural areas during construction will be reinstated with appropriate contouring, and soil/crop covering will be prepared and retained.*

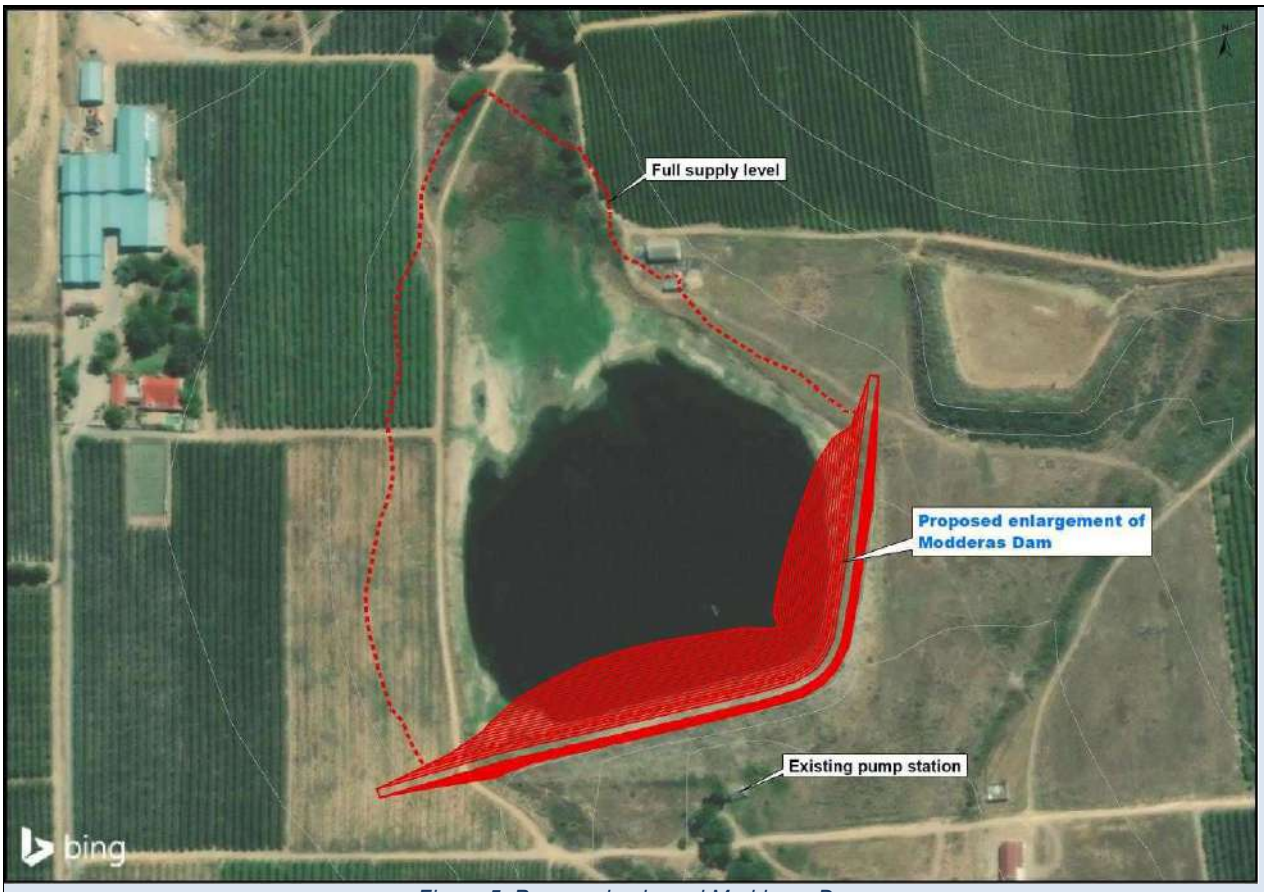


Figure 5. Proposed enlarged Modderas Dam.

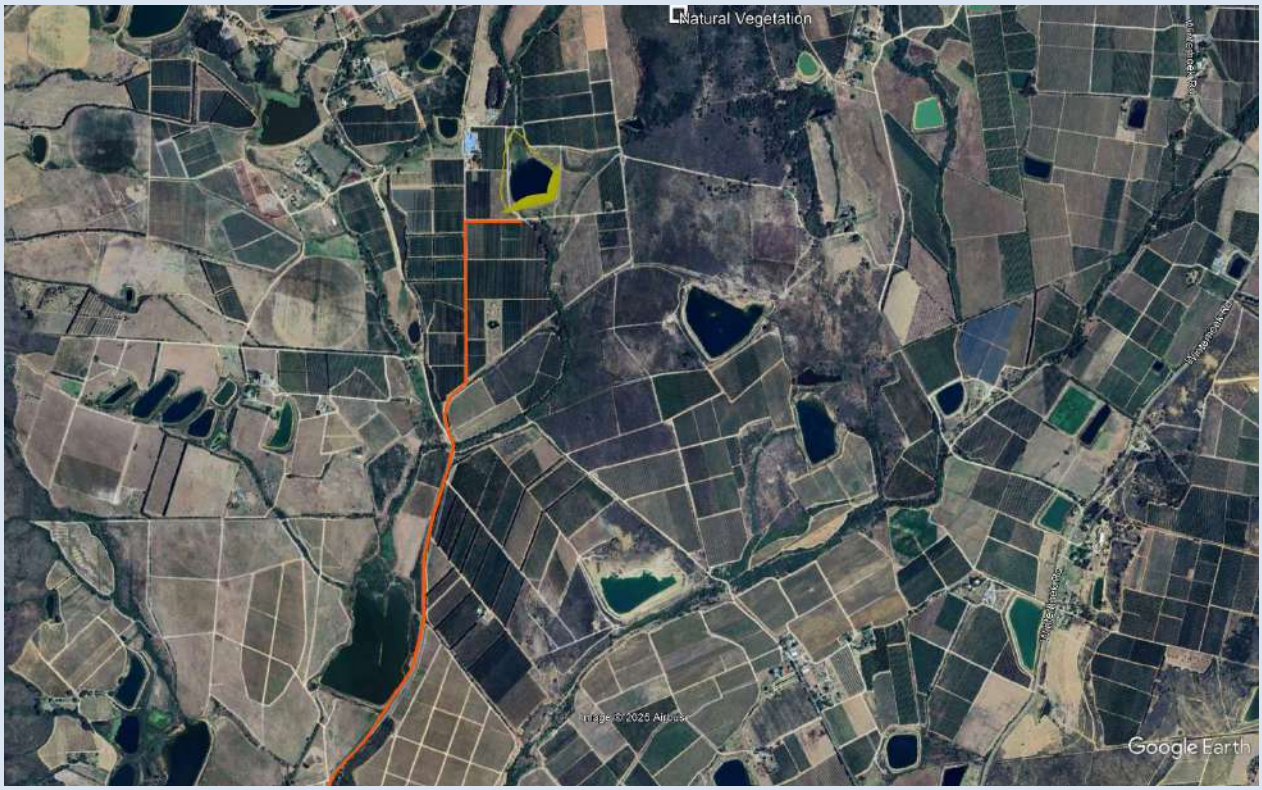


Figure 6. Existing access roads

The dam's footprint will thus be developed by an additional 2.2 ha in extent, with a total dam footprint area of 7.5 ha. The works will be undertaken within the footprint and full supply level of the proposed enlarged dam. A construction period of four months over the summer months is anticipated.

A dam with a wall height exceeding 5 m and a storage capacity greater than 50,000 m³ requires approval in terms of the Dam Safety Regulations. The dam safety application process will commence with an application for the classification of the Modderas Dam to determine the appropriate safety requirements and regulatory oversight. Once classified, a comprehensive design report, including detailed design drawings, will be prepared. Hagenbrink Consulting Engineers will manage these dam safety processes, which will begin should the EA and WULA processes be approved, ensuring that all necessary authorisations are in place before proceeding with construction.

Decommissioning of Dam D2 would involve leaving the dam as is and not storing any water in the dam, apart from natural runoff and rainwater. This will ensure that any surrounding vegetation is not disturbed.

Water rights

The property lies on the wide valley floor of the Klein Berg River that flows into the middle reaches of the Berg River System. The Modderas River that drains the site comprises several small foothill streams. The DWS have confirmed the farm's existing lawful use (ELU) of 421,470 m³ per annum, consisting of 363,460 m³ per annum for surface water and 58,010 m³ per annum for groundwater (the WARMS registration certificate 22043520 dated 21 November 2023 shows the validation and verification of water uses on Portion 1 of the Roode Zands Kloof Farm 66, Tulbagh, as FINAL in terms of the confirmation of the water users in terms of Section 35(4) of the NWA, 1998). Refer to ***Appendix G3c*** *for a copy of the Water Rights Certificate. The farm's current total storage capacity is 231,000 m³.*

Dam D2 failed a few years ago and can no longer store the 31,000 m³ it was designed to hold. After an assessment of the costs, it was decided to decommission Dam D2, thereby transferring the storage capacity of Dam D2 to the Modderas Dam.

It is further proposed to store an additional 79,000 m3 per annum from the stream in the upgraded dam, allowing the farm to access its Existing Lawful Water allocation. This equates to storing an additional 110,000 m³ in the Modderas Dam. It is proposed to store 60% of the additional surface water taking of 132,460 m³ into the Modderas Dam. Additional water taken from the stream will be measured to ensure that the water allocation is not exceeded.

Based on the summary above, the applicant would need to apply for an additional storage of 79,000 m³. This has been done in a Water Use Licence application (WULA).

The enlargement of Modderas Dam will not result in new water abstraction; as such, the Ecological Water Reserve (EWR) is considered not applicable in terms of the Water Use License Application. However, because Dam D2 will be decommissioned, all water from that stream will be available for the reserve, and a significant portion of the ecological reserve will be addressed from the stream in which Dam D2 is situated. If required, a specified percentage of the incoming water will be released from the Modderas Dam to ensure that the reserve will be addressed.

The WULA Application and the Aquatic Assessment are included in ***Appendix G3****.*

Catchment and Hydrology:

The property's aquatic features include non-perennial tributaries of the Roodezand River, which flows into the Klein Berg River, a major tributary of the larger Berg River System. The Modderas River, which empties into the Modderas Dam, originates in the foothills of the Groot Winterhoek Mountains and flows in a southerly direction through the property. Some other streams join the stream before its confluence with the Roodezant River. Seep wetlands are mapped along most of the streams within the property. The property falls within the jurisdiction of the Berg/Olifants WMA in the G10E quaternary catchment area.

The aquatic ecosystem assessment determined that the Modderas River is moderately to largely modified within its instream habitat and largely modified within its riparian zone. The river is of moderate ecological importance and sensitivity, with a target ecological condition of moderately modified.

Downstream users:

The Modderas Dam is an in-stream dam on the lower Modderas Tributary of the Klein Berg River. The tributary contributes less than 1% of the flow to the Klein Berg River. The enlarged dam would likely, however, be a greater than 1 Mean Annual Runoff (MAR) dam, which implies it will likely not spill every year, only in wetter-than-average years. The tributary that joins the Modderas River downstream of the dam in which Dam D2 is situated contributes about 40% of the flow in the lower river. The decommissioning of Dam D2 will therefore ensure the EWR contribution for the lower river from this tributary.

Additional environmental flow mitigation has been proposed to maintain the downstream watercourse (See Section G). The proposed decommissioning of Dam D2 must follow the mitigation measures to protect the wider riparian and seep area associated with the smaller tributary of the Modderas River. If the proposed EWR releases and mitigation measures are implemented, it will limit the impact on the water resource or any other downstream water user.

Maintenance:

The landowner will need to maintain the dam and associated water supply system, roads and other infrastructure crossing the watercourses periodically, as well as the watercourses within the property. A Maintenance Management Plan (MMP) in terms

of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA"), has been compiled by Toni Belcher to guide maintenance works on infrastructure and within the watercourses on the property concerned. See Annexure 6 of the EMPr attached as ***Appendix H****.*

The proposal may require certain maintenance management or repair activities during the operational phase. These activities may include:

- ***Clearing of alien vegetation***

Invasive alien species cause a decline in indigenous plant numbers, change the vegetation structure and reduce biotic and habitat diversity. The removal of invasive alien plants from aquatic habitats is desirable not only from an aquatic ecological perspective but also because they reduce the ability of that ecosystem to provide valued goods and services as alien vegetation reduces runoff and water availability; increases the instability and erosion potential of banks, modify water quality; reduce biodiversity; result in much hotter and more destructive fires which destroy indigenous seeds and are difficult to control; form barriers to the movement of biota and have economic consequences. The main invasive alien vegetation currently occurring within the disturbed areas on the farm include black wattle (Acacia mearnsii), blackwood (Acacia melanoxylon), sesbania (Sesbania punicea) and bramble (Rubus flagellaris).

- ***Clearing of nuisance growth of indigenous aquatic vegetation***

Common Phragmites australis reeds and Typha capensis bulrushes are indigenous plants with an ecological function. They offer a degree of refuge and habitat for biota as well as providing essential ecological services such as reducing erosion, causing deposition of silt, cooling instream habitats and reducing wind, thereby reducing evaporation. It is thus essential that where natural vegetation exists, it should be retained as far as possible and disturbed areas should be rehabilitated. Therefore, the objective of this activity is to control the reeds or bulrushes and not to eradicate them out of the river channel.

Phragmites reed and Typha bulrush growth, in general, need to be managed in rivers within developed areas where the natural control measures such as floods or grazing have largely been removed and there is an elevated supply of nutrients. The removal of these plants is thus periodically undertaken to maintain an open channel and ensure that high flows in the channel are unimpeded. The control of indigenous reeds, in particular, needs to be undertaken very judiciously, with careful control and consideration for the environment. ***Control*** *should only aim to remove excessive nuisance plant growth and build-up of material that can cause flooding. These reeds are indigenous and must not be* ***eradicated*** *as they provide valued goods and services.*

The primary impact of clearing reeds and bulrushes is the disturbance of riparian and aquatic habitats. The control or clearing of these plants is probably only required within the dams and water infrastructure. Any clearing of nuisance reeds within the watercourses is recommended to be cleared by hand, which would result in a very low impact. Secondary impacts would be the potential to facilitate erosion and the potential to facilitate the invasion of the area by alien plant species within the cleared areas. Furthermore, the reduction in surface roughness can result in erosion of the channel.

- ***Repairs to infrastructure***

The impact of repair work on the infrastructure within the watercourse will vary, largely depending on the level of repairs required and how the repairs are conducted. The sensitivity of the aquatic ecosystem is also an important consideration. This maintenance activity entails the smaller-scale repairing of infrastructure so that it can retain its original footprint and integrity, a like–for–like scenario. Any additions to infrastructure are, by definition, not within the scope of an MMP. Minor repairs will typically involve a localised disturbance of the river channel or banks while infrastructure is repaired. The disturbed areas following repairs can contribute towards high silt and sediment loads within the river as the material is not held by the roots of plants.

- ***Sediment removal at infrastructure***

During high flows, watercourses transport sediment particles and debris downstream. As the energy in the watercourse decreases (typically in pools or instream impoundments), the sediment and debris are deposited. If the watercourse channel becomes too full of sediment, it needs to be physically removed. Sediment and other materials often need to be removed to access infrastructure or to ensure that the infrastructure operates efficiently. The clearing of sediment at infrastructure can result in a localized disturbance within the riparian and aquatic habitats of the river. This disturbance can result in erosion and invasion by alien plants in the disturbed area.

- ***Sediment removal from the channel for flood conveyance/channelisation***

Larger scale deposition of sediment within watercourses can block or alter/impede flow in the watercourse, causing erosion and damage to the riverbanks and adjacent land or infrastructure. It may thus become necessary to remove sediment from the watercourse channel to prevent flood damage. Larger-scale sediment removal is likely to require advice from someone knowledgeable in river hydraulics to ensure that the work does not cause further damage to the integrity of the watercourse channel.

- ***Repairs to riverbanks and associated bank stabilization infrastructure***

The dynamic nature of a river results in erosion of the channel and banks and damage to infrastructure along the banks. The eroding or flood-damaged banks and adjacent areas may then need to be repaired to protect adjacent farmlands and infrastructure.

Foundation And Construction Materials:

*Seven test pits were excavated at the dam site at the locations shown in **Figure 7**. The test pits were excavated to assess the nature of the underlying foundation, to investigate the properties of available materials and to determine the suitability of these materials for use in the proposed dam enlargement. Three samples were collected for laboratory testing.*

Figure 7. Test pit locations.

The soils underlying the dam site generally comprise a thick layer of fine silty sand, which is underlain by a variable thickness of sandy lean clay, which grades to a weathered shale. The proposed dam enlargement will require a core trench on both flanks where the embankment is extended. The core trench is expected to be founded on weathered shale. According to the applicant, no seepage has been observed at the existing Modderas Dam, which indicates that the existing embankment's core trench was taken to a solid foundation.

The core trench should be excavated to a depth of ±6 m below ground level into an acceptable solid foundation. Soft, weak, coarse and organic materials must be removed during excavation to reduce foundation seepage. The core trench must be backfilled and compacted with the most impervious material available on site.

Sandy lean clay, which is typically a good choice of core material, is available in the dam basin at test pits TP2 and TP6. Elastic silt material is present in TP4 and TP5, which can also be used as a core material when combined with other materials.

The available core materials found at the dam site are considered acceptable core material based on the following properties in comparison to Druyts ' 1988 guidelines.[1]

- *% Fines range from 53% to 86%*
- *% Clay ranges from 4% to 17%*
- *Plasticity Index ranges from 13 to 19*

[1] *Druyts, F., 1988. Paper submitted on Embankment Dams for Dam Design Course. 1988.*

- *Classifications of CL and CH are considered acceptable*

The dispersivity of the proposed core material, which was determined with the SCS Double Hydrometer Test, resulted in a range of dispersivity from 0 to 91% for the three test samples. TP6 results indicate non-dispersivity, while TP2 and TP4's results indicate the material is highly dispersive. Due to the varying dispersivity of the tested material, core compaction to a minimum 98% of the Standard Proctor maximum density at a moisture content between Optimum Moisture Content (OMC) and +3% OMC is recommended.

Permeability tests were conducted on all three samples at 98% Proctor density, and the following were achieved:

- *TP2: 1.449 x 10-6 cm/s*
- *TP4: 3.887 x 10-7 cm/s*
- *TP6: 2.201 x 10-7 cm/s*

The permeability tests at 98% Proctor density show that the samples are practically impervious, with drainage being imperceptible.

All the materials required for the enlargement of Modderas Dam will be obtained for the basin. Additional rip-rap material will be sourced from the irrigation areas on the farm.

Further geotechnical testing (Proctor density, permeability, shear strength, etc) should be carried out during construction.

*Refer to **Appendix G1** for a copy of the Dam Engineers Report.*

4.5.	Indicate how access to the proposed site(s) will be obtained for all alternatives.																					
*Access to the dam will be off existing roads and farm roads (**Figure 6**). All alternatives considered will use the same access roads.*																						
4.6.	SG Digit code(s) of the proposed site(s) for all alternatives: Farm 1/66	***C***	***0***	***7***	***5***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***6***	***6***	***0***	***0***	***0***	***0***	***1***
	Farm 329	***C***	***0***	***7***	***5***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***3***	***2***	***9***	***0***	***0***	***0***	***0***	***0***
4.7.	Coordinates of the proposed site(s) for all alternatives:																					
	Latitude (S)							***33°***					***12'***			***34.19"***						
	Longitude (E)							***19°***					***7'***			***21.53"***						

SECTION C: LEGISLATION/POLICIES AND/OR GUIDELINES/PROTOCOLS

1. Exemption applied for in terms of the NEMA and the NEMA EIA Regulations

Has an exemption been applied for in terms of the NEMA and the NEMA EIA Regulations? If yes, include a copy of the exemption notice in Appendix E18.	YES	***NO***

2. Is the following legislation applicable to the proposed activity or development?

The National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008) ("ICMA"). If yes, attach a copy of the comment from the relevant competent authority as Appendix E4 and the pre-approval for the reclamation of land as Appendix E19.	YES	***NO***
The National Heritage Resources Act, 1999 (Act No. 25 of 1999) ("NHRA"). If yes, attach a copy of the comment from Heritage Western Cape as Appendix E1. *This application relates to the expansion of an existing dam on an operational farm within a farming area. See Appendix F8 for correspondence from HWC that there are no heritage triggers.*	*YES*	**NO**
The National Water Act, 1998 (Act No. 36 of 1998) ("NWA"). If yes, attach a copy of the comment from the DWS as Appendix E3. *Refer to **Appendix G3c** for a copy of the Water Rights Certificate. The WULA Report is included as **Appendix G3a**.*	***YES***	NO
The National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) ("NEM: AQA"). If yes, attach a copy of the comment from the relevant authorities as Appendix E13.	YES	***NO***
The National Environmental Management Waste Act (Act No. 59 of 2008) ("NEM:WA")	YES	***NO***
The National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004 ("NEMBA"). *Comment will be requested from CapeNature. The site is transformed by the existing dam, crops and general agricultural disturbances. The expansion will occur to the west (loss of crops) and slightly to the north and east. The land to the north is riparian in nature and the land to the east fallow farmland. Minimal to no loss of natural vegetation will occur.*	YES	***NO***
The National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) ("NEMPAA").	YES	***NO***
The Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983). If yes, attach a comment from the relevant competent authority as Appendix E5. *Comment will be requested from the Department of Agriculture. The site consists of an existing dam with fallow land to the east and crops to the west. While some of the crops will be lost for the proposed dam expansion, it is envisaged that approximately only 0.55ha of existing planted crops will be lost and a CARA application is thus not required.*	YES	***NO***

3. Other legislation

Dam Safety *The required dam safety process will commence with the application for classification of the proposed enlarged dam. The current classification as a Category II Medium sized dam with a significant hazard potential rating is expected to remain unchanged.A dam classification application will be submitted to the Dam Safety Office once design is finalised.*

4. Policies

Explain which policies were considered and how the proposed activity or development complies with and responds to these policies.
The proposed property is zoned Agriculture, and the proposed activity is therefore permitted in terms of the land use rights of the property.

5. Guidelines

List the guidelines which have been considered relevant to the proposed activity or development, and explain how they have influenced the development proposal.	
DEA&DP's EIA Guideline and Information Document Series	*Applied to various components in the Basic Assessment process. The following guidelines were considered throughout this Basic Assessment process:* • *Guidelines for EIA Requirements*

	• *Guidelines for Public Participation* • *Guidelines on Alternatives* • *Guideline on Need and Desirability* • *Guideline for Involving Biodiversity Specialists in EIA Processes* • *Guideline for Environmental Management Plans*
DEA&DP's Circular EADP 0028/2014: "One Environmental Management System"	*This circular provides further detail and clarity on the procedure to be followed during the Basic Assessment process, specifically under the EIA Regulations 2014, as amended.*

6. Protocols

Explain how the proposed activity or development complies with the requirements of the protocols referred to in the NOI and/or application form.
The EIA Protocols comprise procedures to be followed for the Assessment and Minimum Criteria for Reporting of Identified Environmental Themes, when applying for Environmental Authorisation. The theme relevant to this application is ***Aquatic Biodiversity****.* *An Aquatic Specialist was appointed to assess and investigate the potential impacts of the proposed enlarged dam on any nearby watercourses.* *For more information relating to the protocols recommended by the National Screening Tool, refer to the Site Sensitivity Verification Report (****Appendix L****).*

SECTION D: APPLICABLE LISTED ACTIVITIES

List the applicable activities in terms of the NEMA EIA Regulations.

Activity No(s):	Provide the relevant **Basic Assessment Activity(ies)** as set out in **Listing Notice 1**	Describe the portion of the proposed development to which the applicable listed activity relates.
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, 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 in accordance with 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.*	*More than 10 cubes of material will be moved and excavated within the watercourse to expand the existing instream dam.*
48	*The **expansion** of-.* *(i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more; or* *(ii) dams or weirs, where the dam or weir, including infrastructure and water surface area, is expanded by 100 square metres or more;* *where such expansion 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 expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;* *(bb) where such expansion 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 23 in Listing Notice 3 of 2014, in which case that activity applies;* *(dd) where such expansion occurs within an urban area; or* *(ee) where such expansion occurs within existing roads, road reserves or railway line reserves.*	*The existing dam and associated infrastructure will be expanded by more than 100 m². The dam footprint will be expanded by 2.2 ha. This will occur within a watercourse and within 32 m of a watercourse, since the dam is an instream dam.*
Activity No(s):	Provide the relevant **Basic Assessment Activity(ies)** as set out in **Listing Notice 3**	Describe the portion of the proposed development to which the applicable listed activity relates.
23	*The **expansion** of-* *(i) dams or weirs where the dam or weir is expanded by 10 square metres or more; or* *(ii) infrastructure or structures where the physical footprint is expanded by 10 square metres or more;* *where such expansion occurs –* *(a) within a watercourse;* *(b) in front of a development setback adopted in the prescribed manner;* *(c) or if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;* *excluding the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.*	*The dam will be expanded by more than 10m², outside an urban area. There are patches identified as CBAs within the existing dam basin and dam embankment.*

Note:
- The listed activities specified above must reconcile with the activities applied for in the application form. The onus is on the Applicant to ensure that all applicable listed activities are included in the application. If a specific listed activity is not included in an Environmental Authorisation, a new application for Environmental Authorisation will have to be submitted.
- Where additional listed activities have been identified that have not been included in the application form, an amended application form must be submitted to the competent authority.

List the applicable waste management listed activities in terms of the NEM:WA

Activity No(s):	Provide the relevant **Basic Assessment Activity(ies)** as set out in **Category A**	Describe the portion of the proposed development to which the applicable listed activity relates.
	N/A	

List the applicable listed activities in terms of the NEM:AQA.

Activity No(s):	Provide the relevant **Listed Activity(ies)**	Describe the portion of the proposed development to which the applicable listed activity relates.
	N/A	

SECTION E: PLANNING CONTEXT AND NEED AND DESIRABILITY

1.	Describe the preferred alternative.

The preferred alternative is as described in previous sections and summarised here.

The existing Modderas Dam is an in-stream dam on the Modderas River. The dam has a maximum capacity of 200,000 m³ and a wall height of 13.8 m. The intention is to increase the capacity of the Modderas Dam to 310,000 m³ and decommission Dam 2 nearby. Increasing the storage capacity in the Modderas Dam will provide buffer storage (water security) for the irrigation of fruit trees on the farm.

The details of the proposed project are as follows:

- *The storage capacity of the Modderas Dam will be increased to 310,000 m³.*
- *The dam wall will be extended from 13.8 m by 1.3 m to a maximum of 15.1m in height.*
- *The Modderas Dam embankment crest will be constructed to have a crossfall of 2% to the upstream face.*
- *The upstream face of the embankment will be protected with durable rip-rap to prevent wave erosion.*
- *The spillway channel, as well as the embankment downstream face, will be topsoiled and planted with indigenous grass.*
- *The existing pump station will be used.*
- *The existing outlet pipe will be extended, and a new bypass spillway constructed.*
- *The existing storage dam D2, with a capacity of 31,000 m³, will be decommissioned.*
- *Access to the dam will be off existing roads and farm roads.*
- *Disturbed agricultural areas during construction will be reinstated with appropriate contouring, and soil/crop covering will be prepared and retained.*

2.	Explain how the proposed development is in line with the existing land use rights of the property, as you have indicated in the NOI and application form? Include the proof of the existing land use rights granted in Appendix E21.

The site is zoned agricultural, and the proposed activity is in keeping with the existing agricultural activities on the property and permitted in terms of the land use rights of the property. The application is for the expansion of an existing farm dam to supply irrigation water to cultivated lands. The enlarged dam will store water that has already been confirmed as existing lawful use (ELU). A total of 421,470 m³ per annum was confirmed, consisting of 363,460 m³/a for surface water and 58,010 m³/a for groundwater.

3.	Explain how potential conflict with respect to existing approvals for the proposed site (as indicated in the NOI/and or application form) and the proposed development has been resolved.

There is no conflict.

4.	Explain how the proposed development will be in line with the following?
4.1	The Provincial Spatial Development Framework.

The proposed development involves the construction of an enlarged farm dam for irrigation purposes on land zoned for agricultural use. The proposed development will enhance the economic value and viability of the farm, thereby contributing to the area's economic growth. The proposed development is therefore aligned with the objectives of the PSDF and does not compromise any of the objectives of the PSDF.	
4.2	The Integrated Development Plan of the local municipality.
This application is for the expansion of an existing farm dam on an operational farm.	
4.3.	The Spatial Development Framework of the local municipality.
This application is for the expansion of an existing farm dam on an operational farm.	
4.4.	The Environmental Management Framework applicable to the area.
According to the Screening Report (Appendix I), the site does not intersect with an Environmental Management Framework (EMF).	
5.	Explain how comments from the relevant authorities and/or specialist(s) with respect to biodiversity have influenced the proposed development.
Comments obtained from the relevant authorities during the pre-application public participation process (PPP) are included in the Draft BAR. *The recommendations and mitigation measures provided by the specialist are included in this report and will become conditions of approval, should the application be granted.* *A number of aspects raised by CapeNature have been included in the EMPr.*	
6.	Explain how the Western Cape Biodiversity Spatial Plan (including the guidelines in the handbook) has influenced the proposed development.
The Western Cape Biodiversity Spatial Plan 2023 identifies fragments of Teresstrial CBA 1 and CBA 2 wtihin the existing dam basin, on the embankment of the existing dam and a small fragment upstream of the dam, overlapping the dam basin. The reasons for these CBAs maybe due to the historically identified vegetation that may have occurred on site. The proposed expansion will result in little to no loss of natural vegetation. There are no ESAs identified on site and the watercourse within which the dam is built is identified as a NFEPA wetland. *It was therefore decided to appoint an Aquatic Specialist to investigate the potential impacts on the stream. Furthermore, expansion into disturbed agricultural lands was considered favourable from an ecological perspective and no botanical input was needed. Dam D2 will be decommissioned and the water it currently captures will be allowed to flow where it joins with the stream downstream of the Modderas Dam.* *Refer to the **Figure 8** below.*	

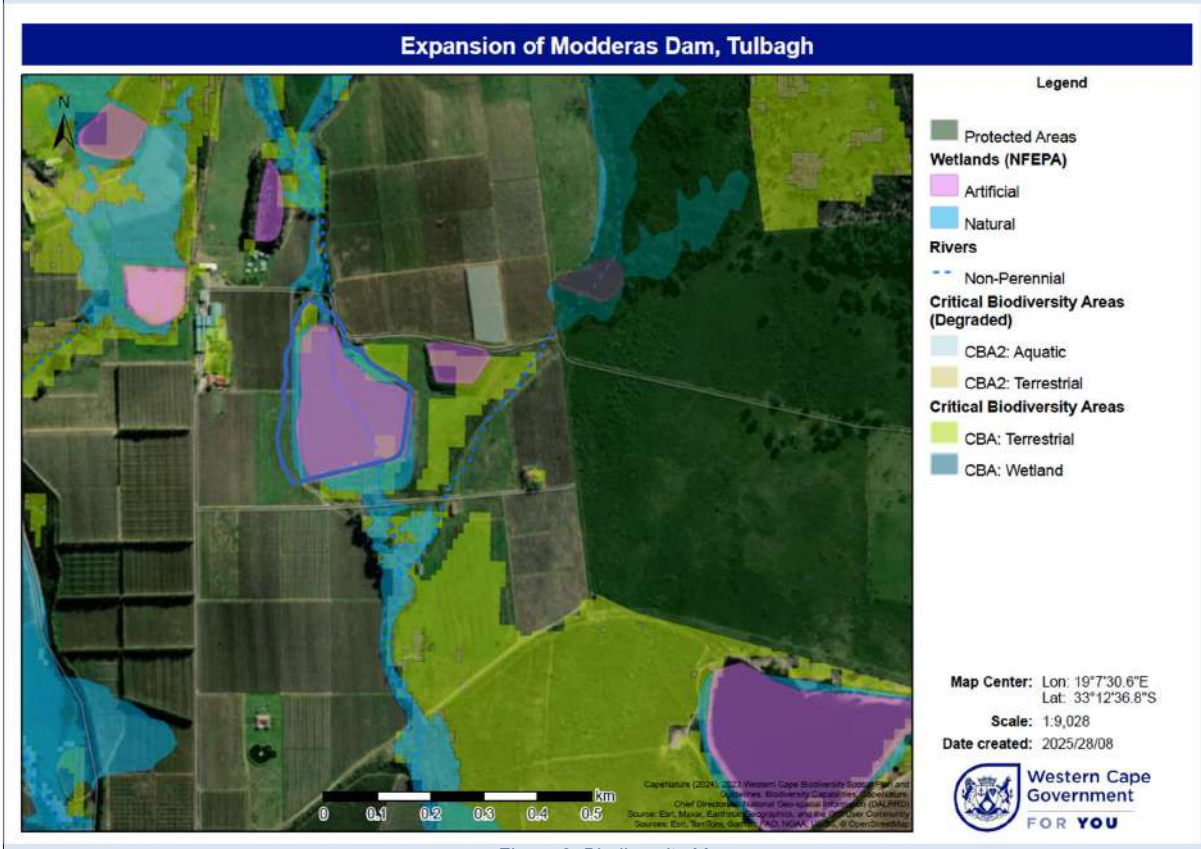


Figure 8. Biodiversity Map.

7.	Explain how the proposed development is in line with the intention/purpose of the relevant zones as defined in the ICMA.
N/A The proposed development is not located in any coastal zones as defined in the ICMA.	
8.	Explain whether the screening report has changed from the one submitted together with the application form. The screening report must be attached as Appendix I.
*Yes the Screening Tool Report has changed slightly. Originally the site was shown to have a medium sensitive agricultural sensitivity with only patches of very high sensitivity. The updated Screening Report shows the entire site as a very high agricultural sensitivity. Other than that, no further changes were noted. Refer to **Appendix I** for a copy of the updated Screening Tool Report.*	
9.	Explain how the proposed development will optimise vacant land available within an urban area.
The site is located outside the urban edge. However, the expansion of a farm dam on a working farm is acceptable provided there are no significant environmental impacts.	
10.	Explain how the proposed development will optimise the use of existing resources and infrastructure.
The existing dam will be enlarged rather than building an additional dam elsewhere, and a second in-stream dam on the farm will be decommissioned, releasing water into the river downstream. In addition, clay required for the dam expansion will be taken from within the dam basin.	
11.	Explain whether the necessary services are available and whether the local authority has confirmed sufficient, spare, unallocated service capacity. (Confirmation of all services must be included in Appendix E16).
This application relates to the enlargement of an existing farm dam. No services are required. The farm has sufficient electricity available for any additional pumping requirements.	
12.	In addition to the above, explain the need and desirability of the proposed activity or development in terms of this Department's guideline on Need and Desirability (March

	2013) or the DEA's Integrated Environmental Management Guideline on Need and Desirability. This may be attached to this BAR as Appendix K.
*Refer to **Appendix K.***	

SECTION F: PUBLIC PARTICIPATION

The Public Participation Process ("PPP") must fulfil the requirements as outlined in the NEMA EIA Regulations and must be attached as Appendix F. Please note that if the NEM: WA and/or the NEM: AQA is applicable to the proposed development, an advertisement must be placed in at least two newspapers.

1. Exclusively for linear activities: Indicate what PPP was agreed to by the competent authority. Include proof of this agreement in Appendix E22.

N/A

2. Confirm that the PPP, as indicated in the application form, has been complied with. All the PPP must be included in Appendix F.

Two rounds of public participation will be conducted. The following steps will be undertaken:

Pre-Application Phase

- *The pre-application Basic Assessment Report (BAR) was made available for a 30-day commenting period to potential I&APs, State Departments and Organs of State with jurisdiction in the area, from **3 October to 5 November 2025.** The list of I&APs are included as **Appendix F1.***
- *The intention was to notify all potential I&APs, neighbouring landowners, and occupiers of land adjacent to the site, by -*
    - *Sending notification letters to all immediate neighbours, relevant State Departments, CapeNature, Municipalities, ward councillor, water users associations and environmental groups in the area. The letter informed the public and State Departments of the availability of the report for comment, where the report could be accessed and the timeframes of the commenting period. The notification letter and proof of notification is included as **Appendix F2**.*
    - *A direct link or a CD copy of the Pre-Application BAR was sent to relevant State Departments and Organs of State. Their comments were requested in terms of Section 24O of NEMA. Proof of notifying State Departments and Organs of State are included as **Appendix F3**.*
    - *Landowners/farmers were asked to notify those living on their farms of the proposal, where they could find the report and how they could comment.*
    - *An Afrikaans advertisement was placed in the Witzenberg Herald on **3 October 2025,** informing the public of the proposal, where to find the report and how to comment. Refer to **Appendix F4**.*
    - *An English site notice was placed along the access road to the farm, informing passers-by of the proposal, where to find the report and how to comment. A copy of the site notice, evidence of the site notice placed on site and the location is detailed in **Appendix F5.***
    - *The pre-application BAR and an executive summary was made available on Earth Grace website (www.earthgrace.co.za). The executive summary, the main report and appendices were made available as separate links.*
- *All comments received during this commenting period are attached as **Appendix F6** and have been responded to in the comments and response (C&R) report (**Appendix F7**). Refer to **Table 1 in the C&R Report** for a summary of the comments and the project team's responses to the comments.*
- *Additional correspondence with State Departments is attached as **Appendix F8**.*

Statutory Phase

After submission of the application form, Registered I&APs and relevant State Departments and Organs of State will have another opportunity to comment on the draft BAR. No extensions will be allowed during the commenting period as a result of these strict timeframes. Below is a summary of the PPP that will be undertaken as part of the statutory process.

- *The draft BAR will be made available for another 30-day commenting period.*
- *The report will be uploaded to the Earth Grace website. All appendices, the main report, and the executive summary will be available as separate links.*
- *Registered I&APs and State Departments will be notified via email of the availability of the draft BAR.*
- *All comments received during the 30-day comment period will be included in the final BAR. All comments received will be responded to in the comments and response (C&R) report, which will also be included in the final BAR.*
- *The final BAR will then be submitted to the DEA&DP for their decision*

3. Confirm which of the State Departments and Organs of State indicated in the Notice of Intent/application form were consulted with.

Provincial Department of Agriculture
Landuse: Elsenburg
Attention: Cor van der Walt
Private Bag X1
Elsenburg
7607
Email: corvdw@elsenburg.com

Department of Agriculture: Land Care
Attention: Rudolph Röscher
PO Box 66
Worcester
6849
Tel: 083 675 1315
Email: rudolphr@elsenburg.com

National Department of Agriculture, Land Reform and Rural Development
Attention: Rahab Ramukhesa
19 Strand Street, Siyaya Building
Bellville
Tel: 021 944 1422
Email: RahabM@Dalrrd.gov.za

CapeNature
Attention: Leandra Knoetze
Conservation Operations: Landscape Conservation Intelligence Management Unit Assegaaibosch Nature Reserve
Jonkershoek Road
Stellenbosch
Email: lknoetze@capenature.co.za

Department Water and Sanitation: BOCMA
Attention: Elkerine Rossouw
Cnr of Mountain Mill and East Lake Roads
Worcester
6850
Tel: 023 346 8000
Email: erossouw@bocma.co.za

Witzenberg Municipality
Attention: David Nasson
50 Voortrekker St
Ceres
6835
Email: david@witzenberg.gov.za

Cape Winelands Municipality
Attention: Municipal Manager
Tel: 021 888 5272
Email: mm@capewinelands.gov.za

Ward Councillor (Ward 11)
Attention: Elizabeth Sidego
Email: esidego@witzenberg.gov.za

Tulbagh Water Users Association
Attention: Schalk Albertyn
Email: b.albertyn@gmail.com

4. If any of the State Departments and Organs of State were not consulted, indicate which and why.

*All the State Departments and Organs of State listed above have been consulted. Proof of consultation with State Departments and Organs of State are included in **Appendices F3 and F8**.*

5. If any of the State Departments and Organs of State did not respond, indicate which.

> *The Department of Water and Sanitation did not respond nor did the Department of Agriculture. Should their comment be submitted later, it will either be included in the Final BAR or sent directly to DEA&DP.*

6. Provide a summary of the issues raised by I&APs and an indication of the manner in which the issues were incorporated into the development proposal.

> *Please refer to Table 1 in the Comments and Response Report included as **Appendix F7**.*

Note:

A register of all the I&AP's notified, including the Organs of State, and all the registered I&APs must be included in Appendix F. The register must be maintained and made available to any person requesting access to the register in writing.

The EAP must notify I&AP's that all information submitted by I&AP's becomes public information.

Your attention is drawn to Regulation 40 (3) of the NEMA EIA Regulations which states that *"Potential or registered interested and affected parties, including the competent authority, may be provided with an opportunity to comment on reports and plans contemplated in subregulation (1) prior to submission of an application but **must** be provided with an opportunity to comment on such reports once an application has been submitted to the competent authority."*

All the comments received from I&APs on the pre-application BAR (if applicable and the draft BAR must be recorded, responded to and included in the Comments and Responses Report and must be included in Appendix F.

All information obtained during the PPP (the minutes of any meetings held by the EAP with I&APs and other role players wherein the views of the participants are recorded) must be included in Appendix F.

Please note that proof of the PPP conducted must be included in Appendix F. In terms of the required "proof", the following is required:

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

SECTION G: DESCRIPTION OF THE RECEIVING ENVIRONMENT

All specialist studies must be attached as Appendix G.

1. Groundwater

1.1.	Was a specialist study conducted?	YES	**NO**
1.2.	Provide the name and or company that conducted the specialist study.		
No specialist study was undertaken, as the proposal is not predicted to impact groundwater resources.			
1.3.	Indicate above which aquifer your proposed development will be located and explain how this has influenced your proposed development.		
A major fractured aquifer occurs within the area. Due to the underlying geology, both the surface and groundwater quality tend to have relatively low levels of salinity with natural electrical conductivity concentrations of less than 70 mS/m. The recharge of the aquifer is estimated to be about 70 mm/a, and the aquifer is of high susceptibility and vulnerability to pollution from anthropogenic activities. As the aquifer is located approximately 11 m below ground level, the proposed enlarged dam will not have any significant impacts on the groundwater.			
1.4.	Indicate the depth of groundwater and explain how the depth of groundwater and the type of aquifer (if present) have influenced your proposed development.		
A major fractured aquifer occurs within the area, with the water table typically occurring at depths of about 11 m below ground level and a yield of more than 5 litres a second. The proposed dam will not be filled with groundwater.			

2. Surface water

2.1.	Was a specialist study conducted?	***YES***	NO
2.2.	Provide the name and/or company that conducted the specialist study.		
Toni Belcher - BlueScience			
2.3.	Explain how the presence of watercourse(s) and/or wetlands on the property(ies) has influenced your proposed development.		

AQUATIC FEATURES

The Modderas River rises on the lower slopes of the Groot Winterhoek Mountains (±565 m above sea level) and flows about 3.9 km to join the Roodezant River at 207 m, with an average slope of 1%. The dam is situated mid-reach at about 250 m, just upstream of another tributary. The study area falls within a broader zone of ***Very High Aquatic Biodiversity Sensitivity****, due to the presence of Aquatic CBAs, FEPA wetlands, and the Boland Strategic Water Source Area. The property lies on the valley floor of the Klein Berg River. The in-stream dam is on the Modderas River, which drains into the Roodezand River, a tributary of the Klein Berg within the Berg River System (Quaternary catchment G10E).See* ***Figure 9****.*

Within the farm, much of the valley floor vegetation has been transformed by agriculture. At the site, the Modderas River comprises small foothill streams with a defined riparian zone of both indigenous and alien vegetation within the already modified valley floor.

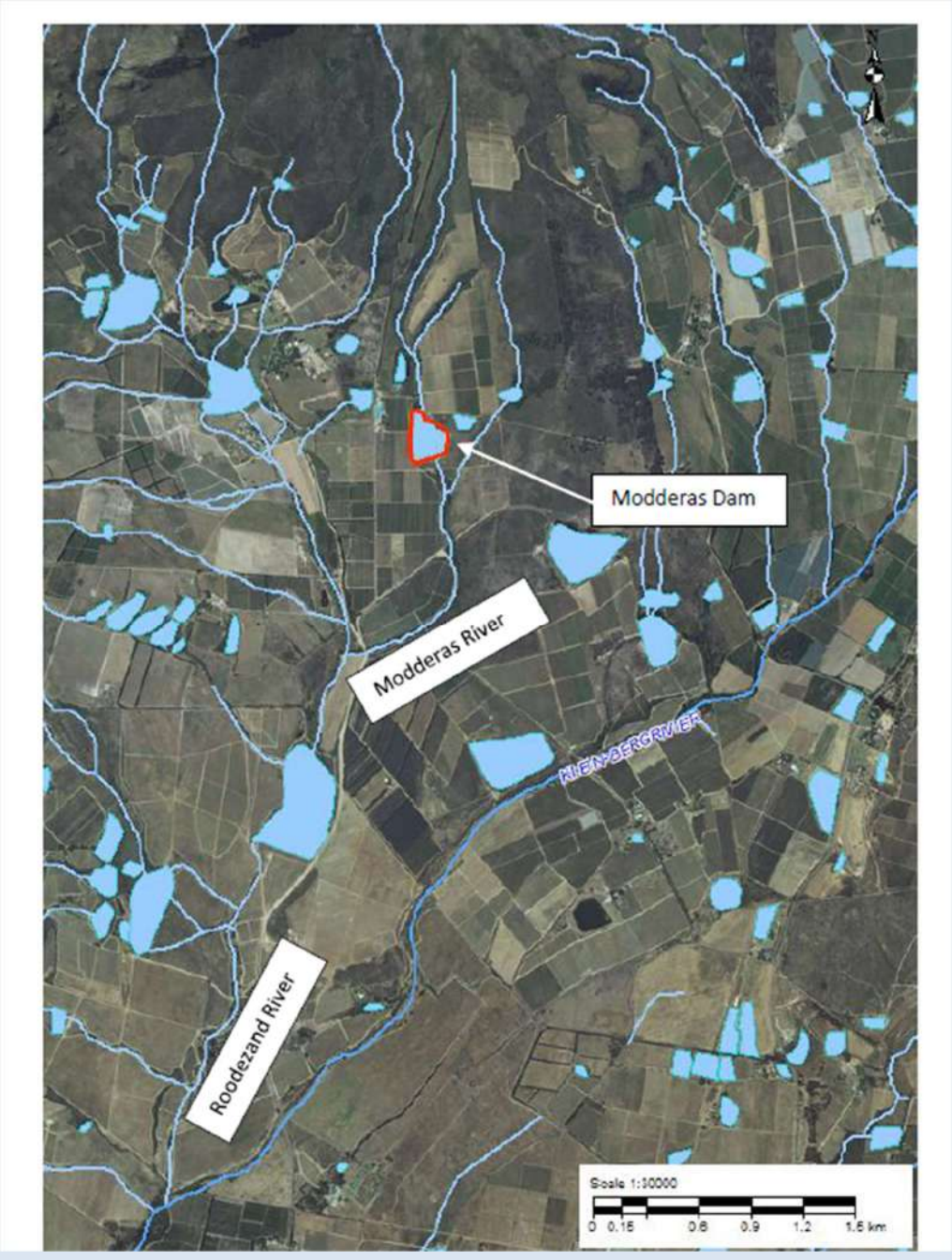


Figure 9. Orthophotograph taken in 2016 with the river system associated with Modderas Dam.

The property's aquatic features include non-perennial tributaries of the Roodezand River, which flows into the Klein Berg River, a major tributary of the larger Berg River System. The Modderas River, which drains into the Modderas Dam, originates in the foothills of the Groot Winterhoek Mountains and flows in a southerly direction through the property. Some other streams join the stream before its confluence with the Roodezant River. A seep wetlands are mapped along most of the streams within the property.

ASSESSMENT OF FRESHWATER FEATURES AND THEIR SIGNIFICANCE

*The **Index for Habitat Integrity (IHI)** and **Site Characterisation Assessments** were used to evaluate the ecological condition of the Modderas River. No detailed geomorphology, fish or aquatic biota surveys were undertaken, and aquatic habitat integrity was estimated through desktop methods.*

*The river, fed by small streams and seeps from the Groot Winterhoek foothills, has a limited catchment supplied mainly by groundwater. Surrounding landscapes and riparian zones have long been modified by agriculture, often extending into the watercourses. Upstream of Modderas Dam, habitats are mostly wetlands with alien-invaded riparian vegetation, while downstream, the cobble-bed stream flows through agricultural land heavily altered by past cultivation. Many seep wetlands have been lost. Site photographs are shown in **Appendix C.***

Invasive species present include black wattle, blackwood, sesbania and bramble. Indigenous riparian vegetation still occurs, with species such as Psoralea pinnata, Searsia angustifolia, Olea europaea subsp. africana, Podocarpus elongatus, Zantedeschia aethiopica and Ficinia nodosa.

Amphibians include Cape River Frog, Clicking Stream Frog, Mountain Rain Frog and Raucous Toad, all listed as Least Concern. Indigenous fishes expected in the Klein Berg River system include Cape galaxias, Cape kurper and the Endangered Berg River redfin. However, dams, alien fish and loss of flow have reduced their upstream distribution.

Historical imagery shows that by 1948, the farm and streams had already undergone significant modification, with cultivation encroaching on wetlands and altering channels. By 1972, Modderas Dam and adjacent dams were established, and later imagery (2002–2023) indicates ongoing cultivation and maintenance of this modified condition.

SITE CHARACTERISATION

The geomorphological and physical characteristics of the tributary assessed from the Site Characterisation assessment are classified together as indicated in Table 1.

Table 1. Geomorphological and Physical features

River	Modderas River
Valley Form	Lower foothill
Lateral mobility or entrenchment	Confined by topography – more confined in upper reaches becoming less confined
Channel form	Simple
Channel pattern	Moderate to low sinuosity
Channel type	Boulder/cobble bed
Hydrology	Non-perennial

INDEX OF HABITAT INTEGRITY

Evaluation of the Index of Habitat Integrity (IHI) provides a measure of the degree to which a river has been modified from its natural state, based on the methodology from DWAF (1999). The in-stream habitat integrity of the Modderas River is considered to be moderately to largely modified (Category C to D in terms of the DWF methodology). In contrast, the riparian habitat has been largely modified (Category D). This is primarily due to the impact of the dams on the flow of the watercourses, as well as the encroachment of the surrounding land activities into the riparian habitat of the watercourses.

ECOLOGICAL IMPORTANCE AND SENSITIVITY (EIS)

The EIS assessment considers a number of biotic and habitat determinants surmised to indicate either importance or sensitivity. The determinants are rated according to a four-point scale. The median of the resultant score is calculated to derive the EIS category (EISC).

The Modderas River is considered of moderate ecological importance and sensitivity, as indicated in

Table 2. This indicates that the river reaches are unique on a provincial or local scale due to biodiversity. Such rivers are not usually susceptible to flow modifications and often have substantial capacity for use.

Table 2. Scale used to assess biotic and habitat determinants, indicating either importance or sensitivity, and the EIS assessment for the Modderas River.

Scale	Definition
1	One species/taxon judged as rare or endangered at a local scale.
2	More than one species/taxon judged to be rare or endangered on a local scale.
3	One or more species/taxon judged to be rare or endangered on a Provincial/regional scale.
4	One or more species/taxon judged as rare or endangered on a National scale (i.e. SA Red Data Books)

Biotic Determinants	Modderas River
Rare and endangered biota	1
Unique biota	1
Intolerant biota	2
Species/taxon richness	1
Aquatic Habitat Determinants	
Diversity of aquatic habitat types or features	1
Refuge value of habitat type	2
Sensitivity of habitat to flow changes	2
Sensitivity of flow related water quality changes	1.5
Migration route/corridor for instream and riparian biota	1.5
National parks, wilderness areas, Nature Reserves, Natural Heritage sites, Natural areas, PNEs	2
EIS CATEGORY	**Moderate**

RECOMMENDED ECOLOGICAL MANAGEMENT CATEGORY

In terms of the proposed water resource classes for Berg Water Management Area, the Target Ecological Category for the larger Klein Berg River in DWS quaternary catchment G10E is a C category within a Class II (moderate protection and utilisation) integrated unit of analysis area (Berg Tributaries). The recommended ecological condition of the Modderas River is that it is improved and maintained within the ecological category of C (moderately modified).

ENVIRONMENTAL WATER REQUIREMENTS

This section provides a consideration of the environmental water requirement (EWR) or in-stream flow requirements associated with the enlargement of the Modderas Dam, where the dam is to be filled from runoff from the catchment of the dam.

*The EWR for the Klein Berg River was extrapolated to the Modderas Dam. The Recommended Ecological Category (REC) for the watercourses concerned, based on the present ecological status and the ecological importance and sensitivity of these aquatic ecosystems, as well as the Berg River Classification, is a C category. The recommended EWR for the river is 20.3% of the nMAR. The monthly flow distribution curve (**Figure 10**) shows that under natural conditions (black line in the figure), there would be little to no flow in the tributary during the lowest-flowing months of November/December to March/April. It should be noted that the flow distribution is generated for the larger quaternary catchment that includes the Klein Berg River. One can therefore expect the flow in the tributary to be much lower. Water would typically be available for use from the watercourses in the area during May to September (difference between the black line and blue line).*

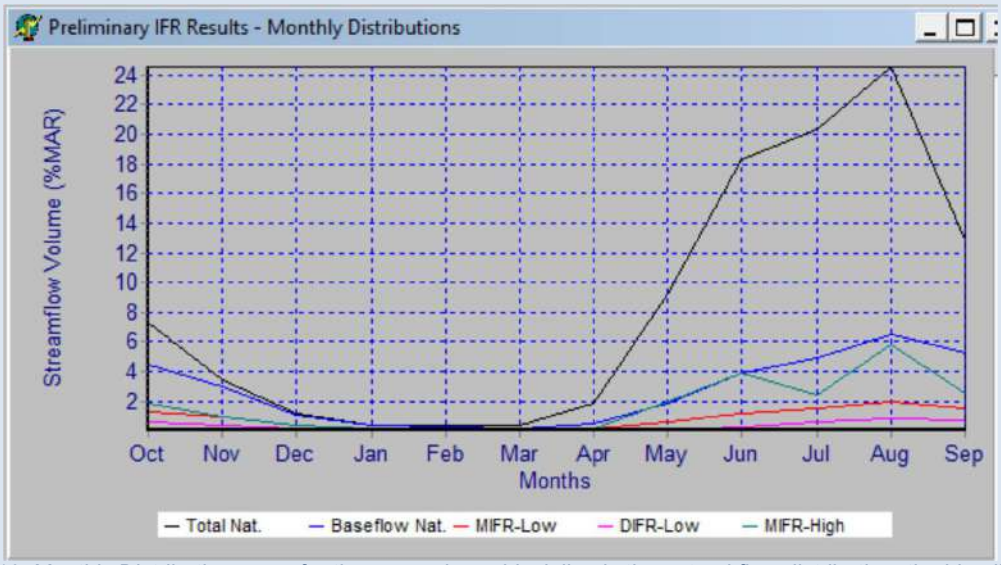


Figure 10. Monthly Distribution curve for the area, where: black line is the natural flow distribution; the blue line is the natural baseflow (mainly groundwater contribution); MIFR – Low is the Maintenance Low Flow Environmental requirement (red line on graph); DIFR – Low is the Drought Low Flow Environmental requirement (pink line on graph); and MIFR – High is the Maintenance High flow environmental requirement -larger floods and freshets– within year (green line on graph)

The following recommendations are made about the percentage of flow that should remain in the Tributary downstream of Modderas Dam:

*Table 3. Recommended **Average Monthly** Environmental Flow Downstream of the Modderas Dam.*

Month	Average monthly EWR		EWR as % of average natural monthly flow
	l/s	Mm³/month	%
Oct	17	0.044	25.6
Nov	9	0.023	28.8
Dec	3	0.008	30.8
Jan	1	0.003	30.0
Feb	1	0.002	22.2
Mar	1	0.002	28.6
Apr	2	0.004	8.9
May	18	0.047	21.4
June	35	0.092	21.1
July	23	0.059	12.2
Aug	54	0.139	23.8
Sept	24	0.061	20.1

*The EWR for the Modderas Tributary are based on simulated hydrology for 1920–2010 under natural conditions, expressed as average monthly flows. Confidence in this hydrology is low and would only improve with monitoring, while the EWR does not account for extreme wet/dry periods or downstream use. For this reason, EWR should not be stipulated as absolute flow volumes but rather as a **percentage of measured inflow** to the dam.*

The most practical way to meet the EWR, requiring minimal management, is through the smaller tributary that joins the Modderas just downstream of the dam. With a catchment of ~61 ha and runoff of ~150,000 m³ (≈40% of the MAR downstream), this stream drains a largely undeveloped catchment in the Grootwinterhoek Wilderness and Welbedacht stewardship area. Its near-natural runoff and healthy wetland habitat would provide for the EWR if left unimpeded.

It is therefore recommended that this tributary's flow not be diverted within the property so it can contribute to the Modderas Tributary's EWR. This aligns with the proposed decommissioning of Dam D2, which currently intercepts the stream.

3. Coastal Environment

3.1.	Was a specialist study conducted?	YES	***NO***
3.2.	Provide the name and/or company that conducted the specialist study.		
Not Applicable.			
3.3.	Explain how the relevant considerations of Section 63 of the ICMA were taken into account and explain how this influenced your proposed development.		
Not Applicable.			
3.4.	Explain how estuary management plans (if applicable) have influenced the proposed development.		
Not Applicable.			
3.5.	Explain how the modelled coastal risk zones, the coastal protection zone, littoral active zone and estuarine functional zones have influenced the proposed development.		
Not Applicable.			

4. Biodiversity

4.1.	Were specialist studies conducted?	***YES***	NO
4.2.	Provide the name and/or company that conducted the specialist studies.		
Toni Belcher – Aquatic Assessment			
4.3.	Explain which systematic conservation planning and other biodiversity informants, such as vegetation maps, NFEPA, NSBA, etc., have been used and how this has influenced your proposed development.		

The EAP consulted the following conservation planning and biodiversity informants to determine the sensitivity of the site, prior to the site verification visit:

- *Western Cape Biodiversity Spatial Plan (Cape Nature 2023)*
- *NFEPA data (2011)*
- *Cape Farm Mapper*
- *Google Earth Imagery*
- *National Screening Tool*

*The above data was confirmed on site on 29 January 2025. Refer to the Site Photographs included as **Appendix C** and the Site Sensitivity Verification Report included as **Appendix L**.*

A Freshwater Specialist was appointed to investigate the site to determine the sensitivity of the site in terms of aquatic sensitivity.

Spatial Data and Site Verification Investigated by Aquatic Specialist

Input into this report was informed by a combination of desktop assessments of existing freshwater ecosystem information for the study area and catchment as well as by a more detailed assessment of the freshwater features at the site. The site was visited for a single day on 15 April 2025 at the start of the rainy season. The timing of the assessment, although not ideal, was considered adequate for this assessment. Historical imagery, taken in the wet and dry periods, was also consulted to assist with the assessment.

During the field visit, characterisation and integrity assessments of the freshwater features were undertaken. The SANBI Biodiversity GIS, Cape FarmMapper and Freshwater Biodiversity Information System websites were also consulted to identify any constraints in terms of fine-scale biodiversity conservation mapping, freshwater features mapped in the Freshwater Ecosystem Priority Areas maps and freshwater biota present. This information/data was used to inform the water resource protection-related recommendations.

Consideration of the Reserve or environmental water requirement determination was undertaken at a rapid level (Rapid Reserve) utilising the guidelines for the South African methodologies for water resource protection as outlined in the documentation "Resource Directed Measures for Protection of Water Resources" (DWAF, 1999). Hydrology utilised for the assessment was obtained from Water Resources 2012.

4.4.	Explain how the objectives and management guidelines of the Biodiversity Spatial Plan have been used and how this has influenced your proposed development.

TERRESTRIAL BIODIVERSITY

The existing dam, crops and general agricultural disturbances transform the site. The expansion will occur to the west (loss of crops) and slightly to the north and east. The land to the north is riparian in nature, and the land to the east is fallow farmland. Minimal to no loss of natural vegetation will occur.

The site is mapped as Breede Shale Fynbos, which is considered an Endangered Vegetation Type. The enlarged dam will extend into existing crops to the west, a small section of riparian habitat to the north and a small portion of disturbed farmland to the east. ***Figure 11 and Figure 12*** *show the disturbed lands over time. The area to the east has been disturbed by past farming activities, and the land remains fallow. Little to no natural vegetation will be lost.*

AQUATIC BIODIVERSITY IMPORTANCE

The dam is an in-stream dam, and the watercourse has aquatic value/functioning. Three mapping initiatives are relevant to the proposed dam enlargement. The ***2023 Western Cape Biodiversity Spatial Plan*** *guides sustainable development by integrating biodiversity data for decision-making. It identifies* ***Critical Biodiversity Areas (CBAs)****,* ***Ecological Support Areas (ESAs)*** *and* ***Critical ESAs (CESAs)*** *as priority zones to be kept in a natural or near-natural state. The property lies downslope of the Winterhoek Mountain Catchment Area, a protected area, with the Welbedacht Nature Reserve about 300 m east. Downstream, the river is mapped as a terrestrial CBA (Figure 8).*

The second initiative, ***National Freshwater Ecosystem Priority Areas (NFEPA)****, identifies wetlands, rivers and estuaries by type but not condition. Some sub-catchments are mapped as River FEPAs, which must remain largely in their natural state. While the study area is not within a River FEPA sub-catchment, seep wetlands upstream of the dam are mapped as* ***natural FEPA wetlands****.*

The third initiative is the ***National Wetland Map version 5*** *which provides a national view of wetland extent and ecosystem types for estuarine and inland systems.*

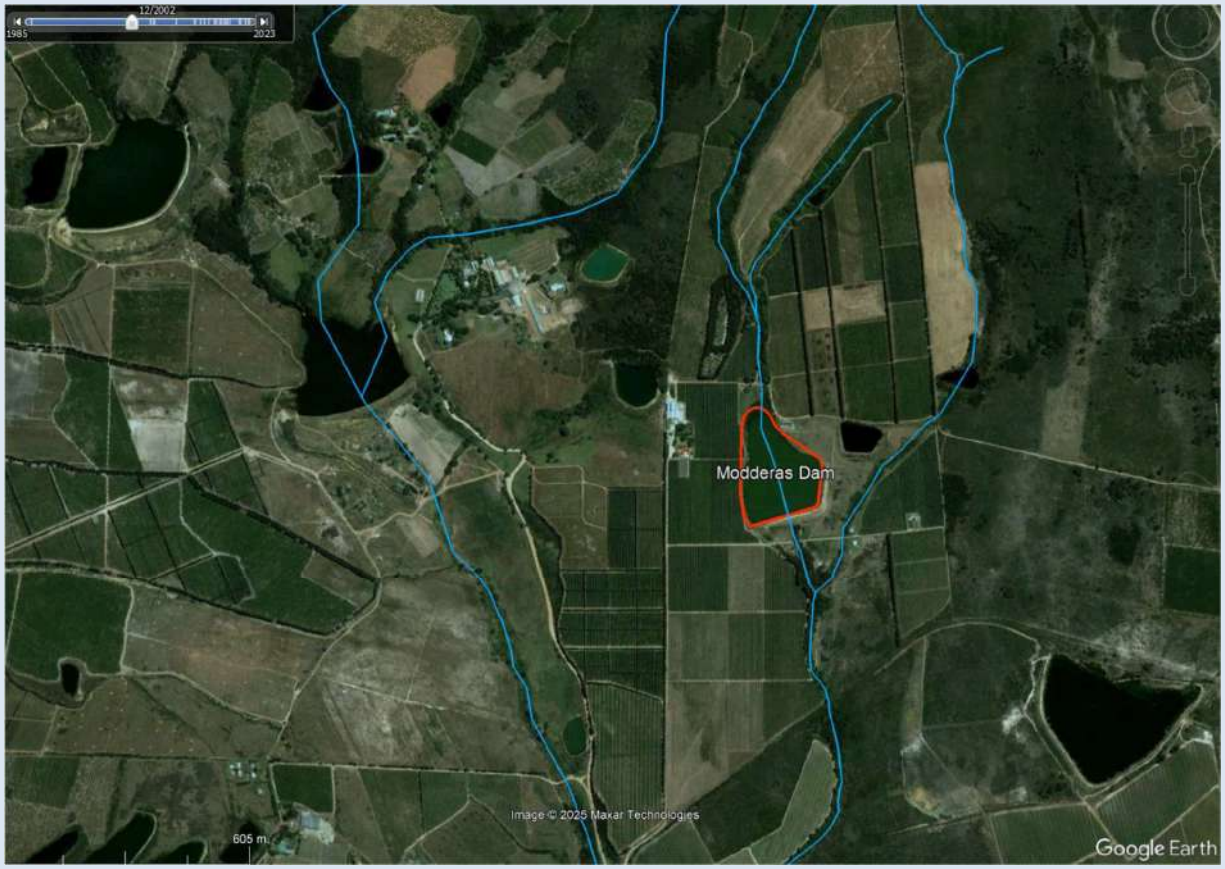


Figure 11: Google Earth Imagery dated 2002

Figure 11. Google Earth Imagery dated 2023.

*The Biodiversity Map is included as Error! Reference source not found. **D**.*

4.5.	Explain what impact the proposed development will have on the site-specific features and/or function of the Biodiversity Spatial Plan category and how this has influenced the proposed development.

Potential Freshwater Impacts for the Preferred Alternative

The impact assessment is for the preferred alternative (enlarging the existing 200,000 m^3 Modderas Dam to 310,000 m^3 and decommissioning of Dam D2 of 31,000 m^3. The potential aquatic ecosystem impacts associated with the proposed dam enlargement are:

- *Modified flow in the watercourse downstream of the dam.*
- *Disturbance and modification of the aquatic habitat within the dam basin of the enlarged dam.*
- *Short-term water quality impacts during the construction works.*
- *Indirect impact on aquatic biota.*

The Modderas Dam is an instream dam on the lower Modderas Tributary of the Klein Berg River. The tributary contributes less than 1% of the flow to the Klein Berg River. The enlargement dam would likely, however, be a greater than 1 MAR dam, which implies it will likely not spill every year, only in wetter-than-average years. Environmental flow mitigation will be necessary to maintain the downstream watercourse. There is a tributary that joins the Modderas River downstream of the dam, which contributes about 40% of the flow in the lower river. The dam to be decommissioned (Dam D2) receives water from a diversion from this tributary. There is thus potential to ensure the EWR contribution for the lower river is from the tributary. There is a small instream dam on this stream. Although it is on the adjacent property, this may reduce the ability to utilise this watercourse to mitigate the flow impact and implement the recommended environmental flow requirement.

Dam D2, proposed to be decommissioned, has long been in existence. The embankment of the dam and the adjacent area comprise largely natural vegetation cover. The area immediately to the east of the dam also includes a wider riparian and seep area associated with the smaller tributary of the Modderas River.

4.6.	If your proposed development is located in a protected area, explain how the proposed development is in line with the protected area management plan.

The site is not located within a Protected Area.

4.7.	Explain how the presence of fauna on and adjacent to the proposed development has influenced your proposed development.

The site and surrounds have been farmed and disturbed for many years but fauna could potentially move along the watercourse corridor to the dam. While there are planted crops between the dam and the adjacent private conservation area, fauna are able to move between the orchards to the dam site.

The following species were identified in the National Screening Tool Report:

Sensitivity	Feature(s)
High	Aves-Circus maurus
Medium	Invertebrate-Conocephalus peringueyi
Medium	Invertebrate-Brinckiella aptera

Circus maurus

The Black Harrier prefers coastal and mountain fynbos, highland grasslands, Karoo sub-desert scrub and open plains with low shrubs and croplands. Harriers breed close to coastal and upland marshes, damp sites, near vleis or streams with tall shrubs or reeds. It is unlikely that the Black Harrier is found on site but if it were to use the site, the proposed dam expansion will not affect this. No Black Harrier habitat will be lost and the expanded dam will not be an obstruction to the bird.

Conocephalus peringueyi

Peringuey's Meadow Katydid – This species of longhorn grasshopper is known only from the mountains of the southwestern Cape. Since this species in found on mountain tops, it is highly unlikely that it will be found on site; i.e. lower farm land that has been farmed and disturbed for years.

Brinckiella aptera

The Mute Winter Katydid - This species is endemic to the Fynbos and Succulent Karoo biomes. This habitat type is predominantly utilized for livestock grazing, cultivation with annual crops, and urban development which may be detrimental to the host plants of the species. B. aptera feeds on flowers and leaves of a very narrow range of host plants and occurs primarily on low, herbaceous shrubs.

Considering the nature and habitat condition of the proposed dam site, and the fact that this species only feeds on a very narrow range of host plants (herbaceous shrubs), it is highly unlikely that this species occurs on the transformed and actively farmed site.

The impact on terrestrial fauna is not anticipated to be significant as:

- *The enlarged dam will not impede the movement of fauna.*
- *No loss of faunal habitat is expected.*
- *EWR will be determined to ensure the ecological functioning of the watercourse is not affected.*
- *Animals currently using the dam site will continue to do so.*
- *The sensitive species identified in the Screening Tool are unlikely to be present on site.*

5. Geographical Aspects

Explain whether any geographical aspects will be affected and how this has influenced the proposed activity or development.
No other geographical aspects have been affected other than those described above.

6. Heritage Resources

6.1.	Was a specialist study conducted?	YES	**NO**
6.2.	Provide the name and/or company that conducted the specialist study.		
No specialist study was conducted.			
6.3.	Explain how areas that contain sensitive heritage resources have influenced the proposed development.		
There are no heritage or historical resources within the vicinity of the site. The application is for the expansion of an existing dam on an operational farm within the farming area north of Tulbagh. No heritage resources will be effected and the character of the site will not be altered in any way.			

7. Historical and Cultural Aspects

Explain whether there are any culturally or historically significant elements as defined in Section 2 of the NHRA that will be affected and how this has influenced the proposed development.
There are no heritage or historical resources within the vicinity of the site. *However, 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. Fossil finds procedure to be included in environmental authorization.*

8. Socio/Economic Aspects

8.1.	Describe the existing social and economic characteristics of the community in the vicinity of the proposed site.
The site is located within a predominantly agricultural area close to the small town of Tulbagh.	
8.2.	Explain the socio-economic value/contribution of the proposed development.
Increasing the existing dam's capacity provides a positive socio-economic contribution for the farming operation, as it will create the opportunity to store more water for summer irrigation. This, in turn, ensures more efficient and productive usage of water and the potential to irrigate fruit trees during drought periods. The agricultural potential of the farm is enhanced, benefiting the farmer, farm workers, and possibly the local community as well.	
8.3.	Explain what social initiatives will be implemented by the applicant to address the needs of the community and to uplift the area.
The Modderasrivier Trust contributes extensively towards job creation in the agricultural sector. The contribution in terms of job creation helps to ensure that the past racial and gender discrimination is addressed. A constant number of 40-50 farmworkers are employed in different job positions on the farm. Seasonal temporary workers are hired when required during harvesting times. A total of 10 males and 10 females are hired on an annual basis. *The Trust ensures that the farmworkers are exposed to several skills development opportunities. Some life skills training sessions are provided in-house regularly, which include First Aid, Health & Safety, Fire Fighting, Chemical Handling, and Personal Hygiene.* *Further job-oriented training is provided when required, such as Forklift Training, Tractor driver's licence, Irrigation scheduling and equipment, and pruning and maintenance of fruit trees.* *Housing, education, medical services, and transport are provided as required. These services, together with a fixed job opportunity, ensure that farmworkers get access to financial systems and improve their living standards.* *Accredited suppliers are used, including the Overberg and Agrimark in Tulbagh and Porterville.*	
8.4.	Explain whether the proposed development will impact on people's health and well-being (e.g. in terms of noise, odours, visual character and sense of place, etc) and how this has influenced the proposed development.
This application is for the expansion of an existing farm dam located in an intensively developed agricultural landscape. Impacts on human health and well-being are not anticipated.	

SECTION H: ALTERNATIVES, METHODOLOGY AND ASSESSMENT OF ALTERNATIVES

- **Details of the alternatives identified and considered**

1.1.	Property and site alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts.

Provide a description of the preferred property and site alternative.

The proposed enlarged dam is located on the fruit farm, Portion 1 of the Roode Zands Kloof Farm No. 66 in Tulbagh. The site development Plan is included in ***Appendix B1****.*

Provide a description of any other property and site alternatives investigated.

Two alternative sites for additional storage of water on the same farm were investigated. The first alternative (Alternative 1) was the repair and enlargement of Dam D2. Alternative 2 is located further north and upstream of Modderas Dam. It would be a new on-channel dam. Alternatives 1 and 2 are shown in

Figure 12 *and*

Figure 13 *respectively.*

Figure 12. Alternative dam site 1.

Figure 13. Alternative dam site 2

Provide a motivation for the preferred property and site alternative, including the outcome of the site selection matrix.

No sites were considered off the applicant's property, as the additional water storage is required to irrigate his farm. The first alternative (Alternative 1) would result in the loss of established orchards, which the applicant does not wish to lose. The small catchment area of this alternative would yield very little surface water runoff, and thus, filling the dam would be heavily reliant on pumping water into the dam. This alternative was considered to be impractical and uneconomical, and therefore it was discarded.

Alternative 2 is situated within one of the mapped Critical Biodiversity Areas (CBA),and NFEPA wetland areas and would entail the construction of a new instream dam within a sensitive wetland area. Alternative 2 would have a significantly larger impact on the existing stream, than the enlargement of the Modderas Dam; as such, it was ruled out.

Provide a full description of the process followed to reach the preferred alternative within the site.

An iterative process was followed to identify potential constraints and ensure the proposal is acceptable from both ecological, economic and dam design, as well as agricultural perspectives. A site selection matrix was not used.

Provide a detailed motivation if no property and site alternatives were considered.

Only alternative sites on the farm owned by the applicant were considered.

List the positive and negative impacts that the property and site alternatives will have on the environment.

The potential impacts on the aquatic ecosystem associated with the proposed enlargement of the Modderas Dam (preferred alternative) are listed below.

Negative:

- *Modified flow in the watercourse downstream of the dam.*
- *Disturbance and modification of the aquatic habitat within the dam basin of the enlarged dam.*
- *Short-term water quality impacts during the construction works.*
- *Indirect impact on aquatic biota.*

Positive:

- *Improved water security for the irrigation of fruit trees on the farm.*
- *Decommissioning of Dam 2, facilitating the implementation of the Environmental Flow Release (the existing dam has no release requirement), and rehabilitation of the associated aquatic habitats.*

Site Alternative 1 would result in the loss of orchards and has a small catchment area with limited runoff, making the dam dependent on pumped water and thus impractical and uneconomical. Alternative 2 lies within a mapped Critical Biodiversity Area and a channeled valley bottom wetland. A new dam at this site would have a greater impact on the stream than enlarging Modderas Dam.

1.2.	Activity alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts.

Provide a description of the preferred activity alternative.

No feasible or reasonable alternatives to this activity exist. It is an established farming operation, and the applicant wishes to expand an existing dam to increase the overall water storage capacity of the farming unit for irrigation use.
Provide a description of any other activity alternatives investigated.
No activity alternatives were investigated.
Provide a motivation for the preferred activity alternative.
Storing additional water will ensure water security for the existing farming operation, especially during droughts, and enable the applicant to irrigate his fruit trees, thereby increasing agricultural production.
Provide a detailed motivation if no activity alternatives exist.
No activity alternative exists as the applicant wishes to store more water to meet the existing irrigation requirements, thereby increasing agricultural production.
List the positive and negative impacts that the activity alternatives will have on the environment.
There are no activity alternatives.

1.3.	Design or layout alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts

Provide a description of the preferred design or layout alternative.
Modderas Dam Option 1 (Preferred alternative): *The Modderasrivier Trust wishes to enlarge the existing in-stream Modderas Dam (Dam D1). The dam is a Category II dam with a storage capacity of 200,000 m³ and a maximum wall height of 13.8 m. Dam 2 is an off-channel dam with a capacity of 31,000 m³.* *The planned storage capacity of the enlarged Modderas Dam will be 310,000 m³. An additional 110,000 m³ will therefore be stored. The Modderas Dam will be filled in terms of the Existing Lawful Use (ELU) for the farm, and a Water Use Licence Application (WULA) has been submitted to the Department of Water and Sanitation (DWS) for the additional storage of water.* *The project will involve the following components:* • *Enlargement of Modderas Dam from 200,000 m³ (13.8 m wall height) to a gross storage capacity of 310,000 m³ (15.1m wall height). The proposed total footprint area = 7.5 ha, which is only 2.2 ha of additional footprint area.* • *Extension of the existing Ø200 mm Class 6 uPVC outlet pipe on the upstream side.* • *Proposed by-pass spillway to discharge into the existing channel.* • *Decommissioning of Dam D2.* *The existing pump station will be used. All the materials required for the enlargement of Modderas Dam will be obtained for the basin. Additional rip-rap material would be sourced from the irrigation areas on the farm.* *Decommissioning of Dam D2 would involve leaving the dam as is and not storing any water in the dam, apart from natural runoff and rainwater. This will ensure that any surrounding vegetation is not disturbed.*
Provide a description of any other design or layout alternatives investigated.
Hagen Brink Consulting Engineers investigated four options for the design of the Modderas Dam for the required storage capacity of 310,000 m³. The water/wall ratio represents the volume of water gained per volume of fill necessary to construct the dam embankment. It is considered a good indication for selecting the most economical dam design alternative. See ***Figure 15****.* • *Dam Option 1 is an upstream embankment raising with the required storage capacity of 310,000 m³ and is the preferred dam option with the second-best water/wall ratio of 2.2.* • *Dam Option 2 is a downstream embankment raising with the required storage capacity of 310,000 m³ and is the most economical with a water/wall ratio of 4.5. However, this dam option would involve the relocation of the existing pump station, which is not considered feasible by the applicant.* • *Options 3 and 4 are less economical and considered more complex to construct compared to Option 1. These dam options were not considered further.* *Refer to the Dam Design Report attached as* ***Appendix G1 and Table 1 below for the dam statistics.***

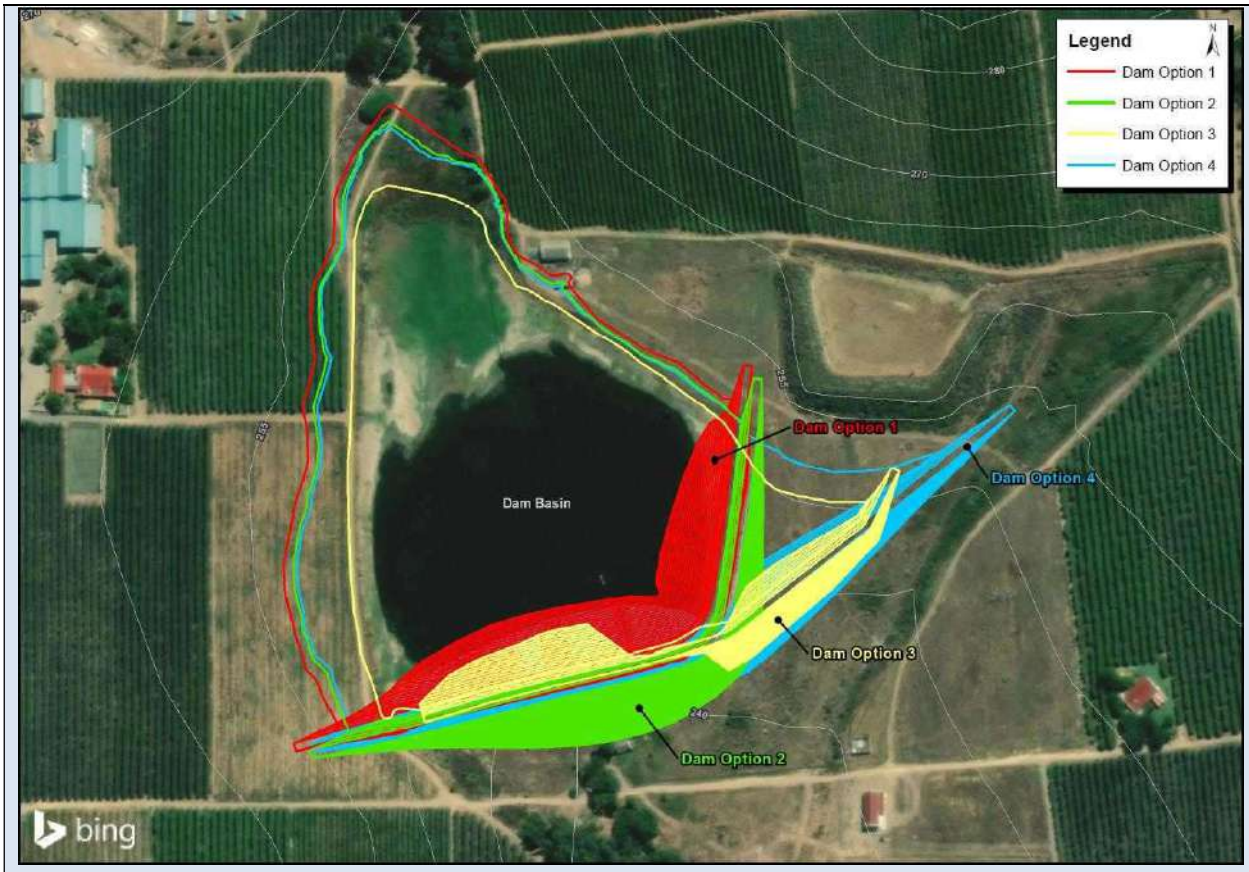


Figure 15: Dam options for the proposed Modderas Dam.

Provide a motivation for the preferred design or layout alternative.
Various alternatives were investigated, including the repair and enlargement of Dam D2, a new instream dam upstream on the Modderas River, and four options for raising the Modderas Dam wall, with Option 1, an upstream wall raising, being the preferred option from an economic perspective. *Option 1 would also have the least impact as the enlarged wall is located further from the more intact tributary of the Modderas River.*
Provide a detailed motivation if no design or layout alternatives exist.
N/A
List the positive and negative impacts that the design alternatives will have on the environment.
*The water/wall ratio measures storage gained per volume of embankment fill and indicates the most economical dam design. **Option 1**, an upstream raising with 310,000 m³ capacity, is the preferred choice despite a ratio of 2.2, as it avoids major complications. **Option 2**, a downstream raising with the same capacity, is most economical (ratio 4.5) but would require relocating the pump station, which the applicant deems unfeasible. Options 3 and 4 are less economical and more complex and were not pursued further.*

1.4.	Technology alternatives (e.g., to reduce resource demand and increase resource use efficiency) to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts.

Provide a description of the preferred technology alternative:
No technology alternatives were considered.
Provide a description of any other technology alternatives investigated.
No technology alternatives were considered.
Provide a motivation for the preferred technology alternative.
No technology alternatives were considered.
Provide a detailed motivation if no alternatives exist.

No technology alternatives were considered.	
List the positive and negative impacts that the technology alternatives will have on the environment.	
No technology alternatives were considered.	
1.5.	Operational alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts.
Provide a description of the preferred operational alternative.	
No operational alternatives were considered.	
Provide a description of any other operational alternatives investigated.	
No operational alternatives were considered.	
Provide a motivation for the preferred operational alternative.	
No operational alternatives were considered.	
Provide a detailed motivation if no alternatives exist.	
No operational alternatives were considered.	
List the positive and negative impacts that the operational alternatives will have on the environment.	
No operational alternatives were considered.	
1.6.	The option of not implementing the activity (the 'No-Go' Option).
Provide an explanation as to why the 'No-Go' Option is not preferred.	
The No-Go option would be the status quo. *The No-go Alternative would imply that no additional storage of water could be created within the property. This alternative would have the least potential impact, but would not provide the opportunities to:* • *Facilitate implementation of the Environmental Flow Release (the existing dam has no release requirement); and* • *Rehabilitate the associated aquatic habitats.* *No additional storage of water would be created within the property, and the farm would be dependent on the flow of the river throughout the year, as well as the reduced storage currently available due to the failed Dam 2. Irrigation of crops is primarily required in summer when flow is at its lowest in the river, placing farming operations at risk, especially during drought periods.* *No biophysical impacts associated with the proposed development would occur.* *The No-Go option would not achieve additional socio-economic benefits resulting from increased storage capacity and enhanced water security, as irrigation water would not be secured during times of drought or the drier summer months.* *This option is thus not preferred from a socio-economic or an aquatic perspective.*	
1.7.	Provide an explanation as to whether any other alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts, or detailed motivation if no reasonable or feasible alternatives exist.
No further alternatives were considered.	
1.8.	Provide a concluding statement indicating the preferred alternatives, including the preferred location of the activity.
In terms of the various dam alternatives considered, the two dam locations would have a more significant impact than the proposed dam enlargement, as they would be located in more sensitive wetland areas. Of the various dam alternatives, Option 1 (the preferred option) would also have the least impact as the enlarged wall is located further from the more intact tributary of the Modderas River. *The No-go Alternative would imply that no additional storage of water could be created within the property. This alternative would have the least potential impact, but would not provide the opportunities to:* • *Facilitate implementation of the Environmental Flow Release (the existing dam has no release requirement); and* • *Rehabilitate the associated aquatic habitats.*	

Table 1: Dam Statistics

HAGENBRINK CONSULTING ENGINEERS PASSION | EXCELLENCE | INNOVATION	Raising of Modderas Dam				
	Existing	Option 1: Upstream raising + upstream core trench	Option 2: Downstream raising with no core trench	Option 3	Option 4
Proposed NOC (m)	253.5	255.6	255.3	253.5	255.2
Proposed FSL (m)	**252.2**	**254.1**	**253.8**	**252.2**	**253.7**
Freeboard	1.3	1.5	1.5	1.3	1.5
Maximum wall height (m)	13.00	15.1	15.3	13.0	14.9
Proposed Wall crest width (m)	±6	4.0	4.0	4.0	4.0
DS Dam wall Slope	1V:2H	1V:2H	1V:2H	1V:2H	1V:2H
US Dam wall Slope	1V:2.1H To 1V:4	1V:3H	1V:2.1H To 1V:4	1V:2.1H To 1V:4	1V:3H
New Wall Fill (m^3)		25 000	21 500	10 000	29 000
Wall length (m)	303	387	383	309	442
Crest length/height	23	26	25	24	30
Capacity without cut from basin (m^3)	212 421	286 515	289 288	214 306	285 256
Water surface area at FSL (m^2)	43 879	55 452	55 123	47 804	58 261
Water surface area at FSL (Ha)	4.4	5.5	5.5	4.8	5.8
Average excavation depth to FSL (m)	**0.0**	**0.5**	**0.4**	**0.2**	**0.5**
Total Capacity (m^3)	**212 400**	**310 000**	**310 000**	**224 300**	**310 000**
Increased Capacity (m^3)		**97 600**	**97 600**	**11 900**	**97 600**
Estimated average core trench width (m)	4.2	5.0	4.4	4.8	5.0
Estimated average core trench depth (m)		5.0	0.0	5.0	5.0
Estimated core trench volume (m^3)	0	19 400	0	15 100	22 000
		44%	0%	60%	43%
Total earthfill (m^3)	**0**	**44 400**	**21 500**	**25 100**	**51 000**
Water/Wall Ratio		**2.20**	**4.54**	**0.47**	**1.91**
Minimum basin level (m)	243.00	243.00	243.00	243.00	243.00
Downstream toe level (m)	240.50	240.50	240.00	240.50	240.30
Maximum Storage depth (m)	9.2	11.1	10.8	9.2	10.7

- **"No-Go" areas**

Explain what "no-go" area(s) have been identified during the identification of the alternatives and provide the coordinates of the "no-go" area(s).

*The area to the east of Dam 2 must be regarded as a no-go area. See **Figure 16**.*

A	*33°12'30.10"S*	*19° 7'36.74"E*	*C*	*33°12'34.03"S*	*19° 7'31.86"E*
B	*33°12'33.52"S*	*19° 7'32.34"E*	*D*	*33°12'38.78"S*	*19° 7'28.49"E*

Figure 16: No-Go Area

- **Methodology to determine the significance ratings of the potential environmental impacts and risks associated with the alternatives.**

Describe the methodology to be used in determining and ranking the nature, significance, consequences, extent, duration of the potential environmental impacts and risks associated with the proposed activity or development and alternatives, the degree to which the impact or risk can be reversed and the degree to which the impact and risk may cause irreplaceable loss of resources.

These criteria are drawn from the EIA Regulations published by the Department of Environmental Affairs and Tourism (April 1998) in terms of the Environmental Conservation Act, 1989 (Act No. 73 of 1989) and the latest BAR template provided by the DEA&DP. These criteria include:

Nature of the impact

This is an appraisal of the type of effect (positive or negative) the construction, operation and maintenance of a development would have on the affected environment. This description should include what is to be affected.

Extent of the impact

Extent defines the physical extent or spatial scale of the impact. The impact could be:

***Site-specific**: Limited to the site.*

***Local:** Limited to the site and the immediate surrounding area (1-10km)*

Regional: *Covers an area that includes an entire geographic region or extends beyond one region to another.*

National: *Across national boundaries and may have national implications.*

Duration of the impact

The specialist should indicate whether the lifespan of the impact would be:

Short term*: 0-5 years.*

Medium term*: 5-15 years.*

Long term*: Beyond the operational phase, but not permanently.*

Permanent: *Where mitigation either by natural processes or by human intervention will not occur in such a way or in such time span that the impact can be considered transient or temporary.*

Discontinuous or intermittent*: Where the impact may only occur during specific climatic conditions or during a particular season of the year.*

Consequence of impact

Indicate what will happen if the impact occurs.

Probability of occurrence

Probability describes the likelihood of the impact occurring. The likelihood can be described as:

Improbable/unlikely: *Low likelihood of the impact occurring.*

Probable: *There is a distinct possibility that the impact will occur.*

Highly probable: *Most likely that the impact will occur.*

Definite: *Impact will occur regardless of any prevention measures.*

Irreplaceable loss of resources

Specialists should state whether or not the impacts may be irreversible or may result in an irreplaceable loss of resources. It can be ***no loss, marginal loss, significant loss*** *or* ***complete loss*** *of resources.*

Reversibility

This refers to the degree to which an impact can be reversed.

Fully reversible*: Where the impact can be reversed entirely.*

Partly reversible*: Where the impact can be partially reversed.*

Irreversible*: Where the impact is permanent.*

Indirect impacts

Indirect impacts are secondary impacts and usually occur at a different place or time. Specialists will need to elaborate on any indirect or secondary impacts of proposed activities. If there are no indirect impacts, the specialist will need to explain briefly.

Cumulative impact

An effect which in itself may not be significant but may become significant if added to other existing or potential impacts that may result from activities associated with the proposed development or similar developments in the surrounding area. Cumulative impacts must be assessed prior to and post mitigation. Such impacts will be either positive or negative, and will be graded as being of negligible, ***low, medium*** *or* ***high impact****.*

Degree to which the impact can be avoided

This indicates the degree to which an impact can be avoided. Impacts can either be ***fully avoided*** *(impact is completely avoidable),* ***partly avoided*** *(impact is avoidable with moderate mitigation and/or management), or the impact is* ***unavoidable*** *(the impact cannot be avoided even with significant mitigation measures and/or management).*

Degree to which impact can be managed

This indicates the degree to which an impact can be managed. Impacts can either be ***fully managed*** *(impact is completely manageable),* ***partly managed*** *(impact is manageable with moderate mitigation and/or management), or the impact is* ***unmanageable*** *(the impact cannot be managed even with significant mitigation measures).*

Degree to which an impact can be mitigated

This indicates the degree to which an impact can be reduced. The degree of mitigation can either be ***high*** *(the impact can be fully mitigated),* ***moderate*** *(the impact can be partly mitigated) or* ***not mitigated at all****.*

Significance

Based on a synthesis of the information contained in the above-described procedure, the significance of the potential impacts can be assessed (prior to and post mitigation) in terms of the following significance criteria:

No impact/Negligible

***Low negative**:*	*Where it would have minor negative effects and would require little or no mitigation.*
***Low positive**:*	*The impact will have minor positive effects.*
***Medium negative**:*	*The impact will have moderate negative effects and will require moderate mitigation.*
***Medium positive**:*	*The impact will have moderate positive effects.*
***High negative**:*	*The impact will have significant effects and will require significant mitigation measures to achieve an accepted level of impact.*
***High positive**:*	*The impact will have significant positive effects.*
***Very high negative**:*	*The impact will have highly significant effects and is unlikely to be mitigated adequately.*
***Very high positive**:*	*The impact will have highly significant positive effects.*

Residual impacts

Residual impacts are those impacts that remain following the implementation of mitigation measures. Residual impacts must be identified and discussed. If there are no residual impacts, the specialist will need to explain that the activity will have no residual impacts briefly.

- **Assessment of each impact and risk identified for each alternative**

Note: The following table serves as a guide for summarising each alternative. The table should be repeated for each alternative to ensure a comparative assessment. The EAP may decide to include this section as Appendix J to this BAR.

The proposed enlargement of the Modderas Dam from 200,000 m³ to 310,000 m³ represents a feasible, practical, and least environmentally damaging option for securing long-term water supply for the farming operation. An analysis of alternatives showed that the repair/enlargement of Dam D2 would result in the loss of established orchards and depend on pumped water, rendering it uneconomical and impractical. A new on-channel dam (Alternative 2) would fall within a mapped Critical Biodiversity Area and cause greater ecological disturbance, while also likely to be opposed by regulatory authorities. Of the engineering design options, Option 1 (upstream embankment raising) was selected as the preferred option because it balances cost-effectiveness with minimising impacts, while avoiding relocation of infrastructure. As such, these alternatives have been scoped out for further assessment, and this section considers the impacts of Alternative 1 and the no-go option.

	Alternative 1 (Preferred Option):	
Alternatives:	**Enlarged Modderas Dam**	**Decommissioning of Dam 2**
PLANNING, DESIGN AND DEVELOPMENT PHASE		
Potential impact and risk:	**AQUATIC IMPACTS**	
Impact:	*Modification of aquatic habitat at the dam site; water quality impacts, as well as potential for some flow modification*	
Nature of impact:	*Negative*	*Negative*
Extent and duration of impact:	*Local and long term*	*Site and short term*
Consequence of impact or risk:	*Slightly modified aquatic habitat at and downstream of the dam*	*Disturbance of habitats at the dam*
Probability of occurrence:	*Highly probable*	*Probable*
The degree to which the impact may cause irreplaceable loss of resources:	*Medium*	*None*

Degree to which the impact can be reversed:	*Partially reversible*	*Reversible*
Indirect impacts:	*Water quality*	*Water Quality*
Cumulative impact prior to mitigation:	*Medium negative*	*Low negative*
Significance rating of impact prior to mitigation	*Medium negative*	*Low negative*
Degree to which the impact can be avoided:	*Medium to low*	*High*
Degree to which the impact can be managed:	*High to medium*	*High*
Degree to which the impact can be mitigated:	*High*	*High*
Proposed mitigation:	• *With regards to the implementation of the EWR in the lower Modderas Tributary, it is recommended that the smaller tributary that drains past Dam D2 be utilised to meet the environmental flow requirement..* • *The construction works at the dam should take place during the driest months of the year to prevent any flow and water quality (sedimentation) impacts and should be carried out in conjunction with an approved EMP that addresses aspects such as prevention and containment of any contaminated runoff and chemical spills from the construction site; provision of ablution facilities at the construction site that are at least 30m from the watercourse, and mitigation of excessive sedimentation arising from the works.* • *Disturbance of the natural vegetation cover upstream of the dam and immediately downstream of the dam within the watercourse should be avoided. Any disturbed areas that are located immediately outside of the dam basin should be rehabilitated by reshaping the area to resemble that of the surrounding natural landscape and where necessary, these areas should be planted with suitable local indigenous vegetation. 4* • *The disturbed areas at the dam should also be monitored for the growth of invasive alien vegetation and any recruitment of alien plants should be removed. Longer-term maintenance activities associated with the operation of the dam should follow an adopted MMP for the property.*	• *In the decommissioning of Dam D2, the dam should simply be left as is but no longer store water (i.e divert water to it and abstract from it). Only the natural rainfall and runoff into the dam should be retained in the dam and allowed to seep out. There is quite a bit of natural vegetation in and around the dam that it would be best to not disturb.* • *Activities should be carried out in conjunction with an approved EMP that addresses aspects such as prevention and containment of any contaminated runoff and chemical spills from the construction site; provision of ablution facilities at the construction site that are at least 30 m from the watercourse, and mitigation of excessive sedimentation arising from the works.* • *Any disturbed areas should be rehabilitated by reshaping the area to resemble that of the surrounding natural landscape, and where necessary, these areas should be planted with suitable local indigenous vegetation.*
Residual impacts:	*Localised modification of aquatic habitat*	

Cumulative impact post mitigation:	*Medium to low negative*	*Low negative*
Significance rating of impact after mitigation	*Medium to low negative*	*Low negative*
Potential impact and risk:	***DUST***	
Impact:	*Construction of the dam and the temporary increase in construction-related traffic could cause a potential temporary dust nuisance to those living nearby.*	*Decommissioning of the dam and the temporary increase in construction-related traffic could cause a potential temporary dust nuisance to those living nearby.*
Nature of impact:	*Negative*	*Negative*
Extent and duration of impact:	*Local and Short-term (construction phase, usually about 4 months)*	*Local and Short-term (decommissioning phase, generally less than 4 months)*
Consequence of impact or risk:	*Potential health hazard and inconvenience to nearby locals (particularly the adjacent farm workers' houses)*	*Potential health hazard and inconvenience to nearby locals (particularly the adjacent farm workers' houses)*
Probability of occurrence:	*Highly probable*	*Highly probable*
The degree to which the impact may cause irreplaceable loss of resources:	*No loss of resources*	*No loss of resources*
Degree to which the impact can be reversed:	*Partially to fully reversible through mitigation (if it were to occur)*	*Partially to fully reversible through mitigation (if it were to occur)*
Indirect impacts:	*None are evident should mitigation measures be implemented*	*None are evident should mitigation measures be implemented*
Cumulative impact prior to mitigation:	*Medium negative*	*Medium negative*
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	*Medium negative*	*Medium negative*
Degree to which the impact can be avoided:	*Moderate*	*Moderate*
Degree to which the impact can be managed:	*Moderate*	*Moderate*
Degree to which the impact can be mitigated:	*The impact can be partly mitigated; dust creation is inevitable on a construction site.*	*The impact can be partly mitigated; dust creation is inevitable on a construction site.*
Proposed mitigation:	• *The Applicant/contractor should ensure that the generation of dust is minimised and should implement dust control measures to maintain a safe working environment, minimise nuisance for residents in the vicinity of the site and avoid damage to the surrounding cultivated areas (orchards, etc.);* • *Construction should preferably not take place during windy conditions; and*	• *The Applicant/contractor should ensure that the generation of dust is minimised and should implement dust control measures to maintain a safe working environment, minimise nuisance for residents in the vicinity of the site and avoid damage to the surrounding cultivated areas (orchards, etc.);* • *Construction should preferably not take place during windy conditions; and* • *Construction vehicles shall comply with speed limits, and*

	• *Construction vehicles shall comply with speed limits, and haul distances should be minimised.* • *Water spraying by means of a water bowser, but taking into consideration any water restrictions, drought conditions, etc.*	*haul distances should be minimised.* • *Water spraying by means of a water bowser, but taking into consideration any water restrictions, drought conditions, etc.*
Residual impacts:	*The potential impact would only be temporary until the dam is filled*	*The potential impact would only be temporary until the dam is filled*
Cumulative impact post mitigation:	*Low negative*	*Low negative*
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	*Low negative*	*Low negative*
Potential impact and risk:	***SOCIAL IMPACTS***	
Impact:	*Creation of employment during the construction phase*	*Creation of employment during decommissioning*
Nature of impact:	*Positive*	*Positive*
Extent and duration of impact:	*Local and short-term*	*Local and short-term*
Consequence of impact or risk:	*Temporary employment opportunities for local contractors will be created*	*Temporary employment opportunities for local contractors will be created*
Probability of occurrence:	*Definite*	*Definite*
The degree to which the impact may cause irreplaceable loss of resources:	*No need to reverse*	*No need to reverse*
Degree to which the impact can be reversed:	*No loss*	*No loss*
Indirect impacts:	*Transfer of skills*	*Transfer of skills*
Cumulative impact prior to mitigation:	*Medium positive*	*Medium positive*
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	*Medium positive*	*Medium positive*
Degree to which the impact can be avoided:	*No need to avoid*	*No need to avoid*
Degree to which the impact can be managed:	*Impact can be fully managed (enhanced) by employing locally based contractors, and if farm workers are employed.*	*Impact can be fully managed (enhanced) by employing locally based contractors, and if farm workers are employed.*
Degree to which the impact can be mitigated:	*Low*	*Low*
Proposed mitigation:	*Local contractors should be used where possible*	*Local contractors should be used where possible*
Residual impacts:	*None*	*None*
Cumulative impact post mitigation:	*Medium positive*	*Medium positive*
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	*Medium positive*	*Medium positive*

OPERATIONAL PHASE			
	Enlarged Modderas Dam	**Decommissioning of Dam 2**	**No-Go Alternative**
Potential impact and risk:	**Aquatic impacts**		
Impact:	*Ongoing disturbance of aquatic habitat for operation/maintenance activities; flow impact, increased potential for alien vegetation growth and erosion*	*Possible alien plant invasion in the disturbed dam basin*	*Ongoing disturbance of aquatic habitat for operation/maintenance activities*
Nature of impact:	*Negative*	*Negative*	*Negative*
Extent and duration of impact:	*Local and long-term*	*Site and short- term*	*Site and short- term*
Consequence of impact or risk:	*Slightly modified aquatic habitat at and downstream of the enlarged dam*	*None*	*Some habitat modification and disturbance at original dam*
Probability of occurrence:	*Probable*	*Unlikely*	*Probable*
The degree to which the impact may cause irreplaceable loss of resources:	*Marginal loss*	*No loss*	*Marginal loss*
Degree to which the impact can be reversed:	*Partially reversible*	*Reversible*	*Partially reversible*
Indirect impacts:	*Alien vegetation growth*	*Alien vegetation growth*	*Alien vegetation growth*
Cumulative impact prior to mitigation:	*Medium to low*	*Low*	*Medium to low*
Significance rating of impact prior to mitigation	*Medium to low*	*Low*	*Medium to low*
Degree to which the impact can be avoided:	*Medium to high*	*High*	*Medium*
Degree to which the impact can be managed:	*High*	*High*	*High*
Degree to which the impact can be mitigated:	*High*	*High*	*Medium*
Proposed mitigation:	• *There should also be ongoing removal and control of invasive alien vegetation along*	• *There should also be ongoing removal and control of invasive alien vegetation*	-

	the river corridors and in the wetland areas within the property, and in particular within the Modderas Tributary that is proposed to provide for the EWR downstream of Modderas Dam. • *Removal of invasive vegetation and revegetation of the aquatic habitats could be informed by an adopted MMP for the property.* • *The disturbed areas at the dam should also be monitored for the growth of invasive alien vegetation, and any recruitment of alien plants should be removed. Longer-term maintenance activities associated with the operation of the dam should follow an adopted MMP for the property.* • *No stocking of the dam with alien fish should be allowed. Any stocking of the dam would need to get prior approval from CapeNature.*	*along the river corridors and in the wetland areas within the property, and in particular within the Modderas Tributary that is proposed to provide for the EWR downstream of Modderas Dam.* • *Removal of invasive vegetation and revegetation of the aquatic habitats could be informed by an adopted MMP for the property.* • *The disturbed areas at the dam should also be monitored for the growth of invasive alien vegetation, and any recruitment of alien plants should be removed. Longer-term maintenance activities associated with the operation of the dam should follow an adopted MMP for the property.*	
Residual impacts:	*Modification of the aquatic habitat related to the operation of the dam*	*Modification of aquatic habitat associated with the decommissioning of the dam*	*Modification of aquatic habitat related to operation of dam*
Cumulative impact post mitigation:	*Low negative*	*Low negative*	*Low negative*
Significance rating of impact after mitigation	*Low negative*	*Very Low negative*	*Low negative*
Potential impact and risk:	**SOCIAL**		
	Creation of employment	*Creation of employment*	*No additional employment opportunities.*
Nature of impact:	*Positive*	*Positive*	
Extent and duration of impact:	*Local and long-term*	*Local and long-term*	
Consequence of impact or risk:	*New jobs will be created, and existing jobs will be secured.*	*New jobs will be created, and existing jobs will be secured.*	

Probability of occurrence:	*Definite*	*Definite*	
The degree to which the impact may cause irreplaceable loss of resources:	*No need to reverse*	*No need to reverse*	
Degree to which the impact can be reversed:	*No loss*	*No loss*	
Indirect impacts:	*None*	*None*	
Cumulative impact prior to mitigation:	*Medium positive*	*Medium positive*	
Significance rating of impact prior to mitigation	*Medium positive*	*Medium positive*	
Degree to which the impact can be avoided:	*No need to avoid*	*No need to avoid*	
Degree to which the impact can be managed:	*Impact can be fully managed (enhanced) by employing individuals from the surrounding community.*	*Impact can be fully managed (enhanced) by employing individuals from the surrounding community.*	
Degree to which the impact can be mitigated:	*Low*	*Low*	
Proposed mitigation:	*Local community members should be employed where possible.*	*Local community members should be employed where possible.*	
Residual impacts:	*None*	*None*	
Cumulative impact post mitigation:	*Medium positive*	*Medium positive*	
Significance rating of impact after mitigation	*Medium positive*	*Medium positive*	
DECOMMISSIONING AND CLOSURE PHASE			
The proposed development will not be decommissioned. *Decommissioning of Dam D2 would involve leaving the dam as is and not storing any water in the dam, apart from natural runoff and rainwater. This will ensure that any surrounding vegetation is not disturbed.*			

SECTION I: FINDINGS, IMPACT MANAGEMENT AND MITIGATION MEASURES

1.	Provide a summary of the findings and impact management measures identified by all Specialists and an indication of how these findings and recommendations have influenced the proposed development.

*The aquatic assessment (**Appendix G2**) found the Modderas River to be moderately to largely modified, with moderate ecological importance and sensitivity. Enlarging the Modderas Dam (200,000 m³ to 310,000 m³) and decommissioning Dam D2 (31,000 m³) could have some negative impacts. The potential aquatic ecosystem impacts associated with the proposed dam enlargement are:*

- *Modified flow in the watercourse downstream of the dam.*
- *Disturbance and modification of the aquatic habitat within the dam basin of the enlarged dam.*
- *Short-term water quality impacts during the construction works.*
- *Indirect impacts on aquatic biota.*

As a >1 MAR dam, it may not spill annually, requiring environmental flow mitigation. A tributary that joins the Modderas River downstream of the dam contributes about 40% of the flow in the lower river, which will assist in meeting the environmental water requirement (EWR). The dam to be decommissioned (Dam D2) receives water from a diversion from this tributary. There is thus potential to ensure the EWR contribution for the lower river is from the tributary. However, there is a small in-stream dam on this stream on the adjacent property that may reduce the ability to utilise this watercourse to mitigate the flow impact and implement the recommended environmental flow requirement.

*Significance without mitigation: **Medium to low negative** impact because the existing dam already impacts the flow in the watercourse. Raising the dam wall would, however, increase the periods of no flow in the downstream watercourse.*

Mitigation includes the following measures:

- *Securing EWR from the smaller tributary.*
- *Alien vegetation removal and rehabilitation guided by a Maintenance Management Plan (MMP).*
- *Dry-season construction complying with the EMPr with sediment, spill, and ablution controls.*
- *Avoiding unnecessary disturbance to natural vegetation.*
- *Disturbed areas should be reshaped, revegetated with indigenous species, and monitored for invasive plants.*
- *Stocking of alien fish should not occur without CapeNature approval.*

Dam D2 has been in existence for a long time. The embankment of the dam and the adjacent area comprise largely natural vegetation cover. The area immediately to the east of the dam also includes a wider riparian and seep area associated with the smaller tributary of the Modderas River. Decommissioning of Dam D2 should avoid disturbance to natural vegetation and riparian/seep areas, with the basin filled using seed free of alien vegetation.

*Significance after mitigation: **Low negative** with the implementation of environmental water requirements in the Mooderas River, as well as the recommended rehabilitation of the aquatic habitats on the property.*

***No significant loss of natural vegetation** is expected since the enlarged dam will extend into existing crops to the west, a small section of riparian habitat to the north and a small portion of disturbed farmland to the east. The area to the east has been disturbed by past farming activities, and the land remains fallow.*

*The impact on **terrestrial fauna is not anticipated to be significant** as:*

- *The enlarged dam will not impede the movement of fauna.*
- *No loss of faunal habitat is expected.*
- *EWR will be determined to ensure the ecological functioning of the watercourse is not affected.*
- *Animals currently using the dam site will continue to do so.*
- *The sensitive species identified in the Screening Tool are unlikely to be present on site.*

2.	List the impact management measures that were identified by all specialists that will be included in the EMPr.

The following mitigation measures are recommended:

- *The area immediately to the east of Dam D2 which is to be decommissioned comprises a wider riparian and seep area associated with the smaller tributary of the Modderas River. With decommissioning of the dam, it is important the disturbance of these areas be avoided and that the dam basin simply be filled with soil that is free of alien vegetation seed.*
- *With regards to the implementation of the EWR in the lower Modderas Tributary, it is recommended that the smaller tributary that drains past Dam D2 be utilised to meet the environmental flow requirement. In the decommissioning of Dam D2, the dam should simply be left as is but no longer store water (i.e divert water to it and abstract from it).*

Only the natural rainfall and runoff into the dam should be retained in the dam and allowed to seep out. There is quite a bit of natural vegetation in and around the dam that it would be best to not disturb.

- *A programme should be put in place for the ongoing removal and control of invasive alien vegetation along the river corridors and in the wetland areas within the property, and in particular within the Modderas Tributary that is proposed to provide for the EWR downstream of Modderas Dam. Removal of invasive vegetation and revegetation of the aquatic habitats could be informed by an adopted Maintenance Management Plan (MMP) for the property (Annexure 6 of the EMPr attached as **Appendix H**).*
- *The construction works at the dam should take place during the driest months of the year to prevent any flow and water quality (sedimentation) impacts and should be carried out in conjunction with an approved EMP that addresses aspects such as prevention and containment of any contaminated runoff and chemical spills from the construction site; provision of ablution facilities at the construction site that are at least 30m from the watercourse, and mitigation of excessive sedimentation arising from the works.*
- *Disturbance of the natural vegetation cover upstream of the dam and immediately downstream of the dam within the watercourse should be avoided. Any disturbed areas that are located immediately outside of the dam basin should be rehabilitated by reshaping the area to resemble that of the surrounding natural landscape and where necessary, these areas should be planted with suitable local indigenous vegetation.*
- *The disturbed areas at the dam should also be monitored for the growth of invasive alien vegetation and any recruitment of alien plants should be removed. Longer-term maintenance activities associated with the operation of the dam should follow an adopted MMP (Annexure 6 of the EMPr attached as **Appendix H**) for the property.*
- *No stocking of the dam with alien fish should be allowed. Any stocking of the dam would need to get prior approval from CapeNature.*
- *Indigenous vegetation observed along the watercourse that is suitable for revegetation of cleared areas comprises Psoralea pinnata, Searsia angustifolia, Morella serrata, Olea europaea subsp. africana, Podocarpus elongatus, Melianthus major, Pteridium aquilinum, Salvia chamelaeagnea, Elegia capensis, Zantedeschia aethiopica, Carpha glomerata, Juncus capensis, Ficinia nodosa, Cyprus textilis and Isolepis prolifera.*

3.	List the specialist investigations and the impact management measures that will **not** be implemented and provide an explanation as to why these measures will not be implemented.

All the proposed mitigation measures will be implemented.

4.	Explain how the proposed development will impact the surrounding communities.

No negative socio-economic impacts are expected should this proposal be approved. The advantages of the proposal include:

- *Those already employed on the farm will have increased job security,*
- *Additional employment opportunities may be created for the local community; and*
- *Economic growth of the region may be enhanced.*

The direct and indirect positive impacts resulting from the proposed activity can be safeguarded through the implementation of best farming practices.

5.	Explain how the risk of climate change may influence the proposed activity or development, and how the potential impacts of climate change have been considered and addressed.

Should climate change affect long-term rainfall of the area, the flows of the Modderas River may be affected and water availability for storage compromised. TBy storing more water in winter for use in summer, the demand on the river flow is reduced during the drier months when flows are less and irrigation requirements are higher.

6.	Explain whether there are any conflicting recommendations between the specialists. If so, explain how these have been addressed and resolved.

There are no conflicting recommendations.

7.	Explain how the findings and recommendations of the different specialist studies have been integrated to inform the most appropriate mitigation measures that should be implemented to manage the potential impacts of the proposed activity or development.

The findings of the specialist study have been considered and mapped. All relevant recommendations (recommendations relating to impacts that have subsequently been avoided/removed are excluded) made by the specialist have been integrated into the Planning, Design and Development Phase, and the Operational Phase, as mitigation measures to reduce all identified potential impacts.

Should the application be approved, these measures must be conditions of approval.

8.	Explain how the mitigation hierarchy has been applied to arrive at the best practicable environmental option.

The mitigation hierarchy was considered throughout this application to achieve the best practicable environmental option. The tiers of the mitigation hierarchy are: avoid or prevent, minimise, rehabilitate and offset. This hierarchy was applied as follows:

Initially, consideration was given to several options to increase storage capacity on the farm and to access the full EWU. Two alternative sites were considered for a farm dam, which would have more significant negative ecological impacts as they are located in more sensitive wetland areas. Of the various dam alternatives, Option 1 (the preferred option) would also have the least impact as the enlarged wall is located further from the more intact tributary of the Modderas River and is most cost-effective. This option includes the decommissioning of Dam 2, which has a positive impact in terms of enhanced EWR flows downstream.

The No-go Alternative would result in no additional storage of water on the property. This alternative would have the least potential impact. Still, it would not provide the opportunities to facilitate the implementation of the EWR (the existing dam has no release requirement) and rehabilitate the associated aquatic habitats.

An Aquatic Specialist was appointed to assess the alternatives. This resulted in the identification of various mitigation measures to ensure that any negative impacts (that were unavoidable) were reduced through mitigation, management and rehabilitation measures.

Although the freshwater impacts were considered low, it is proposed that the ecological condition of the Modderas River and its tributaries within the property be improved by removing invasive alien plants within the watercourse corridors and revegetation with indigenous vegetation.

The EAP believes that the proposed development will be the best practicable environmental option. It would be the option that provides the most benefits, as a whole, at an acceptable cost, in the long term as well as in the short term.

SECTION J: GENERAL

- **Environmental Impact Statement**

1.1.	Provide a summary of the key findings of the EIA.

It is proposed to enlarge the existing Modderas Dam to a capacity of 310,000 m³. The water use on Portion 1 of farm Roode Zands Kloof 66, Tulbagh, was verified, and a total volume of 421,470 m³/a was confirmed as ELU. The existing water use involved a volume of 363,460 m³/a from surface water sources and 58,010 m³/a from groundwater. The total combined storage that can be regarded as ELU was confirmed to be 231,000 m³ in two storage dams.

A total combined area of 66,5ha will be irrigated on the property. The storage dam will only provide buffer storage (security) that will be filled during winter to ensure that the required water demand during summer can be met. The Modderas Dam will ensure that water will always be available for irrigation.

Drought and climate change have prompted the applicant to prioritise securing his water sources. It is proposed to increase the storage capacity on the property to provide greater certainty of water for the irrigation of permanent crops during the summer. It was therefore proposed to decommission Dam 2 with a capacity of 31,000 m³. Dam 2 was investigated, and it was found that it requires maintenance to prevent leaks. A cost estimate has shown that it will be more cost-effective to decommission Dam 2 and to add the capacity to the Modderas Dam. Since the Modderas Dam will be enlarged to include the storage capacity of Dam 2, it was decided to create more storage in terms of the taking of surface water that was confirmed as ELU. It is proposed to store 60% of the additional surface water taking of 132,460 m³ into the Modderas Dam.

The project will involve the following components:

- *Enlargement of Modderas Dam from 200,000 m³ with a current wall height of 13,8m to a gross storage capacity of 310,000 m³ with a wall height of 15.1m. The proposed total footprint area will be 7.5 ha.*
- *Extension of the existing Ø200 mm Class 6 uPVC outlet pipe on the upstream side.*
- *Decommissioning of Dam D2. Decommissioning of Dam D2 would involve leaving the dam as is and not storing any water in the dam, apart from natural runoff and rainwater.*

The instream habitat integrity of the Modderas River is considered moderately modified, while the riparian habitat has been moderately to substantially modified. The river is considered of moderate ecological importance and sensitivity. The recommended ecological condition of the Modderas River is that it is maintained within the ecological category of C (moderately modified).

The impact assessment is for the preferred alternative (enlarging the existing 200,000 m³ Modderas Dam to 310,000 m³ and decommissioning of Dam D2 of 31,000 m³). The potential aquatic ecosystem impacts associated with the proposed dam enlargement are:

- *Modified flow in the watercourse downstream of the dam.*
- *Disturbance and modification of the aquatic habitat within the dam basin of the enlarged dam.*
- *Short-term water quality impacts during the construction works.*
- *Indirect impact on aquatic biota.*

The Modderas Dam is an instream dam on the lower Modderas Tributary of the Klein Berg River. The tributary contributes less than 1% of the flow to the Klein Berg River. The enlargement dam would likely, however, be a greater than 1 MAR dam, which implies it will likely not spill every year, only in wetter-than-average years. Environmental flow mitigation will be necessary to maintain the downstream watercourse. There is a tributary that joins the Modderas River downstream of the dam, which contributes about 40% of the flow in the lower river. The dam to be decommissioned (Dam D2) receives water from a diversion from this tributary. There is thus potential to ensure the EWR contribution for the lower river is from the tributary. There is a small instream dam on this stream. Although it is on the adjacent property, this may reduce the ability to utilise this watercourse to mitigate the flow impact and implement the recommended environmental flow requirement.

Dam D2, proposed to be decommissioned, has long been in existence. The embankment of the dam and the adjacent area comprise largely natural vegetation cover. The area immediately to the east of the dam also includes a wider riparian and seep area associated with the smaller tributary of the Modderas River.

The following mitigation measures are recommended:

- *The area immediately to the east of Dam D2 which is to be decommissioned comprises a wider riparian and seep area associated with the smaller tributary of the Modderas River. With decommissioning of the dam, it is important the disturbance of these areas be avoided and that the dam basin simply be filled with soil that is free of alien vegetation seed.*
- *With regards to the implementation of the EWR in the lower Modderas Tributary, it is recommended that the smaller tributary that drains past Dam D2 be utilised to meet the environmental flow requirement. In the decommissioning of Dam D2, the dam should simply be left as is but no longer store water (i.e divert water to it and abstract from it). Only the natural rainfall and runoff into the dam should be retained in the dam and allowed to seep out. There is quite a bit of natural vegetation in and around the dam that it would be best to not disturb.*

- *A programme should be put in place for the ongoing removal and control of invasive alien vegetation along the river corridors and in the wetland areas within the property, and in particular within the Modderas Tributary that is proposed to provide for the EWR downstream of Modderas Dam. Removal of invasive vegetation and revegetation of the aquatic habitats could be informed by an adopted Maintenance Management Plan (MMP) for the property (Annexure 6 of the EMPr attached as **Appendix H**).*
- *The construction works at the dam should take place during the driest months of the year to prevent any flow and water quality (sedimentation) impacts and should be carried out in conjunction with an approved EMP that addresses aspects such as prevention and containment of any contaminated runoff and chemical spills from the construction site; provision of ablution facilities at the construction site that are at least 30m from the watercourse, and mitigation of excessive sedimentation arising from the works.*
- *Disturbance of the natural vegetation cover upstream of the dam and immediately downstream of the dam within the watercourse should be avoided. Any disturbed areas that are located immediately outside of the dam basin should be rehabilitated by reshaping the area to resemble that of the surrounding natural landscape and where necessary, these areas should be planted with suitable local indigenous vegetation.*
- *The disturbed areas at the dam should also be monitored for the growth of invasive alien vegetation and any recruitment of alien plants should be removed. Longer-term maintenance activities associated with the operation of the dam should follow an adopted MMP (Annexure 6 of the EMPr attached as **Appendix H**) for the property.*
- *No stocking of the dam with alien fish should be allowed. Any stocking of the dam would need to get prior approval from CapeNature.*
- *Indigenous vegetation observed along the watercourse that is suitable for revegetation of cleared areas comprises Psoralea pinnata, Searsia angustifolia, Morella serrata, Olea europaea subsp. africana, Podocarpus elongatus, Melianthus major, Pteridium aquilinum, Salvia chamelaeagnea, Elegia capensis, Zantedeschia aethiopica, Carpha glomerata, Juncus capensis, Ficinia nodosa, Cyprus textilis and Isolepis prolifera. Little to no natural vegetation will be lost.*

No significant impacts on fauna are expected.

No heritage resources will be effected and the character of the site will remain the same.

Water surety enables the farmer to run a more successful farming operation which has benefits for those employed. An improvement in agricultural production results in an increase in the economic development of the region.

*The risk rating is considered to be **Moderate to Low negative**. A water use application will be submitted for the associated Section 21 c&i water use as well as for the storage of water in the dam.*

1.2.	Provide a map that superimposes the preferred activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers. (Attach map to this BAR as Appendix B2)

*A map that superimposes the preferred activity on the environmental sensitivities is attached as **Appendix B2**.*

1.3.	Provide a summary of the positive and negative impacts and risks that the proposed activity or development and alternatives will have on the environment and community.

The potential impacts on the aquatic ecosystem associated with the proposed enlargement of the Modderas Dam (preferred alternative) are listed below.

Negative:

- *Modified flow in the watercourse downstream of the dam.*
- *Disturbance and modification of the aquatic habitat within the dam basin of the enlarged dam.*
- *Short-term water quality impacts during the construction works.*
- *Indirect impact on aquatic biota.*

Positive:

- *Improved water security for the irrigation of fruit trees on the farm.*
- *Decommissioning of Dam 2, facilitating the implementation of the Environmental Flow Release (the existing dam has no release requirement), and rehabilitation of the associated aquatic habitats.*

Site Alternative 1 would result in the loss of orchards and has a small catchment area with limited runoff, making the dam dependent on pumped water and thus impractical and uneconomical. Alternative 2 lies within a mapped Critical Biodiversity Area, is likely to be opposed by DEADP, and new on-channel dams are generally discouraged by DWS. As it would also have a greater impact on the stream than enlarging Modderas Dam, it was ruled out.

- **Recommendations of the Environmental Assessment Practitioner ("EAP")**

2.1.	Provide Impact management outcomes (based on the assessment and, where applicable, specialist assessments) for the proposed activity or development for inclusion in the EMPr.

The following impact management outcomes for the proposed development will be included in the EMPr.

PRE-DEVELOPMENT PHASE

- *Demarcation of No-Go areas: no disturbance is allowed within these areas. All watercourses are considered no-go areas.*
- *Access roads: Minimise impact to the environment by only using existing roads.*
- *Site facilities: Provide clean toilet facilities, eating areas and potable water to all staff in an effort to minimise the risk of disease and impact on the environment and health impacts.*

DEVELOPMENT PHASE

- *Workshop, equipment maintenance and storage areas: Soil, surface water and groundwater contamination must be minimised.*
- *Storage, handling, use and disposal of hazardous substances: Safe storage, handling, use and disposal of hazardous substances.*
- *Cement / Concrete Batching: To control concrete and cement batching activities to minimise spillages and contamination of soil, surface water and groundwater.*
- *General aesthetics: Neat and well-maintained site to minimise visual impacts.*
- *Solid waste management: Wastes are appropriately stored, handled and safely disposed of at a licensed waste facility.*
- *Noise control: To prevent unnecessary noise in the environment by ensuring that noise from construction activity is mitigated, as far as possible.*
- *Dust control: Dust prevention measures are applied to minimise the generation of dust.*
- *Storm- and wastewater management: To avoid pollution and erosion as a result of storm- or wastewater runoff.*
- *Topsoil use: Impacts on the environment are minimised when topsoil is removed, and sufficient topsoil is available for rehabilitation.*
- *Stockpiling and stockpile areas: To reduce erosion and sedimentation as a result of stockpiling.*
- *Protection of fauna: Any animals encountered during construction should be left unharmed and allowed to move to natural areas safely.*
- *Protection of heritage resources (if any): Impact on heritage resources is minimised.*
- *Emergency procedures: Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies.*
- *Fire Prevention: Prevention of uncontrollable fires.*
- *Site safety and security: All safety and security measures are in place.*
- *Public safety: All precautions are taken where possible to minimise the risk of injury, harm or complaints.*
- *Landscaping and rehabilitation: No environmental degradation occurs as a result of the development.*

OPERATIONAL PHASE

- *Invasive alien clearing: Invasive alien plants must be removed from all watercourses on the property.*
- *Soil erosion: Disturbed areas must be rehabilitated to prevent erosion.*
- *Maintenance of Infrastructure: Ensure that all facilities and infrastructure are maintained and in good working order.*

*In addition, all the mitigation measures recommended by the Freshwater Specialist, as listed in question 2.2 below, will be included in the EMPr and Maintenance Management Plan (MMP). Refer to the EMPr and MMP (**Appendix H**).*

2.2.	Provide a description of any aspects that were conditional on the findings of the assessment, either by the EAP or specialist, that must be included as conditions of the authorisation.

The following mitigation measures must be included as conditions of approval:

- *The EMPr (including a Maintenance Management Plan) must be adhered to.*
- *The area immediately to the east of Dam D2 which is to be decommissioned comprises a wider riparian and seep area associated with the smaller tributary of the Modderas River. With decommissioning of the dam, it is important the disturbance of these areas be avoided and that the dam basin simply be filled with soil that is free of alien vegetation seed.*
- *With regards to the implementation of the EWR in the lower Modderas Tributary, it is recommended that the smaller tributary that drains past Dam D2 be utilised to meet the environmental flow requirement. In the decommissioning*

of Dam D2, the dam should simply be left as is but no longer store water (i.e divert water to it and abstract from it). Only the natural rainfall and runoff into the dam should be retained in the dam and allowed to seep out. There is quite a bit of natural vegetation in and around the dam that it would be best to not disturb.

- *A programme should be put in place for the ongoing removal and control of invasive alien vegetation along the river corridors and in the wetland areas within the property, and in particular within the Modderas Tributary that is proposed to provide for the EWR downstream of Modderas Dam. Removal of invasive vegetation and revegetation of the aquatic habitats could be informed by an adopted Maintenance Management Plan (MMP) for the property (Annexure 6 of the EMPr attached as **Appendix H**).*
- *The construction works at the dam should take place during the driest months of the year to prevent any flow and water quality (sedimentation) impacts and should be carried out in conjunction with an approved EMP that addresses aspects such as prevention and containment of any contaminated runoff and chemical spills from the construction site; provision of ablution facilities at the construction site that are at least 30m from the watercourse, and mitigation of excessive sedimentation arising from the works.*
- *Disturbance of the natural vegetation cover upstream of the dam and immediately downstream of the dam within the watercourse should be avoided. Any disturbed areas that are located immediately outside of the dam basin should be rehabilitated by reshaping the area to resemble that of the surrounding natural landscape and where necessary, these areas should be planted with suitable local indigenous vegetation.*
- *The disturbed areas at the dam should also be monitored for the growth of invasive alien vegetation and any recruitment of alien plants should be removed. Longer-term maintenance activities associated with the operation of the dam should follow an adopted MMP (Annexure 6 of the EMPr attached as **Appendix H**) for the property.*
- *No stocking of the dam with alien fish should be allowed. Any stocking of the dam would need to get prior approval from CapeNature.*
- *Indigenous vegetation observed along the watercourse that is suitable for revegetation of cleared areas comprises Psoralea pinnata, Searsia angustifolia, Morella serrata, Olea europaea subsp. africana, Podocarpus elongatus, Melianthus major, Pteridium aquilinum, Salvia chamelaeagnea, Elegia capensis, Zantedeschia aethiopica, Carpha glomerata, Juncus capensis, Ficinia nodosa, Cyprus textilis and Isolepis prolifera.*

2.3.	Provide a reasoned opinion as to whether the proposed activity or development should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be included in the authorisation.

The proposed enlargement of the Modderas Dam from 200,000 m³ to 310,000 m³ represents a feasible, practical, and least environmentally damaging option for securing long-term water supply for the farming operation. An analysis of alternatives showed that the repair/enlargement of Dam D2 would result in the loss of established orchards and depend on pumped water, rendering it uneconomical and impractical. A new on-channel dam (Alternative 2) would fall within a mapped Critical Biodiversity Area and cause greater ecological disturbance, while also likely to be opposed by regulatory authorities. Of the engineering design options, Option 1 (upstream embankment raising) was selected as the preferred option because it balances cost-effectiveness with minimising impacts, while avoiding relocation of infrastructure.

The enlargement will have some negative impacts on the aquatic ecosystem, including modified flows downstream, disturbance of aquatic habitat, and short-term construction-related water quality impacts. However, these are largely manageable through mitigation, which includes ensuring the EWR downstream via the decommissioning of Dam D2, careful scheduling of works in the dry season, adoption of an EMPr, rehabilitation of disturbed areas, and ongoing removal of invasive alien vegetation. With mitigation, the significance of impacts reduces to low negative, and ecological functioning downstream can be enhanced through active management and habitat restoration.

If Dam D2 is left as is with no storing of water, it will avoid the disturbance of nearby natural areas.

The project also has positive impacts, including:

- *Improved water security for fruit production, which supports agricultural productivity and job security.*
- *Implementation of the first formal EWR in the tributary, improving downstream ecological integrity.*
- *Rehabilitation of aquatic habitats associated with the decommissioned Dam D2.*

An existing dam will be expanded rather than the development of a new dam.

Little to no natural vegetation will be lost.

Fauna will not be negatively impacted by the proposal.

The No-Go alternative would result in the lowest level of impact but would fail to address the water security challenges of the farm. It would not enable environmental flow implementation or habitat rehabilitation and would reduce water security for the farming enterprise, particularly during droughts.

On balance, the proposed development provides a net benefit by enhancing water security and agricultural resilience, while introducing measures to mitigate and offset ecological impacts. Provided that strict compliance with the mitigation measures and licence conditions is enforced, the proposed enlargement of Modderas Dam should therefore be authorised subject to conditions.

The EAP believes that the preferred alternative will be the best practicable environmental option. It would be the option that provides the most benefits overall at an acceptable cost.

The following mitigation, management and monitoring measures must be conditions of approval:

- *An Environmental Control Officer (ECO) must be appointed to oversee the construction phase (including the implementation of the EMPr and any applicable conditions of the environmental authorisation).*
- *ECO should conduct at least one site visit per month.*
- *All mitigation measures detailed in the EMPr and MMP (**Appendix H**) must be adhered.*

2.4.	Provide a description of any assumptions, uncertainties and gaps in knowledge that relate to the assessment and mitigation measures proposed.

Should the proposed project be authorised, it is assumed that the monitoring and mitigation measures outlined in this report and the EMPr will be incorporated into the design, construction and operation of the proposed development.

ASSUMPTIONS

The EAP's assumptions:

- *All mitigation, management, and monitoring measures prescribed in this BAR and the accompanying EMPr will be implemented by the developer. Effective management of the site is essential, and the specialist's recommended mitigation measures must be implemented. This has a significant bearing on the reliability of the predictions of the significance of impact.*

The freshwater specialist's assumptions:

Limitations and uncertainties often exist within the various techniques adopted to assess the condition of ecosystems. The following restrictions apply to the methods and methodology utilised to undertake this study:

- *Analysis of the freshwater ecosystems was undertaken at a rapid level and did not involve detailed habitat and biota assessments.*
- *The river health assessment was carried out using the South African Department of Water and Sanitation's methodologies. River Health assessments were carried out to provide information on the ecological condition, ecological importance, and sensitivity of the river systems impacted.*
- *The guideline document, "A Practical Field Procedure for the Identification and Delineation of Wetlands and Riparian Areas", as published by DWAF (2005), was followed for the delineation of the riparian and wetland areas.*
- *The ecological importance and sensitivity assessment were conducted according to the guidelines, as developed by DWAF (1999).*
- *The species mentioned in this report do not comprise a comprehensive list of all species which occur at the site. They are mentioned for descriptive purposes.*

The level of aquatic assessment undertaken was considered to be adequate for this study.

UNCERTAINTIES

Uncertainties result when mitigation measures are proposed and must be implemented. The management and implementation of these mitigation measures must be closely monitored and effectively managed to ensure that all identified mitigation measures are successfully brought to fruition.

GAPS IN KNOWLEDGE

At this stage, there are no identified gaps in knowledge within this report.

2.5.	The period for which the EA is required, the date the activity will be concluded and when the post-construction monitoring requirements should be finalised.

- *Commencement of the EA should occur within 5 years from the date of issue of the EA.*
- *Completion of the activities should occur within 5 years from the date of commencement.*
- *It is recommended that ECO monitoring be undertaken once a month during construction.*
- *A final Environmental Audit must be undertaken on completion of the development phase (i.e. after construction is finished).*

- **Water**

Since the Western Cape is a water-scarce area, explain what measures will be implemented to avoid the use of potable water during the development and operational phase, and what measures will be implemented to reduce your water demand, save water and reuse or recycle water.

The proposed enlarged dam will take water from the Modderas River for irrigation purposes. No potable water will be used. The relevant farm portions have an existing lawful use (ELU) to abstract surface water from the Modderas River. A water use licence application (WULA) will be submitted for the additional storage of water. Water will be stored in the enlarged dam in winter for irrigation use in summer. This will reduce demand on the Modderas River during periods of low summer flow and high demand, and enhance water security for the applicant.

- **Waste**

Explain what measures have been taken to reduce, reuse or recycle waste.
No waste will be produced.

- **Energy Efficiency**

8.1.	Explain what design measures have been taken to ensure that the development proposal will be energy efficient.
This is not an energy-intensive activity.	

SECTION K: DECLARATIONS

DECLARATION OF THE APPLICANT

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

I, Mr. Phil du Plessis, ID number 860524 5125 081 in my personal capacity or duly authorised thereto, hereby declare/affirm that all the information submitted or to be submitted as part of this application form is true and correct, and that:

- I am fully aware of my responsibilities in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA"), the Environmental Impact Assessment ("EIA") Regulations, and any relevant Specific Environmental Management Act and that failure to comply with these requirements may constitute an offence in terms of relevant environmental legislation;
- I am aware of my general duty of care in terms of Section 28 of the NEMA;

- I am aware that it is an offence in terms of Section 24F of the NEMA should I commence with a listed activity prior to obtaining an Environmental Authorisation;

- I appointed the Environmental Assessment Practitioner ("EAP") (if not exempted from this requirement), which:
  - meets all the requirements in terms of Regulation 13 of the NEMA EIA Regulations; or
  - meets all the requirements other than the requirement to be independent in terms of Regulation 13 of the NEMA EIA Regulations, but a review EAP has been appointed, which meets all the requirements of Regulation 13 of the NEMA EIA Regulations;

- I will provide the EAP and any specialist, where applicable, and the Competent Authority with access to all information at my disposal that is relevant to the application;

- I will be responsible for the costs incurred in complying with the NEMA EIA Regulations and other environmental legislation, including but not limited to –
  - costs incurred for the appointment of the EAP or any legitimate person contracted by the EAP;
  - costs in respect of any fee prescribed by the Minister or MEC in respect of the NEMA EIA Regulations;
  - Legitimate costs in respect of specialist(s) reviews; and
  - the provision of security to ensure compliance with applicable management and mitigation measures;

- I am responsible for complying with conditions that may be attached to any decision(s) issued by the Competent Authority, hereby indemnify, the government of the Republic, the Competent Authority and all its officers, agents and employees, from any liability arising out of the content of any report, any procedure or any action for which I or the EAP is responsible in terms of the NEMA EIA Regulations and any Specific Environmental Management Act.

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

04.12.2025

Signature of the Applicant: Date:

MODDERASRIVIER BOERDERY

Name of company (if applicable):

DECLARATION OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER ("EAP")

I, **Lindsay Speirs du Toit**, EAP Registration number **2019/1470** as the appointed EAP, hereby declare/affirm the correctness of the:

- Information provided in this BAR and any other documents/reports submitted in support of this BAR;
- The inclusion of comments and inputs from stakeholders and I&APs;
- The inclusion of inputs and recommendations from the specialist reports where relevant; and
- Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties, and that:
- In terms of the general requirement to be independent:
  - other than fair remuneration for work performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
  - am not independent, but another EAP that meets the general requirements set out in Regulation 13 of NEMA EIA Regulations has been appointed to review my work (Note: a declaration by the review EAP must be submitted);
- In terms of the remainder of the general requirements for an EAP, I am fully aware of and meet all of the requirements, and that failure to comply with any of the requirements may result in disqualification;
- I have disclosed to the Applicant, the specialist (if any), the Competent Authority and registered interested and affected parties, all material information that has or may have the potential to influence the decision of the Competent Authority or the objectivity of any report, plan or document prepared or to be prepared as part of this application;
- I have ensured that information containing all relevant facts in respect of the application was distributed or was made available to registered interested and affected parties and that participation will be facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments;
- I have ensured that the comments of all interested and affected parties were considered, recorded, responded to and submitted to the Competent Authority in respect of this application;
- I have ensured the inclusion of inputs and recommendations from the specialist reports in respect of the application, where relevant;
- I have kept a register of all interested and affected parties that participated in the public participation process; and
- I am aware that a false declaration is an offence in terms of Regulation 48 of the NEMA EIA Regulations;

4 December 2025

Signature of the EAP: Date:

Trading as EarthGrace Environmental Consultancy

Name of company (if applicable):

DECLARATION OF THE SPECIALIST

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

- In terms of the general requirement to be independent:
  - other than fair remuneration for work performed in terms of this application, have no business, financial, personal or other interest in the development proposal or application and that there are no circumstances that may compromise my objectivity; or

  - ~~am not independent, but another specialist (the "Review Specialist") that meets the general requirements set out in Regulation 13 of the NEMA EIA Regulations has been appointed to review my work (Note: a declaration by the review specialist must be submitted~~);

- In terms of the remainder of the general requirements for a specialist, have throughout this EIA process met all of the requirements?

- I have disclosed to the applicant, the EAP, the Review EAP (if applicable), the Department and I&APs all material information that has or may have the potential to influence the decision of the Department or the objectivity of any Report, plan or document prepared or to be prepared as part of the application; and

- I am aware that a false declaration is an offence in terms of Regulation 48 of the EIA Regulations.

Signature of the Specialist

4 December 2025

Date

BlueScience (Pty) Ltd

Name of company (if applicable):

DECLARATION OF THE SPECIALIST

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

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

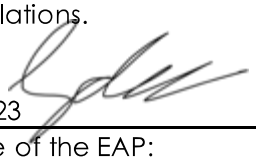
- In terms of the general requirement to be independent:
  - other than fair remuneration for work performed in terms of this application, have no business, financial, personal or other interest in the development proposal or application and that there are no circumstances that may compromise my objectivity; or

  - am not independent, but another specialist (the "Review Specialist") that meets the general requirements set out in Regulation 13 of the NEMA EIA Regulations has been appointed to review my work (Note: a declaration by the review specialist must be submitted);

- In terms of the remainder of the general requirements for a specialist, have throughout this EIA process met all of the requirements?

- I have disclosed to the applicant, the EAP, the Review EAP (if applicable), the Department and I&APs all material information that has or may have the potential to influence the decision of the Department or the objectivity of any Report, plan or document prepared or to be prepared as part of the application; and

- I am aware that a false declaration is an offence in terms of Regulation 48 of the EIA Regulations.



2025/09/23 2025/09/23

Signature of the EAP: Date:

Hagen Brink Consulting Engineers

Name of company (if applicable):