Mulilo De Aar PV
Application for extension of the EA validity period

Part 1 EA Amendment Application

Remainder of Portion 1 of the Farm De Aar No 180
De Aar, Northern Cape Province

Draft Motivation Report

July 2022

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Project Detail

Project Name	Mulilo De Aar PV: Application for extension of the EA validity period
DFFE Reference Number	12/12/20/2499
Report Status	Draft Motivation Report
Date of Report	July 2022
Purpose of Report	Public review and comment Review and comment from the Competent Authority Distribution for a 30-day commenting period

Contact

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Environmental Assessment Practitioners	Landscape Dynamics Environmental Consultants (Pty) Ltd - Susanna Nel (082 888 4060) - Annelize Erasmus (082 566 4530) - info@landscapedynamics.co.za

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(F9) Certified Affirmation by EAP

List of Abbreviations

BAR Basic Assessment Report
BESS Battery Energy Storage System
BID Background Information Document
CBA Critical Biodiversity Area
dBAR Draft Basic Assessment Report
DFFE National Department of Forestry, Fisheries & the Environment
DSR Draft Scoping Report
DWS Department of Water & Sanitation
DMR Department of Mineral Resources
EA Environmental Authorisation
EAP Environmental Assessment Practitioner
ECO Environmental Control Officer
EIA Environmental Impact Assessment
EIR Environmental Impact Report
EMF Environmental Management Framework
EMPr Environmental Management Programme
ESA Ecological Support Area
Eskom SOC South Africa's Electricity Supply Commission (State Owned Company)
EWT Endangered Wildlife Trust
fBAR Final Basic Assessment Report
GNR Government Notice Regulation
ha Hectare(s)
HIA Heritage Impact Assessment
IAPs Interested and Affected Parties
ICNIRP International Commission for Non-Ionising Radiation Protection
IDP Integrated Development Plan
IPPPP Independent Power Producer Procurement Programme
IEM Integrated Environmental Management
IEP Integrated Energy Plan
IPP Independent Power Producer
ISEP Integrated Strategic Electricity Planning
kW Kilowatt (1kW= 1 000W)
m^3 Cubic metres
Mamsl Metres above mean sea level
MTS Main Transmission Substation
MVA Mega Volt Ampére
MW Megawatt (1MW=1 000kW)
NERSA National Energy Regulator of South Africa
NDP Network Development Plan
PIA Palaeontological Impact Assessment
PPP Public Participation Process/Programme
PV Photovoltaic (solar panels)
REIPPPP Renewable Energy Independent Power Producer Procurement Programme
SAHRA South African Heritage Resources Agency
SANBI South African National Biodiversity Institute
SR Scoping Report
PHRA Provincial Heritage Resources Authority
PoS Plan of Study
SIP Strategic Infrastructure Project
SDF Spatial Development Framework
SS Substation
ToR Terms of Reference
TRF Transnet Freight Rail
TS Traction Station / Traction Substation
WULA Water Use License Application

LEGISLATION

NEMA National Environmental Management Act, 1998 (Act 107 of 1998)
NEMAQA National Environmental Management Air Quality Act, 2004 (Act 39 of 2004)
NEMPAA National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003)
NEMWA National Environmental Management Waste Act, 2008 (Act 59 of 2008)
NWA National Water Act, 1998 (Act 36 of 1998)

CHAPTER 1: INTRODUCTION

1.1 Background

1.1.1 Part 1 EA Amendment Application

The original Environmental Authorisation (EA) for the Mulilo De Aar PV Solar Energy Facility (SEF) was issued on 9 July 2012 and was valid until 9 July 2022. A Part 1 EA Amendment Application for the extension of the validity period was subsequently made in June 2022 to the Department of Forestry, Fisheries & Environment (DFFE), which is the Competent Authority for this project.

The major concern with the extension of the EA validity for a period longer than 10 years is that the environment could have changed and needs to be re-assessed. The DFFE therefore requested that additional information in terms of Regulation 30(1)(a) of the EIA Regulations, 2014 as amended, must be submitted to the DFFE in order to be able to process the EA Amendment Application. This Motivation Report contains the requested information and is distributed for public participation as per the DFFE's stipulations.

The validity period of the existing EA was extended to 12 September 2022 and the following needs to be done before this date:

- Compile the Draft Motivation Report (inclusive of specialist studies);
- Distributed the Draft Motivation Report for a 30-day commenting period;
- Compile the Final Motivation Report; and
- Submit the Final Motivation Report to DFFE on/before 12 September 2022.07.21

Failure to conduct the above-mentioned actions within the stipulated timeframe will cause the current application to lapse and application for a new EA will have to be made to the DFFE.

1.1.2 Existing Environmental Authorisations and Amendments

Table 1: Existing Environmental Authorisations and Amendments

DFFE Document, Date & Reference Number	Document Description
Environmental Authorisation (EA) Date issued : 9 July 2012 Reference Number : 12/12/20/2499	• Authorisation of relevant listed activities in terms of the 2010 EIA Regulations in terms of NEMA
EA Amendment Date issued : 28 September 2012	• Applicant name change from Mulilo Renewable

Reference Number : 12/12/20/2499-AM1	Energy (Pty) Ltd to Mulilo Sonnedix De Aar (Pty) Ltd • Change of powerline from 132kV to 220kV with new route coordinates
EA Amendment Date issued : 8 March 2013 Reference Number : 12/12/20/2499-AM2	• Applicant name change from Mulilo Sonnedix De Aar (Pty) Ltd to Mulilo De Aar PV (Pty) Ltd • Powerline changed back from 220kV to 132kV • First amendment is declared nulled and void
EA Amendment Date issued : 15 April 2015 Reference Number : 12/12/20/2499-AM3	• Extension of validity period to 9 July 2017
EA Amendment Date issued : 6 April 2017 Reference Number : 12/12/20/2499-AM4	• Change of address of Applicant • Extension of validity period to 9 July 2020 • Amendment of the property description from Portion 1 of the farm Badenhorst No 180 to Portion 1 of the farm De Aar No 180
EA Amendment Date issued : 9 July 2020 Reference Number : 12/12/20/2499-AM5	• Extension of validity period to 9 July 2022
EA Amendment Date issued : 8 June 2021 Reference Number : 12/12/20/2499-AM6	• Applicant name change from Mulilo De Aar PV (Pty) Ltd to Mulilo Total Hydra Storage (Pty) Ltd • Amendment to project description to include a 9,9MW Auxiliary Generator • Approval of amended layout plan • Approval of Amended EMPr dated March 2021.
EA Amendment Date issued: 5 July 2021 Reference Number: 12/12/20/2499-AM7	• Removal of diesel storage tanks from the project components

1.1.3 The Mulilo Total Hydra Storage Project

The **Mulilo Total Hydra Storage (MTHS)** project consists of the following three solar facilities:

- 75MW Badenhorst Solar PV2;
- 75MW Badenhorst Dam Solar PV3; and
- 100MW Mulilo De Aar PV

Also refer to the map below showing the MTHS project.

These three SEFs will be developed as one project and it is envisaged that the development thereof will take place simultaneously.

The MTHS project is a Preferred Bidder in the Risk Mitigation Independent Power Producer Procurement Programme (RMIPPPP). The project is also a Strategic Infrastructure Project (SIP).

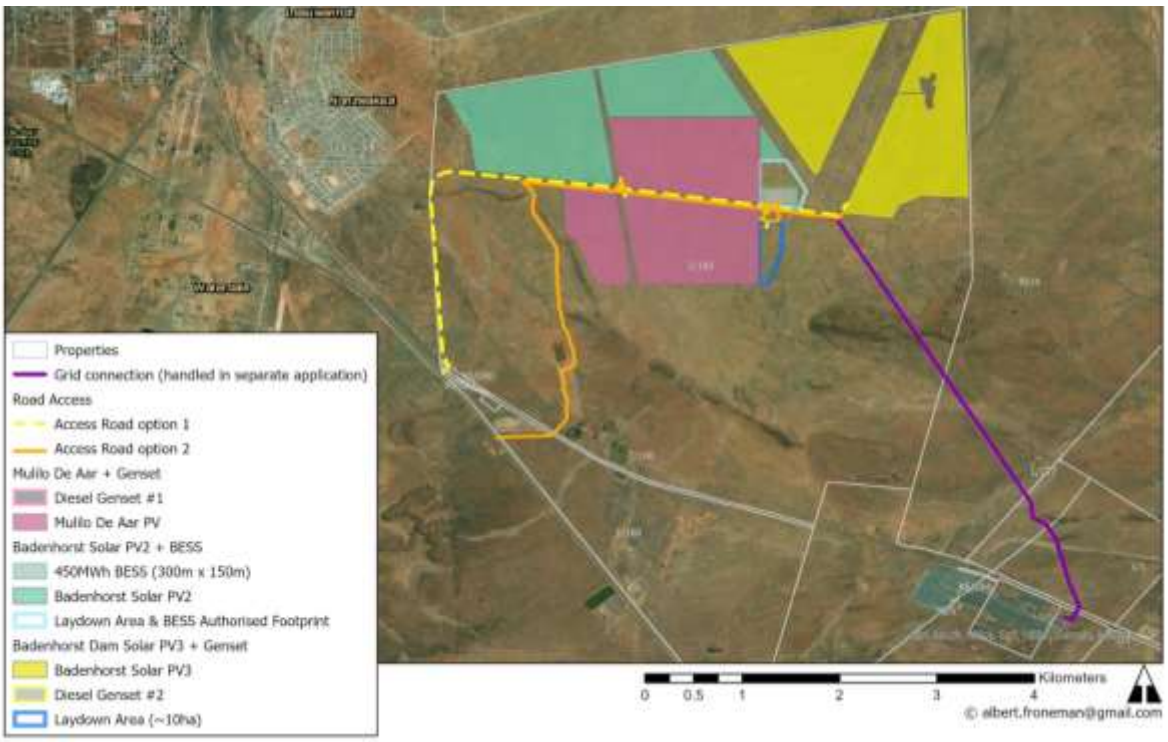


Figure 1: Mulilo Total Hydra Storage project

1.2 Locality

The proposed Mulilo De Aar PV SEF is situated on the Remainder of Portion 1 of the Farm De Aar No 180 approximately 2km to the south-east of De Aar within the Emthanjeni Local Municipality in the Northern Cape Province.

Figure 2: Locality Map

1.3 Details and Expertise of the Environmental Assessment Practitioners

Landscape Dynamics Environmental Consultants (Pty) Ltd is the environmental consultants appointed for this project. Landscape Dynamics is an environmental consultancy firm established in May 1997. The main line of business since that time up to the present is the compilation of Environmental Impact Assessments. Landscape Dynamics has a broad client base from both the private and government sectors which has developed over the past 24 years of professional services supplied.

The operating base for Landscape Dynamics is the entire South Africa; with local representation in Gauteng, the North West Province, Mpumalanga, Western Cape, Northern Cape and Limpopo.

The Environmental Assessment Practitioners (EAPs) for this project are Ms Susanna Nel and Ms Annelize Erasmus. Both EAPs are registered with EAPASA. The Landscape Dynamics Company Profile with the relevant condensed Curriculum Vitae is attached under Appendix F.

1.4 Project Team

The impact that this project might have on the environment can only be effectively assessed if all the environmental project components are satisfactorily identified and considered. A multi-disciplinary approach is therefore required for this basic Environmental Impact Assessment process.

The EIA Project Team members are the following (Landscape Dynamics' Company Profile with condensed CVs of the EAPs and Declaration of Interest of the specialists are attached in Appendix F):

Table 2: Project Team

Environmental Assessment Practitioners

Company name	Contact person(s)	Responsibility
Landscape Dynamics Environmental Consultants	Ms Susanna Nel Ms Annelize Erasmus	○ EIA process ○ EIA Project Management ○ EAPs ○ Public Participation Programme

Specialists

Company name	Contact person(s)	Specialist field of study
David Hoare Consulting	Mr David Hoare	Fauna & Flora
BlueScience	Ms Toni Belcher	Aquatic
Asha Consulting	Mr Jayson Orton	Heritage & Palaeontology
Arcus Consultancy Services SA	Mr Owen Davies	Avifauna
VRM Afrika	Mr Steve Stead	Visual
Johann Lanz Soil Scientist	Mr Johann Lanz	Agricultural
Afrimage Photography	Mr Albert Froneman	Mapping and GIS support

Engineers (technical input)

Company Name	Contact person	Engineering field of study
Interference Testing And Consultancy Services (Pty) Ltd	Mr Callie Fouché	RFI Impact Assessment
CivilConsult Consulting Engineers	Mr Leon Wentzel	Storm Water Management

Applicant

The EIA Project Team is supported by the following team members from within Mulilo Renewable Project Developments (Pty) Ltd, on behalf of the applicant, Mulilo Total Hydra Storage (Pty) Ltd:

Contact Person	Responsibility
Mr Warren Morse	Director: Solar & Energy Storage
Mr Andrew Pearson	Environmental Manager
Mr Ryan David Anderson	Permitting and Environmental Manager
Mr Lloyd Barnes	Junior Permitting and Environmental Manager
Mr Johan Janse van Rensburg	Project Engineer

CHAPTER 2: MOTIVATION FOR EXTENSION OF THE VALIDITY PERIOD

A motivation as to why the DFFE should extend the validity period of the EA, and thereby the commencement period of the authorised development, is provided below. The advantages and disadvantages associated with the approval or refusal to the request for extension are also provided.

2.1 Motivation to extend the validity period

The extension of the validity of the EA is required, because of the following issues:

- The MTHS project is Preferred Bidder in the RMIPPPP.
- Delay in implementation of the RMIPPPP was caused by the DNG Power Holdings court case. DNG, which was seeking to supply power from gas-fired plants had applied to have the RMIPPPP process halted, citing procedural irregularities, conflict of interest and corrupt activities that resulted in the improper awarding of preferred bidder status specifically to the three Karpowership projects.

It should be noted that the MTHS project consists of the following three solar facilities which will be developed as one project and it is envisaged that the development thereof will take place simultaneously:

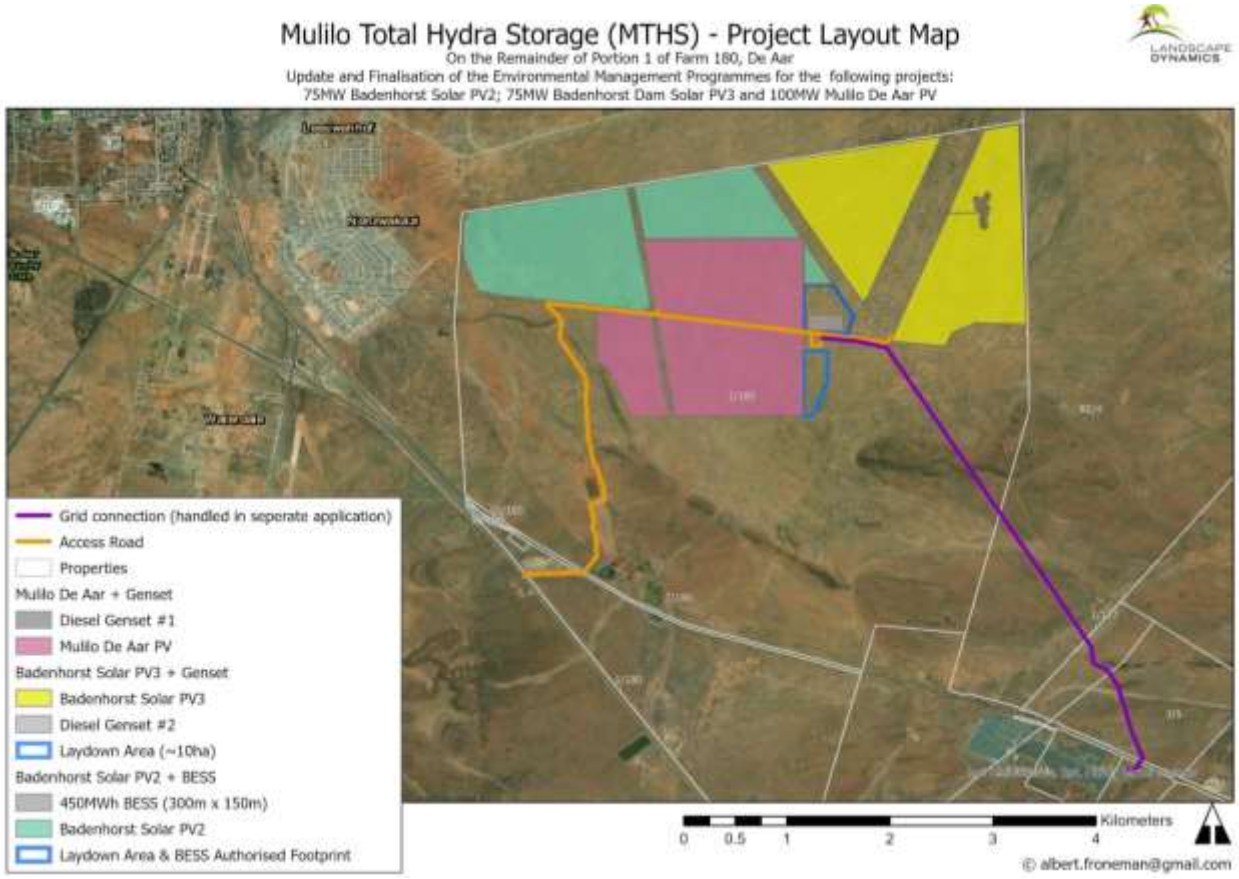
- 75MW Badenhorst Solar PV2
- 75MW Badenhorst Dam Solar PV3
- **100MW Mulilo De Aar PV (the subject of the application)**

Note that all the relevant NEMA authorisations for the above three PV facilities are currently in place, except for the EA of the Mulilo De Aar PV that will expire on 12 September 2022 if not extended.

Approved layout

- As stated above, the Mulilo De Aar PV forms part of the MTHS project. The final layout of this combined PV facility was approved as part of the MTHS Badenhorst PV2 EA Amendment (14/12/16/3/3/2/504/MP1) (attached under Appendix F) for the approval of the updated Badenhorst PV2 EMPr and the layout of the MTHS facility that includes the Mulilo De Aar PV. The EA Amendment was issued on 23 July 2021.
- The layout approved was guided by the Environmental Sensitivity Map which resulted from the specialist input obtained through numerous EA Amendment Applications and which was again confirmed during 2021. This Environmental Sensitivity Map is included under Appendix A of this application as well as in Section 4.9 of this report.

The maps below are also included under Appendix A.



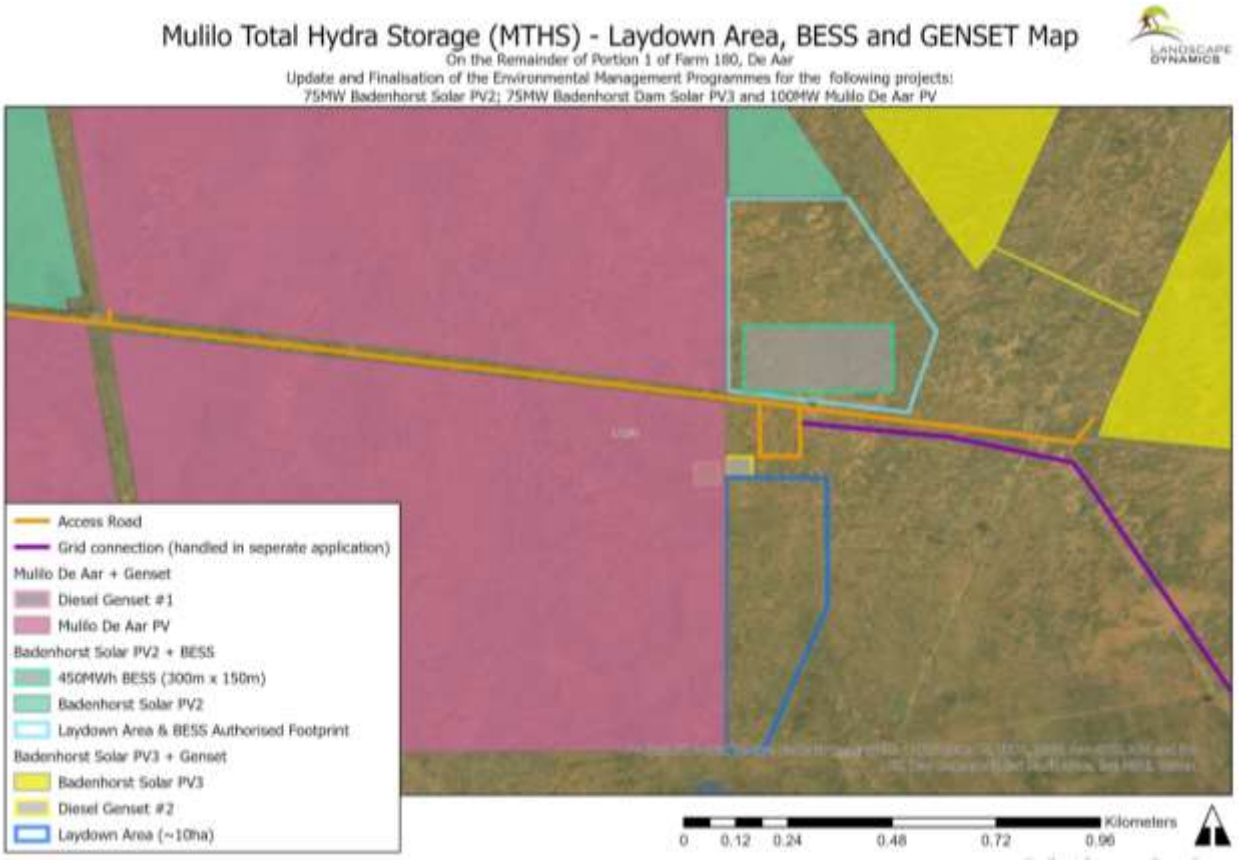


Figure 3: MTHS diagrammatical layout plan approved in 2021

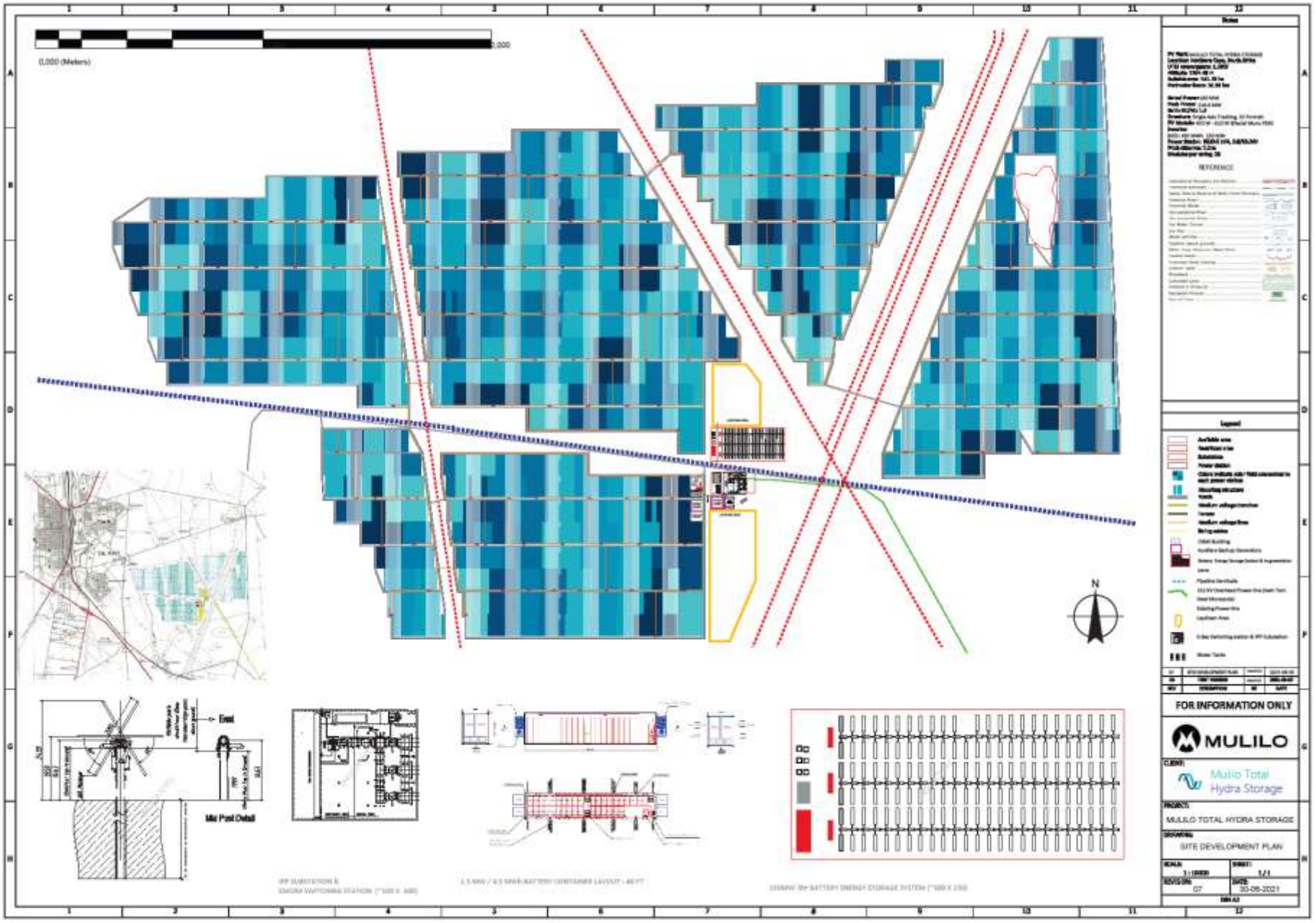


Figure 4: Approved layout plan

Specialist and Engineering Studies

Generally, the major concern with the extension of validity for a period longer than 10 years is that the environment (biophysical and social) could have changed and needs to be re-assessed. This concern is addressed in the specialist and engineering studies as summarised under Chapter 4 and Chapter 5 of this report. *They all confirmed that changes to the environment are insignificant, and that the impact assessments and recommended mitigation as provided in the original EIA are still valid.*

The relevant specialists confirmed the existing environmental constraints and ensured that it is appropriately addressed in the approved MTHS layout that includes the Mulilo De Aar PV SEF.

2.2 Advantages of granting/refusal of the extension

If this extension is granted, the implementation of the Mulilo Total Hydra Storage Project can take place. This will expedite the provision of clean energy into the national grid to address the severe power shortages currently experienced in the country, simultaneously assisting South Africa in meeting our climate change commitments.

2.3 Disadvantages of granting/refusal of the extension

If the extension is not granted, a new application for Environmental Authorisation of the Mulilo De Aar PV will have to be undertaken. This will lead to extensive additional expenses and a huge time delay that may result in MTHS losing preferred bidder status under the RMIPPPP. This will also result in forfeit, or at the very least significant delay, of the construction-ready renewable energy projects comprising the 75MW Badenhorst Solar PV2 and the 75MW Badenhorst Dam Solar PV3 facilities as well as the 100MW Mulilo De Aar PV which is the focus of this application.

Refusal of this amendment application will thus result in an unnecessary delay in addressing the serious need for additional renewable energy resources in South Africa.

CHAPTER 3: DFFE SCREENING TOOL

The DFFE Screening Tool is a new guideline that needs to be taken into consideration during the EIA/BA process for all new developments. The Screening Tool wasn't available during the EIA process undertaken in 2012 for the Mulilo De Aar PV project and has to be considered in this EA amendment application.

The DFFE Screening Tool Report is attached under Addendum B.

Environmental Sensitivities

The Screening Tool Report identified certain Environmental Sensitivities within the proposed development area and, based on these results recommend specialist studies that need to be undertaken.

These identified sensitivities are indicative only and must be verified on site by a suitably qualified person (the EAP or a specialist) before the need of the recommended specialist assessments can be confirmed.

The following table is applicable to the Mulilo De Aar PV SEF:

Table 3: Sensitivities identified in the Screening Tool

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme			X	
Animal Species Theme			X	
Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme	X			
Avian Theme				X
Civil Aviation (Solar PV) Theme			X	
Defence Theme				X
Landscape (Solar) Theme			X	
Palaeontology Theme		X		
Plant Species Theme				X
RFI Theme	X			
Terrestrial Biodiversity Theme	X			

Specialist assessments identified

Based on the selected classification and the environmental sensitivities of the proposed development footprint, a list of specialist assessments have been identified by the Screening Tool for inclusion in the assessment report. It is the responsibility of the EAP to confirm this list and to motivate the reason for not including any of the identified specialist studies where applicable.

The 13x Impact Assessments as mentioned below were identified in the Screening Tool Report. A motivation is provided, where applicable, next to each study as to why the recommendation is not required.

Note

Full impact assessments are not required for this EA Amendment Application (also refer to the Specialists' Terms of Reference in Chapter 4). The Screening Tool was used to determine whether any new specialist assessments are required which was not done during the 2012 EIA process.

Table 4: Specialist assessments identified in the Screening Tool

Impact Assessment	Motivation
Agricultural Impact Assessment	An *Agricultural Statement Letter* was compiled and is summarised in Chapter 4 and included under Appendix C.
Landscape / Visual Impact Assessment	A *Visual Statement* was compiled and is summarised in Chapter 4 and included under Appendix C.
Archaeological and Cultural Heritage Impact Assessment	An *Archaeological Statement Letter* was compiled and is summarised in Chapter 4 and included under Appendix C.
Palaeontology Impact Assessment	A *Palaeontological Statement Letter* was compiled and is summarised in Chapter 4 and included under Appendix C.
Terrestrial Biodiversity Impact Assessment	A *Terrestrial Ecological Statement Letter* was compiled and is summarised in Chapter 4 and included under Appendix C.
Aquatic Biodiversity Impact Assessment	An *Aquatic Statement Letter* was done and is summarised in Chapter 4 and included under Appendix C.
Civil Aviation Assessment	The SA Civil Aviation Authority provided consent for the MTHS project to proceed (refer to Appendix I for a copy of the Approval Letter).

Defence Assessment	The Defence Theme was rated as having a Low sensitivity, which indicates that further studies are not required. The SA Defence Force was however contacted for comment and they provided their consent (refer to Appendix I for a copy of the Consent Letter).
RFI Assessment	An *RFI Assessment* was compiled and is summarised in Chapter 5 and included under Appendix D.
Geotechnical Assessment	A Geotechnical Investigation has confirmed the feasibility of the MTHS site for development of a solar energy facility (refer to Appendix D). The applicant has undertaken site-specific geotechnical investigations during the design phase of the project. The final design of the foundations has been conducted by engineers strictly according to generally acceptable engineering standards and norms, taking the site-specific geotechnical constraints and recommendations into account.
Plant Species Assessment	This component is addressed under the *Terrestrial Ecological Statement Letter* as mentioned above.
Animal Species Assessment	This component is addressed under the *Terrestrial Ecological Statement Letter* as mentioned above.
Socio-economic Impact Assessment	A *Socio-economic Impact Assessment* was done and is summarised in Chapter 4 and included under Appendix C. .

The specialist and engineering studies as mentioned in the table above are summarised in Chapter 4 and 5 of this report.

CHAPTER 4: SPECIALIST STUDIES

4.1 Terms of Reference for the Specialists' Reports / Statement Letters

The specialists and engineers received the following Terms of Reference:

- Do a desktop study of studies undertaken during the initial baseline study undertaken in 2012.
- Describe the status (baseline) of the environment that was assessed during the initial assessment.
- Confirm the current status of the assessed environment – also refer to studies recently conducted (i.e. MTHS EMPr Update in 2021, BESS Studies, etc.) and highlight any changes when comparing to the initial assessment – if any.
- Undertake Site Verification if needed, or refer to recent site visits undertaken within this area / knowledge of the area if a site investigation is not required.
- Confirm it there are new assessments and/or guidelines which are now relevant which were not undertaken during the initial assessment. If so, please address appropriately in the report or else confirm that this was already addressed during recent studies undertaken in 2021.
- Confirm if cumulative impact will occur - if no cumulative impact, make a statement, or else provide a description and an assessment of the surrounding environment in relation to new developments or changes in land use which might impact on the Mulilo De Aar PV project. The assessment must consider the following:
    - Similar developments within a 30km radius (info to be obtained from the DFFE Screening Tool);
    - Identified cumulative impacts must be clearly defined, and where possible the size of the identified impact must be quantified and indicated, i.e., hectares of cumulatively transformed land;
    - Detailed process flow and proof must be provided, to indicate how the specialist's recommendations, mitigation measures and conclusions from the various similar developments in the area were taken into consideration in the assessment of cumulative impacts and when the conclusion and mitigation measures were drafted for this project;
    - The cumulative impacts significance rating must also inform the need and desirability of the proposed development;
    - A cumulative impact environmental statement on whether the proposed development must proceed;
- The study must conclude the following:
    - Has the baseline status of the environment changed since the initial EIA was done in 2012?

- Is the initial impact rating undertaken during the initial assessment still valid?
- Are the mitigation measures provided in the initial assessment still applicable?
- Are there any new mitigation measures that should be added to the Environmental Authorisation if the DFFE decides to extent the commencement period as per the application?

- A summary, description and assessment of any changes to the environment (if any) since the initial EA was issued.
- Confirmation that the MTHS Layout as approved in 2012 is still applicable.
- Final recommendation:
  - The environment in terms of my specialist field has not changed significantly since 2012; therefore, there is no objection to the extension of the validity of the Environmental Authorisation

    Or
  - Significant change in terms of my specialist field since 2012 is evident; therefore the extension of the validity of the Environmental Authorisation cannot be supported.

4.2 Previous specialist studies conducted vs studies in this report

Specialist studies were conducted for the MTHS PV projects (Badenhorst PV2, Badenhorst PV3 as well as Mulilo De Aar PV) for the following:

- Inclusion of Battery Energy Storage System (BESS) to the project description for
  - Badenhorst PV2
  - Badenhorst PV3
- Inclusion of Auxiliary Generator Set (Genset) to the project description for
  - Badenhorst PV3
  - Mulilo De Aar PV

These studies are mentioned to show that the area was widely visited and assessed by various specialists in their field since the original EA was issued in 2012. The specialists used for this EA Validity Extension application were also involved in previous projects and all specialists are very familiar with not just the Mulilo De Aar PV site, but also the wider area.

Table 5: Previous specialist studies undertaken for the MTHS projects

Specialist field	2012 Original EIA	2020 Inclusion of BESS Badenhorst PV2 Badenhorst PV3	2021 Inclusion of Genset Mulilo De Aar PV	2022 Extension of EA validity
Ecology (fauna & flora)	Yes	Yes	Yes	Yes
Avifauna	Yes	Yes	Yes	Yes
Aquatic	Yes	Yes	Yes	Yes
Heritage/Cultural and Palaeontology	Yes	Yes	Yes	Yes

Specialist field	2012 Original EIA	2020 Inclusion of BESS Badenhorst PV2 Badenhorst PV3	2021 Inclusion of Genset Mulilo De Aar PV	2022 Extension of EA validity
Visual	Yes	Yes	No	Yes
Agriculture	Yes	No	No	Yes
Hydrology	Yes	Yes	Yes	Yes
RFI	No	No	No	Yes
High Level Risk Assessment (BESS)	No	Yes	No	No
Noise (Genset)	No	No	Yes	No
Air (Genset)	No	No	Yes	No
Socio-economic	No	No	No	Yes

The EAPs are confident that the specialist studies as put forward in this report are sufficient to cover all aspects that could possibly impact on the biophysical and social environment and that an informed decision can be taken by the DFFE.

Summary of Specialist Studies

4.3 Fauna and Flora Statement Letter

A Fauna and Flora Statement Letter was compiled by Mr David Hoare (attached under Appendix C) and is summarised below.

FINDINGS OF THE ORIGINAL ASSESSMENT

The original ecological assessment for the Mulilo De Aar Solar PV was undertaken in 2011 and an ecological report was submitted, dated 6 February 2012. A recent site visit was undertaken on 4 March 2022 at which time a walk-through of the area was undertaken. It was found that conditions on site were the same as when the original survey was undertaken.

This original (2012) assessment identified three impacts for the project area, as follows:

- Loss or fragmentation of indigenous natural vegetation (Medium significance)
- Damage to wetlands/watercourses (Low significance)
- Establishment and spread of declared weeds and alien invader plants (Medium significance).

Based on the re-visit to the site and a review of the original report, these assessments are valid.

OMISSIONS FROM THE ORIGINAL ASSESSMENT

Northern Cape Critical Biodiversity Area

At the time of the original assessment, no Northern Cape Critical Biodiversity Area map existed. Impacts on CBAs were therefore not undertaken. The entire project is within an Ecological Support Area (ESA), which extends across vast distances in all areas close to De Aar. There are therefore no options outside of this ESA for the project. All the recently assessed renewable energy projects directly to the east of De Aar are within this ESA.

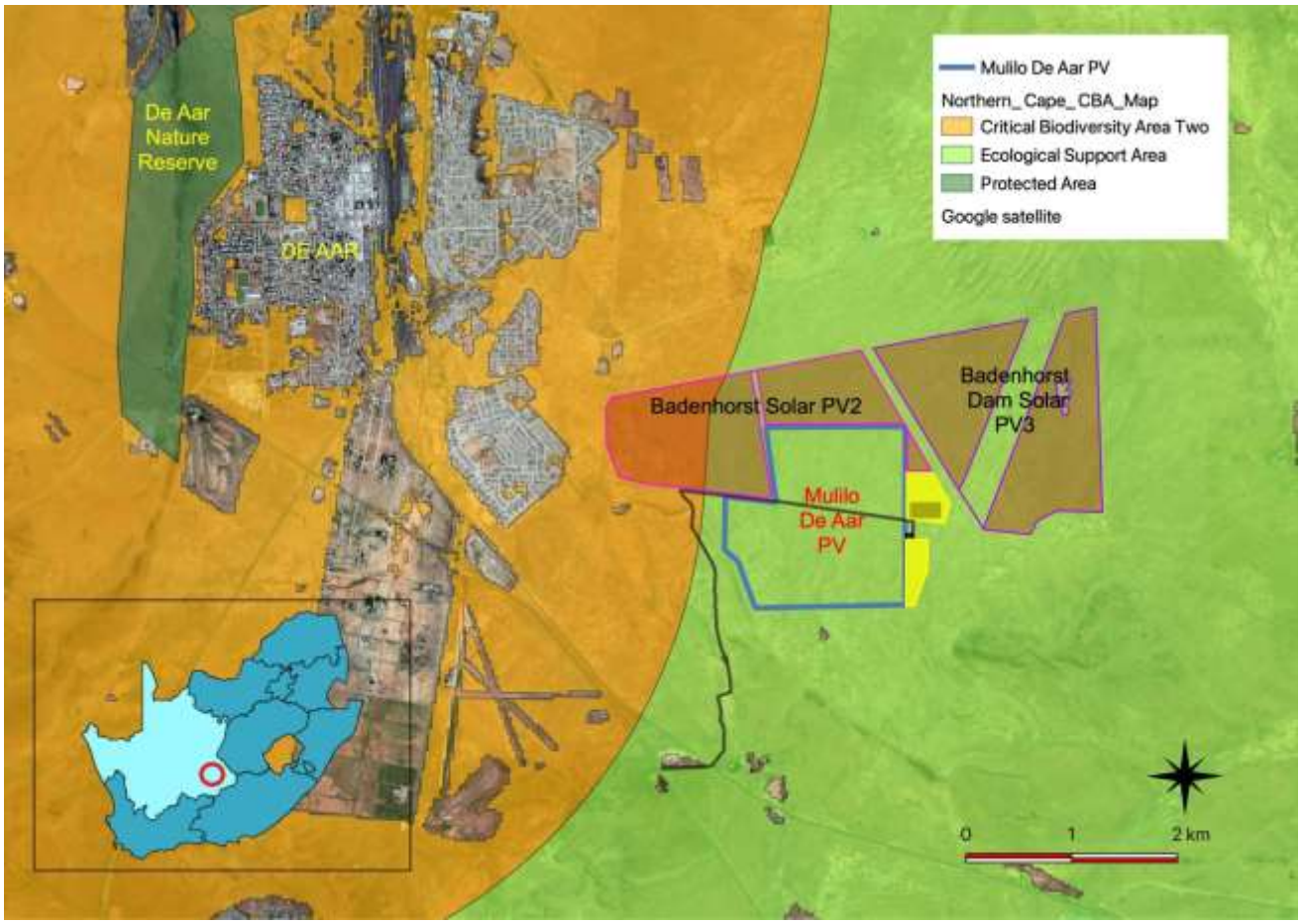


Figure 5: Critical Biodiversity Areas

De Aar Nature Reserve

At the time of the original assessment, the presence of the De Aar Nature Reserve was not considered. The existence of the reserve was unknown at the time of the original assessment in 2011. The Nature Reserve is on the eastern side of De Aar, bordering on the town edge and approximately 6km to the east of the Mulilo De Aar PV SEF. During the recent site visit that was undertaken on 4 March 2022, the possible effect on this nature reserve was specifically considered. The assessment concluded that there will be no direct habitat loss on the reserve due to the proposed project and *the proposed project is not considered to have any significant effect on the nature reserve.*

NEW GUIDELINES THAT ARE NOW RELEVANT

It is now routine to request a Screening Report from DFFE for an Environmental Authorisation as required by the 2014 EIA Regulations. This identifies sensitivities for various Themes that need to be specifically addressed during the environmental assessment process. For an Ecological study, the relevant themes are Animal Theme, Plant Theme, and Terrestrial Biodiversity Theme. Any sensitivities occurring on site must be assessed according to the Species Environmental Assessment Guidelines.

During a walk-through survey for another project (a power line project) in the direct vicinity of the proposed PV site, sensitivities for these themes were specifically addressed, and overlap with those within the Mulilo De Aar Solar PV site. A recent Screening Tool report for the Mulilo De Aar Solar PV site provides an identical output as that for the assessed power line. The power line area was assessed as having Low sensitivity for the Plant Theme and for the Animal Theme, which matches the original assessment for the Mulilo De Aar Solar PV site. Due to the presence of the Ecological Support Area, which affects all projects directly east of De Aar, the sensitivity identified in the Screening Tool report was Very High. A Terrestrial Biodiversity Theme assessment was therefore undertaken for the power line, which assessed Loss of Habitat as having Medium significance. This matches the original (2012) assessment for the Mulilo De Aar Solar PV site, where "Loss or fragmentation of indigenous natural vegetation" was assessed as having Medium significance.

There are therefore no conflicts between the original (2012) assessment of the Mulilo De Aar Solar PV site, recent guidelines, or the recent assessment as mentioned above, for which fieldwork was recently (March 2022) undertaken.

CUMULATIVE IMPACTS

According to the Screening Tool report for the current project (dated 05/07/2022), there are 29 solar energy projects within 30km of the Mulilo De Aar Solar PV project that have been approved.

The vegetation type (Northern Upper Karoo) is widespread and not threatened - it occupies a total area in excess of 28100 km^2. Most of the solar projects listed as occurring within 30km of the current site only affect lowland plains, which is where Northern Upper Karoo is found. Few areas within any other nearby vegetation types are affected, therefore impacts on these other vegetation types are not considered to be relevant for the cumulative assessment being undertaken here. If it is imagined as a scenario that the entire area within 30km of the current site is developed, this would amount to approximately 10% of the entire vegetation type (the area of a circle with radius of 30km = 2827km^2). Loss of this entire area would not affect the conservation status of the vegetation type. The reality is that only a fraction of the entire area within 30km of the current site is affected (<2%), which is insignificant relative to the total area of the vegetation type (<0.2%).

The cumulative assessment was rated as having medium significance on the basis of being a permanent impact that will definitely happen, but the spatial extent, in terms of actual area

affected, is very small. Recommended mitigation measures are adequate for ensuring that this is contained. On this basis the proposed development is supported.

CONCLUSION (FAUNA AND FLORA)

The following conclusions may be made:

1. The baseline status of the environment in terms of the ecological assessment (Animal Theme, Plant Theme, Terrestrial Biodiversity Theme) has not changed since the initial EIA was done in 2012.
2. The initial impact rating undertaken during the initial assessment is still valid.
3. The mitigation measures provided in the initial assessment are still applicable. There are no new mitigation measures that should be added to the Environmental Authorisation.
4. No changes to the environment have occurred since the initial EA was issued.
5. It is confirmed that the MTHS Layout, as approved last year (in 2021), is still applicable.

In conclusion, the environment in terms of fauna and flora has not changed significantly since 2012; therefore, there is no objection to the extension of the validity of the Environmental Authorisation.

4.4 Avifauna Specialist Input

An Avifauna Specialist Input Letter was compiled by Arcus Consultancy Services SA (Pty) Ltd, represented by Dr Owen Davies (attached under Appendix C and is summarised below.

BASELINE ENVIRONMENT VS CURRENT ENVIRONMENT

Three previous avifaunal studies that included the area under consideration were included in the preparation of this letter, namely Harebottle (2012), Avisense (2014) and Arcus (2021). Harebottle (2012) noted that no solar energy guidelines for birds was available at the time of the study and adapted the birds and wind energy guidelines at the time to suit the study. It was indicated that monitoring should take place once per quarter for a period of up to 12 months prior to construction and 12 months after construction (operation phase). Three avifaunal monitoring surveys were subsequently conducted that included the end of autumn, winter and summer 2013/2014 and included the period of peak avifaunal abundance.

Avisense (2014) established a suitable baseline of the avifaunal community in the receiving environment to appropriately inform the impact assessment. However, the study included several transects within the development footprint and while this is valuable, recommended (and often necessary) practice employed to assess the potential impacts of the development, it precludes repeated sampling of those transects during the construction and operational phases. This therefore reduced the opportunity to measure the scale of impacts that may be associated with those phases (such as disturbance effects). Arcus (2021) recommended that additional pre-construction monitoring should be conducted to update the avifaunal baseline of the receiving environment to facilitate the measurement of any construction and post-construction impacts

(e.g. through before-after-control-impact analyses). A site visit was subsequently conducted in August/September 2021, during which the latest applicable protocols and guidelines were applied. Fifteen walk-transects were conducted which approximately aligned with the survey effort conducted by Avisense (2014).

The avifaunal community observed and recorded during the recent monitoring conducted by Arcus (2021) was comparable to the observations made by the previous studies and comprised of relatively low diversity and abundance of smaller passerine birds compared to the overall diversity of the broader region. This is due to the relatively low level of habitat diversity across the site, comprising largely of flat, lowland scrub. The current status of the environment under consideration is therefore considered to be practically unchanged from an avifaunal perspective since the original Environmental Impact Assessment was conducted.

CUMULATIVE IMPACT

The surrounding area has been the focus of interest for various developments for a relatively long period of time, with the initial assessment considering the cumulative impacts of multiple renewable energy facilities within 30km of the proposed site, including wind energy and solar energy facilities. The Screening Tool currently lists 27 approved solar energy facilities within 30km.

Several impacts with significance to avifauna are already present in and around the development site, including operational solar PV facilities and overhead power lines that converge on the nearby existing Hydra Main Transmission Substation. The primary impacts associated with solar PV facilities are considered to include habitat destruction, disturbance and displacement and direct mortality through collisions with solar arrays or associated infrastructure such as overhead transmission lines. The relatively low avifaunal abundance and diversity recorded across the site makes it unlikely that the development will contribute significantly to the cumulative negative impact of habitat destruction to the avifaunal community of the receiving environment. The surrounding area is largely contiguous natural habitat that is more favourable to avifaunal species of conservation concern than the development site given the site's proximity to De Aar and the existing network of overhead power lines.

Harebottle (2012) notes that "*[a]lthough disturbance and displacement of localised endemic/range-restricted species are likely to occur during construction and operational phases of the development, the construction of above-ground transmission cables pose a higher risk to the area's avifauna*". Indeed, overhead power lines present a risk of collision for species such as Ludwig's Bustard, Blue Crane, Black Harrier, Kori Bustard, Secretarybird and many other large-bodied species. However, the development is unlikely to have a significant contribution to the negative impact that already exists across the site given the large number of overhead power lines present.

Overall, it is considered unlikely that the development will contribute significantly to the cumulative impact in the area on avifauna beyond acceptable levels in the context of existing

current impacts and can proceed from an avifaunal perspective. The site appears to be well suited for the development of a solar PV facility.

CONCLUSION (AVIFAUNA)

The MTHS Layout as approved in 2012 is still applicable, the impact assessment undertaken during the initial assessment remains valid and the mitigation measures provided therein are also still applicable.

Additional requirements of the updated guidelines for pre-construction avifaunal monitoring have been addressed by recent studies in the area (Arcus 2021) and additional requirements for the construction and operational phases of avifaunal monitoring can be appropriately implemented during the relevant periods should the competent authority extend the validity of the Environmental Authorisation.

In conclusion, sufficient baseline data of the avifaunal community in the receiving environment exists through the pre-construction monitoring that was conducted by Avisense (2014) over three seasons (including the period of peak avifaunal abundance), as well as the site visit conducted by Arcus in August/September 2021, to inform the assessment and measure potential future impacts that may occur.

The environment in terms of the avifaunal community has not changed significantly since 2012; therefore, there is **no objection** to the extension of the validity of the Environmental Authorisation from an avifaunal perspective.

4.5 Aquatic Biodiversity Impact Assessment Comment

An Aquatic Biodiversity Impact Assessment Comment was undertaken by Blue Science (Pty) Ltd, represented by Ms Toni Belcher and is attached under Appendix C. A summary thereof follows below.

SUMMARY OF FINDINGS OF FRESHWATER ASSESSMENT FOR THE PROJECT, DATED MAY 2012

The freshwater features consist largely of ephemeral tributaries of the Brak River. These tributaries are considered to be in a moderately modified ecological state, with a low ecological importance and sensitivity. The expected impacts of the proposed activities are likely to be as follows:

- Solar energy facility: The proposed site is outside of all identified freshwater features/drainage lines; therefore potential impact on freshwater features is very low for this component.
- Laydown areas: The proposed areas are outside of any identified freshwater features/drainage lines; therefore, the potential impact on freshwater features is very low for this component.

- Overhead transmission lines/corridors: The preferred transmission lines/corridors do not appear to cross any freshwater features/drainage lines; therefore, the potential impact on freshwater features is very low for this component.
- Substations: None of the substations is placed in or near any freshwater features/drainage lines; therefore, the potential impact on freshwater features is very low for this component.
- Access routes and water pipeline: The proposed access route and water pipeline cross the lower reach of the Sandsloot Tributary; however, it is below the larger instream dam and just upstream of the Nonzwakazi township, where there is no discernible river/drainage channel. The potential impact on freshwater features for this component is expected to be low to very low.

Mitigation measures that should be implemented were recommended and it was determined that, after the implementation of these measures, the overall significance of the potential impact of the preferred option is expected to be very low.

Following the initial assessment of the site, the additions listed below were added to the project layout:

- In 2020, a BESS was proposed to be located at the southern extent of the original study area for the PV facilities that were assessed; and
- In 2021, a Genset was proposed to be housed in above-ground shipping containers in either the previously authorised laydown area (Badenhorst Dam Solar PV3) or the authorised Mulilo PV site.

Both these areas were ground-truthed and confirmed that no visible aquatic features occurred within or adjacent to these areas such that they would alter the initial aquatic ecosystem assessment findings or require additional mitigation measures. The closest aquatic feature is a minor ephemeral drainage feature more than 200m to the south of the site. Drainage from the site is northwards and away from this ephemeral watercourse. Recommended mitigation measures highlighted measures that were given in the original aquatic assessment.

Water Use License / General Authorisation

The Department of Water and Sanitation (DWS) has provided acknowledgement that the project falls within the ambit of the General Authorisations for Section 21 (a) water use (Government Notice 538 of 2016); for Section 21 (c) and (i) water use activities (Government Notice 509 of 2016) as well as for Section 21(g) water use activities (Government Notice 665 of 2013). The various water use activities associated with the project have been registered with the DWS.

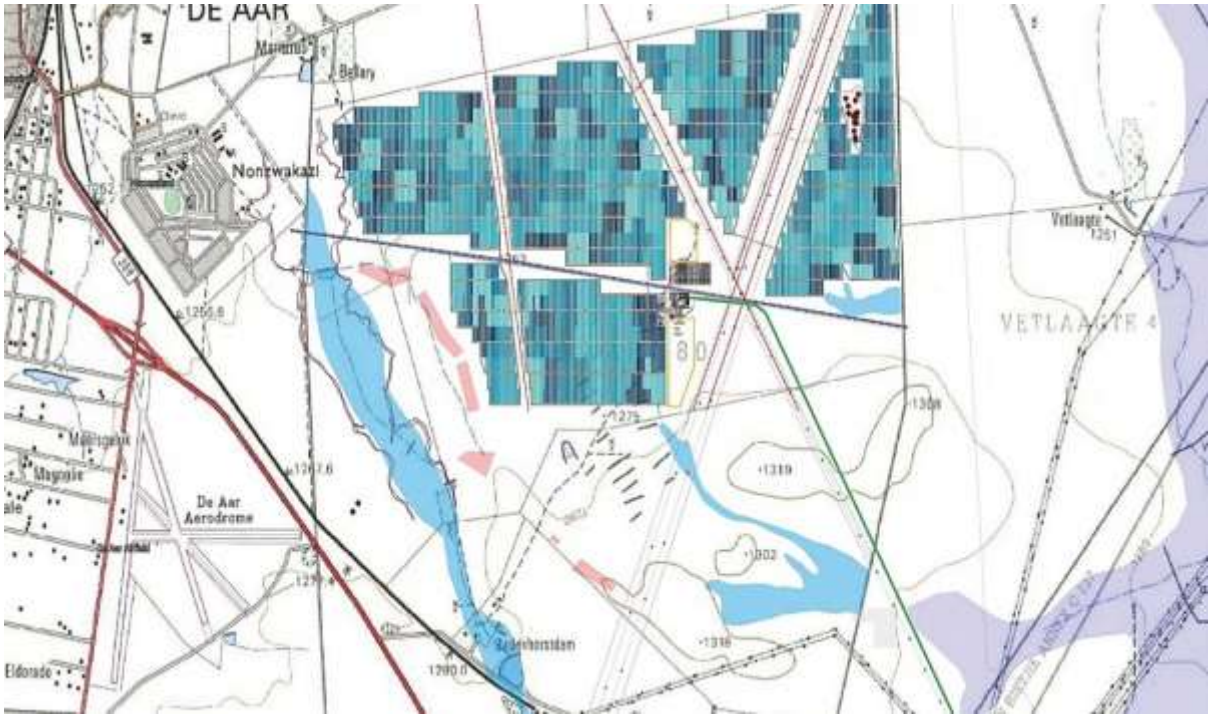


Figure 6: Topographic map showing the location and the associated aquatic features

COMMENT ON ANY CHANGES TO THE AQUATIC ECOSYSTEMS WITHIN THE SITE

The site was visited in January 2012 during the first EIA process and again in May 2013. The following findings were recorded:

- The main aquatic feature within the study area is the Brak River, a seasonal tributary within the Orange River System.
- The river flows along the northern boundary of the study area, with a number of its tributaries crossing the site as they flow in a northerly direction.
- The most notable of the tributaries is the Sandsloot River which originates near the Badenhorst Dam Farm, and flows through the town of De Aar.
- Most of the other, smaller tributaries within the study area are ephemeral and are discernible only as slightly shallow depressions with no clear associated vegetation and slightly clayey soils.
- Small, shallow instream dams have been constructed within the drainage channel, which flows through the site.
- The ephemeral streams within the site were deemed to be moderately modified and of a low Ecological Importance and Sensitivity.

A field visit was undertaken in March 2022 for a different project in the direct vicinity to the proposed PV site to determine whether there was any significant change to the aquatic features. The Screening Tool and the maps below were used in determining if any changes to the environment were evident.

Screening Tool

In terms of the more recent DFFE Aquatic Biodiversity Combined Sensitivity mapping for the area, the wider area in which the site is located is considered of very high Aquatic Biodiversity Combined Sensitivity. This is due to the fact that the area is considered a Strategic Water Source Area for groundwater (De Aar Region).

Freshwater Ecosystem Priority Areas (FEPA)

The sub-catchment of the tributaries of the Brak River in which the project is located is mapped as an Upstream Management Area. Upstream Management Areas are sub-catchments in which human activities need to be managed to prevent the degradation downstream. There are two FEPA Wetlands mapped to the south of the project footprint. These features were determined during the field assessment as off-channel farm dams that are not considered of any aquatic biodiversity conservation significance. Some natural valley bottom and riverine wetland habitats have been mapped further to the north and east of the proposed project that is associated with the Brak River Tributary. The wetlands are located some distance from the proposed activities and are unlikely to be impacted by the project activities.

Flood Line

The project footprint has specifically been moved back from the flood lines of the adjacent watercourse that drains to the west of the site to the Sandsloot River, which is a tributary of the Brak River.

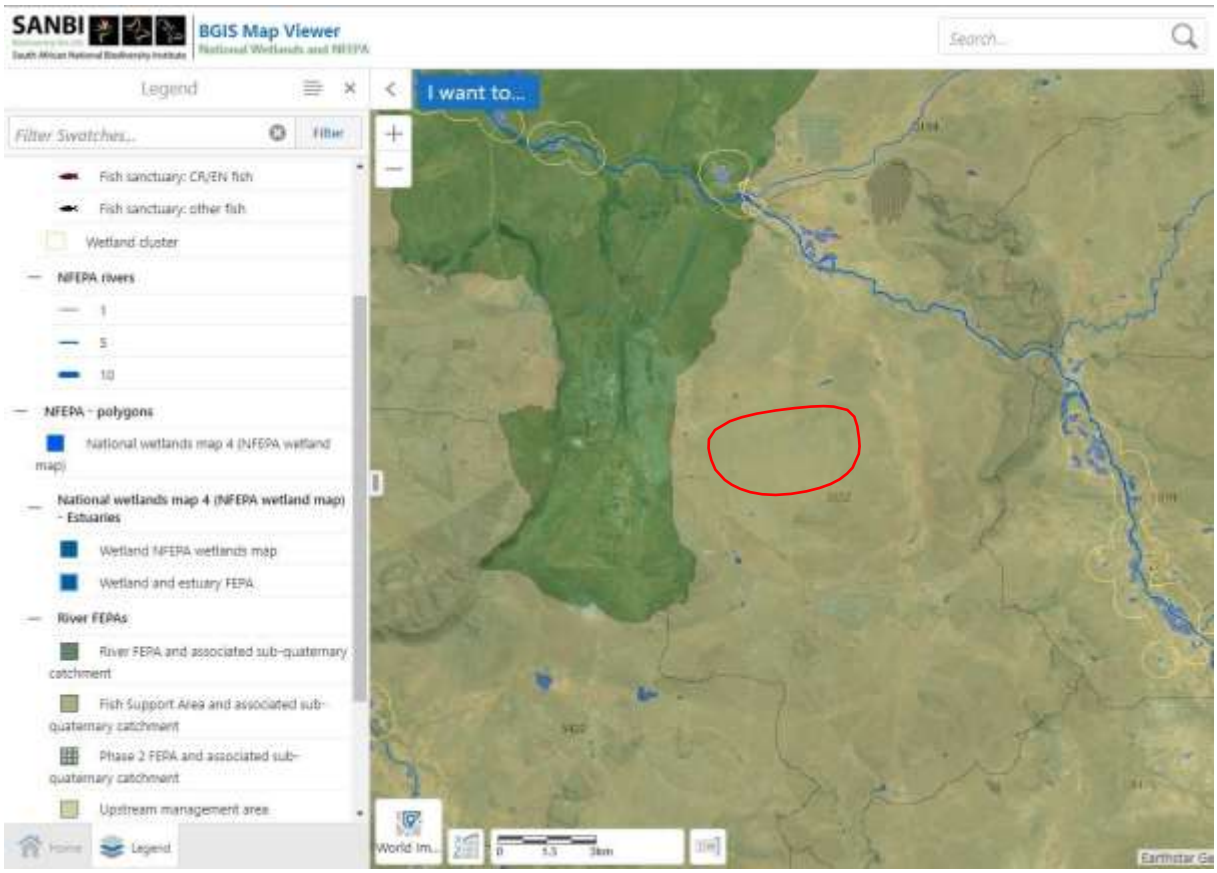


Figure 7: Freshwater Ecosystem Priority Areas for the site and the wider surrounding area

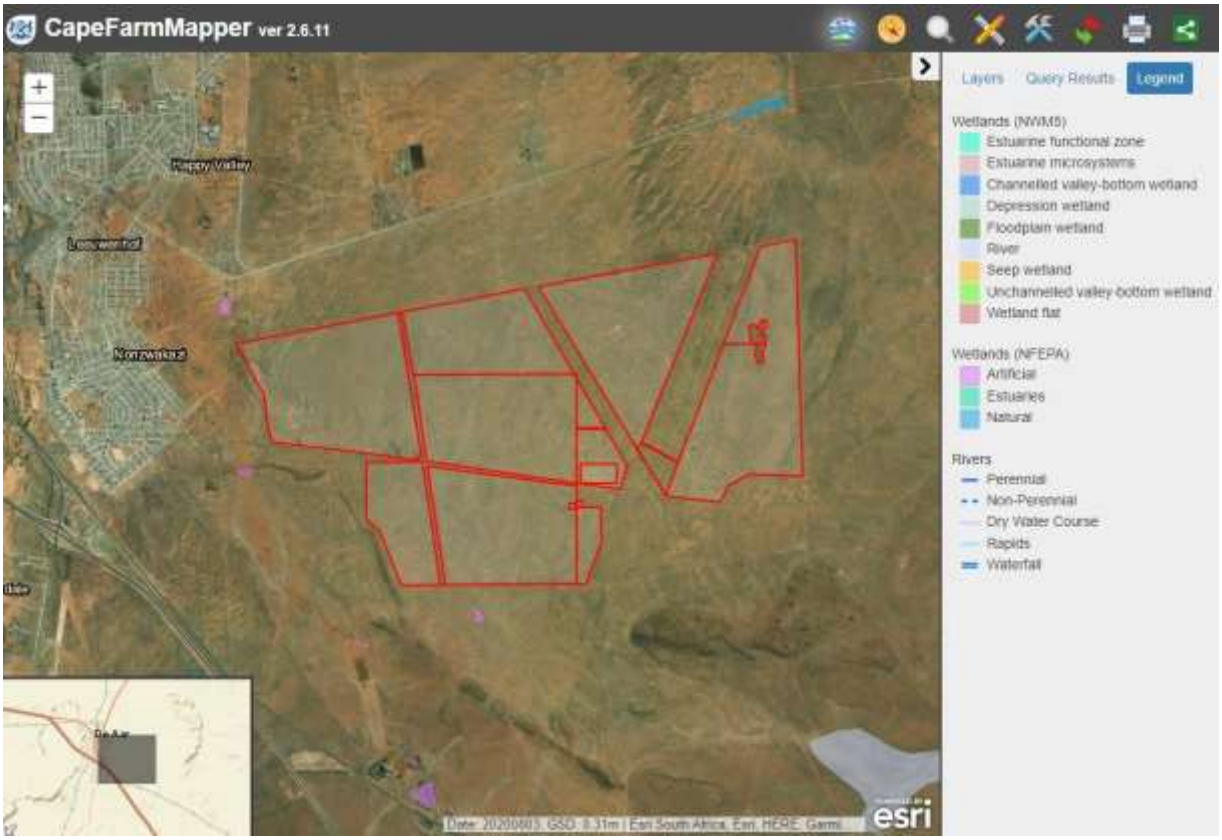


Figure 8: NFEPA Wetland and National Wetland Map 5 mapping for the project area

The land use at the site has not changed significantly since the 2012 assessment and is only utilised for some livestock grazing. *The ecological integrity of the rivers and wetland habitats adjacent to the site appears to be essentially unchanged from the 2012/3 assessment.*

GENERAL COMMENT ON THE CHANGE TO IMPACT SIGNIFICANCE

Given the fact that the approved Mulilo De Aar PV site is located outside of the mapped aquatic features and no changes are proposed, *the assessed impact ratings (Low to very low with mitigation) are not likely to alter*.

GENERAL COMMENT ON ADDITIONAL MITIGATION MEASURES

The mitigation measures stated in the freshwater impact study dated May 2013 remain the same, with *no additional mitigation measures being required*.

SUMMARY, DESCRIPTION AND ASSESSMENT OF ANY CHANGES TO THE AQUATIC ECOSYSTEMS

There are no changes to the extent, condition or ecological importance and sensitivity of the aquatic ecosystems at the site. According to more recent visits to the immediate area, *the status quo of the aquatic features remains as was assessed in the 2012/2013 assessments that informed the approval of the Mulilo De Aar PV project*.

AQUATIC ECOSYSTEM SENSITIVITY IN RELATION TO THE PROJECT LAYOUT

The image below shows the project footprint in relation to the watercourse corridors and the 1 in 100 flood lines of the larger water course near the site. These watercourses were determined to be in a moderately modified ecological state, with a low ecological importance and sensitivity. *The project has been placed outside of the watercourse corridors mapped at the site.*

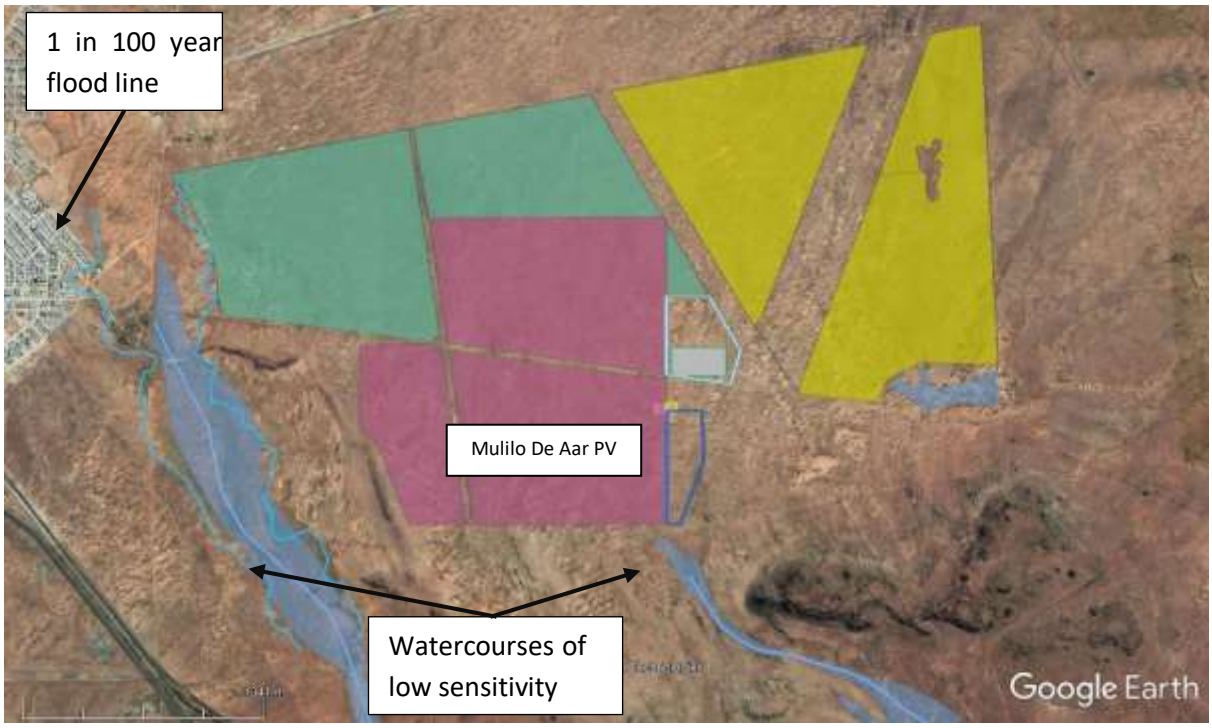


Figure 9: Watercourse and the 1 in 100-year flood lines in relation to the project footprint

SPECIALIST COMMENT ON THE CUMULATIVE IMPACT ON THE AQUATIC ECOSYSTEMS

The cumulative impact of the project activities, together with other renewable energy projects and the existing activities in the area, could have the potential to reduce the integrity of the watercourses if not properly mitigated and managed. By implementing suitable buffers (30m for the smaller watercourses at the site) along the watercourses and minimising the works within the river/stream corridors, the impact of the proposed project activities would be low and unlikely to impact the integrity of the aquatic ecosystems. The mitigation measures provided for the approved project are thus deemed to be sufficient to prevent cumulative impacts resulting from the construction and operation of this project.

RECOMMENDATION

This assessment of the status quo of the aquatic ecosystems within the Mulilo De Aar PV project site thus confirms that there has not been any significant change to any of the impacts or impact ratings identified in the freshwater impact assessment dated January 2012 and updated in May 2013. *There is thus no objection to the extension of the validity of the Environmental Authorisation.*

4.6 Agricultural Specialist Statement

An Agricultural Specialist Statement was compiled by Johann Lanz, Soil Scientist, and attached under Appendix C. A summary thereof follows below.

The purpose of the agricultural component in the Environmental Authorisation process is to preserve the agricultural production potential of, particularly scarce arable land, by ensuring that development does not exclude existing or potential agricultural production from such land or impact it to the extent that its future production potential is reduced. *This project, however, poses almost zero threat to agricultural production potential because of the very limited agricultural production potential of the site*.

ORIGINAL ASSESSMENT CONDUCTED IN 2012

The Agricultural Impact Assessment completed in 2012 rated the significance of the agricultural impact as very low. This was because the site was found to have a low agricultural value due to an arid climate and highly restrictive soil characteristics.

CURRENT AGRICULTURAL STATUS

The current status of the site remains exactly as it was in the original assessment. Agricultural production potential is a function of climate, terrain and soils and cannot change significantly in the time period since the original assessment, or even in a much longer time period.

CUMULATIVE IMPACT

The most important concept related to a cumulative impact is that of an acceptable level of change to an environment. A cumulative impact only becomes relevant when the impact of the proposed development will lead directly to the sum of impacts of all developments causing an acceptable level of change to be exceeded in the surrounding area. If the impact of the development being assessed does not cause that level to be exceeded, then the cumulative impact associated with that development is not significant.

The potential cumulative agricultural impact of importance is a regional loss (including by degradation) of future agricultural production potential. The defining question for assessing the cumulative agricultural impact is this:

> What loss of future agricultural production potential is acceptable in the area, and will the loss associated with the proposed development, when considered in the context of all past, present or reasonably foreseeable future impacts, cause that level in the area to be exceeded?

There are 29 other renewable energy project applications within 30km of the proposed site, according to the Screening Tool Report.

All of these projects have the same agricultural impacts in an almost identical agricultural environment, and therefore the same mitigation measures apply to all.

In quantifying the cumulative impact, the area of land taken out of grazing as a result of all 29 developments (total generation capacity of 1,703 MW) will amount to a total of approximately 4,258 hectares. This is calculated using the industry standards of 2.5 and 0.3 hectares per megawatt for solar and wind energy generation respectively, as per the Department of Environmental Affairs (DEA) Phase 1 Wind and Solar Strategic Environmental Assessment (SEA) (2015). As a proportion of the total area within a 30km radius (approximately 282,700 ha), this amounts to 1.51% of the surface area. That is within an acceptable limit in terms of loss of low potential agricultural land which is only suitable for grazing, of which there is no scarcity in the country.

In order for South Africa to develop the renewable energy generation that it urgently needs, agriculturally zoned land will need to be used for renewable energy generation. It is far more preferable to incur a cumulative loss of agricultural land in a region such as the one being assessed, which has no crop production potential, and low grazing capacity, than to lose agricultural land that has a higher potential, and that is much scarcer, to renewable energy development elsewhere in the country. The limits of acceptable agricultural land loss are far higher in this region than in regions with higher agricultural potential.

It should also be noted that there are few land uses, other than renewable energy, that are competing for agricultural land use in this area. The cumulative impact from developments, other than renewable energy, is therefore likely to be very low.

Due to all of the considerations discussed above, the cumulative impact of loss of future agricultural production potential will not have an unacceptable negative impact on the agricultural production capability of the area. The proposed development is therefore acceptable in terms of cumulative impact, and it is therefore recommended that it is approved.

CONCLUSIONS (AGRICULTURE)

This specialist statement concludes the following:

1. The baseline status of the environment in terms of agricultural impact has not changed since the initial EIA was done in 2012.
2. The initial impact rating undertaken during the initial assessment is still valid.
3. The mitigation measures provided in the initial assessment are still applicable.
4. There are no new mitigation measures that should be added to the Environmental Authorisation if the DFFE decides to extent the commencement period as per the application.
5. The MTHS Layout as approved in 2012 is still applicable.

Final recommendation: The environment in terms of agricultural impact has not changed significantly since 2012; therefore, there is no objection to the extension of the validity of the Environmental Authorisation.

4.7 Heritage/Cultural Environment and Palaeontology

A Heritage Input Statement Letter was compiled by Asha Consulting, represented by Mr Jayson Orton (attached under Appendix C) and is summarised below.

DESKTOP STUDY AND BASELINE ENVIRONMENT OF ORIGINAL ASSESSMENT

The survey focused on landscape features through the open grasslands. With one local exception, the open grasslands typically contain minimal to no heritage resources. What follows is a desktop review of heritage resources in and around the study area. The focus is strongly on archaeology and palaeontology, since no other types of heritage will be affected by construction of the facility.

Archaeology

The original survey revealed that the distribution of archaeological resources was strongly associated with dolerite outcrops. These outcrops occurred in two areas: one is a long dyke extending from northwest to southeast and passing by the south-western edge of the authorised facility, while the other is a low rise located well to the northeast of the facility. The only archaeological materials seen on the flat, intervening featureless plains were occasional isolated background scatter artefacts that were generally weathered and can be attributed to the MSA. These are thus the only archaeological materials that might possibly be impacted during construction of the proposed facility. *Such materials are of very low to no cultural significance and require no further action*.

Other surveys in the immediate area have confirmed this pattern. Local examples of MSA low density scatters have been recorded by Kaplan (2010b), Morris (2011), Fourie (2011), Kruger (2012) and Orton (2012, 2022b, 2022c). Although denser scatters of such artefacts occur in the same general area (Orton 2022b, 2022c), *none of them are worthy of any mitigation*.

The most important sites in the surrounding area are a historical farmstead located 3.45km north of the proposed project (Orton 2012) and a Later Stone Age site located 4.3km north-northwest of the proposed project (Orton & Webley 2013). This latter has recently been excavated and found to be a dense accumulation of LSA occupation debris (Orton 2022a).

Very little change to the archaeological environment is expected to have occurred. This is because of the small amount of development that has occurred in the surrounding area. No significant heritage resources have been destroyed by construction of any other renewable energy facilities or other development in the De Aar area since the original assessment. No significant natural changes to the archaeological landscape are expected to have occurred since the original impact assessment with the only possible changes relating to the shifting of individual artefacts through the action of water runoff or flooding. The general environment is a very slowly deflating and/or eroding environment rather than an accretionary one, and thus if the Mulilo De Aar PV site were resurveyed today no difference in results would be expected.

The significance of the impacts to archaeology can thus be considered to be **very low negative**. The original rating after mitigation was very low negative and the mitigation was applied. This involved ensuring that dolerite landscape features were avoided.

Palaeontology

The palaeontological sensitivity of the proposed PV footprint and surrounds is generally rated as high. The Ecca and Beaufort Group sediments, both of which pertain to the Late Palaeozoic Karoo Supergroup, are considered to be potentially fossiliferous. However, a field survey of the site has demonstrated that the surface is almost entirely mantled by thick superficial deposits of probable Pleistocene to Recent age. These comprise of soil, gravel and/or calcrete hardpan, all of which buries the potentially fossiliferous bedrocks. The upper Ecca Group bedrocks in the De Aar area are known to contain locally abundant fossil wood and low diversity trace fossil assemblages considered typical of the Waterford Formation, rather than the Tierberg Formation as mapped. The fossil wood is of general palaeontological research interest for dating and palaeo environmental studies.

No fossils were observed within the Lower Beaufort Group rocks that are only exposed just beyond the southern edge of the proposed footprint, although trace fossils, silicified wood and rare vertebrate remains (therapsids) of the formally recognised Middle Permian *Pristerognathus* Assemblage Zone (AZ) have recently been recorded from this succession in the De Aar area).

The superficial deposits (soils, gravels, alluvium, calcrete) are generally of *low palaeontological sensitivity*. Relevant observations from these deposits include calcretized rhizoliths (root casts) of probable Quaternary age as well as reworked fossil wood material of Ecca provenance which likely occurs widely within the local gravels.

Almond (2012a:1-2) concluded that:

- "The potentially fossiliferous Karoo Supergroup rocks within the development footprints (solar panel arrays, transmission lines, roads and other infrastructure) are generally buried beneath a thick mantle of fossil-poor superficial sediments (soils, gravels, calcretes);
- The Karoo Supergroup rocks are extensively disrupted by near-surface secondary calcrete formation. In many cases they have suffered baking during dolerite magma intrusion, further compromising their fossil heritage;
- The solar energy facilities each have a small footprint while extensive, deep bedrock excavations are not envisaged for this sort of alternative energy development."

Very little change to the palaeontological environment is expected to have occurred since the original assessment and field survey. This is because significant impacts to fossils are not expected to have occurred through development of renewable energy facilities or any other developments in the surrounding area. Natural processes of weathering and erosion are unlikely to have exposed or destroyed fossils preserved at or near the ground surface over a time span of a few years. The most common fossils found on the De Aar landscape (fossil wood, rhizoliths, trace fossils) are of generally low palaeontological significance and their loss is of little to no

consequence after they are recorded during impact assessment surveys. Furthermore, the most important fossils would be deeply buried within bedrock, beneath the generally unconsolidated to weakly consolidated surface sediments. *As such, any new survey of the Mulilo De Aar PV site will not produce any different or new results*.

The significance of the impacts to palaeontology can thus be considered to be **low negative**. The original significance rating was low negative and no mitigation measures were proposed.

Graves

No graves were recorded during the original survey. The chances of graves being present are extremely low because of the nature of the substrate (thin soil overlying rock), but not zero. Nevertheless, the locations of unmarked precolonial graves cannot be predicted and thus they cannot be meaningfully assessed. They can only be dealt with at the time of accidental discovery should this happen. *This aspect of heritage thus requires no further consideration*.

With the exception of farm graveyards associated with farmsteads, other surveys in the area have also failed to reveal graves within renewable energy development sites.

Built heritage

There are no built heritage resources in close proximity of the study area and no structures of any sort within the broader PV area. The nearest are farmsteads lying 1.5 km to the south and 1.8 km to the north of the proposed footprint. Buildings are always avoided by renewable energy developments and thus this aspect of heritage requires no further attention.

Cultural landscape

The Karoo landscape is well-known for its wide open spaces, flat grassland plains, dolerite dykes and flat-topped hills. It is predominantly a natural landscape and, while many areas are remote and relatively untouched by development other than low intensity farming (livestock grazing), the vicinity of De Aar is quite strongly dominated by electrical infrastructure. Several wind and solar facilities are present in the surrounding landscape and high voltage power lines are abundant. Part of the reason for these developments is the very large Hydra Substation which lies to the southeast of De Aar, and 3.5 km southeast of the proposed PV footprint. These facilities have effectively added a modern electrical 'layer' to the cultural landscape and, visually, this infrastructure is fairly dominant in the foreground and middle ground. *Given the existing projects in the area, there will not be any new impacts to the cultural landscape*. Although the intensity of impacts would increase marginally, this change would be too small to affect the significance since the landscape is already strongly electrical.

The significance of the impacts to the landscape can thus be considered to be *very low negative*. The original assessment also rated these impacts as *very low negative*. Mitigation measures related to avoiding landscape features such as rocky outcrops and ridges, minimising land clearance and staying within the authorised footprint have been complied with, while the other are still applicable and are included in the existing EMPr.

CURRENT ENVIRONMENTAL BASELINE

Recent aerial photography and site visits for adjoining projects show that no alteration of the environment has taken place. The site was undeveloped grazing land in 2012 and remains that way today. The kind of change that is relevant to heritage is, for example, if the site has been ploughed which would result in the soil and any surface archaeology and or palaeontology being turned over and mixed. No such change is evident and there is no reason to believe that the heritage resources – both on and beneath the ground – would have changed in the last ten years. *The current baseline environment is thus considered to be identical in archaeological and palaeontological terms to that assessed in 2012*. With the extra electrical developments that have occurred in the intervening years the landscape is considered to be of lesser cultural significance than what it was in 2012. Electrical infrastructure is the dominant anthropogenic signature in the area.

FURTHER REQUIREMENTS AND NEW GUIDELINES

Given that there has been no change in the baseline environment on the site, no new field assessment is required.

The current minimum reporting standards were published by SAHRA in 2007 and remain applicable today.

CUMULATIVE IMPACTS

It has already been noted that impacts to built environment and graves will not occur. Impacts to archaeology, palaeontology and the cultural landscape will occur but all are of low significance. Cumulative impacts to these aspects of heritage would therefore also occur, but, again, they are of low significance. Based on the desktop study above, these are explored individually below.

Archaeology

The only archaeological materials expected to be impacted are rare, isolated background scatter artefacts which have very low to zero cultural significance and are not worthy of any sort of mitigation. The loss of these artefacts would mean that fewer of them would occur on the landscape but their very low cultural significance means that the cumulative impact is of no consequence and does not need any further consideration. The cumulative impact cannot be quantified because such materials occur widely in the Karoo, well beyond the 30km limit considered here, and in variable densities.

The significance of the cumulative impacts to archaeology can thus be considered to be *very low negative.*

Palaeontology

The only fossil materials expected to be impacted are *ex situ* fossil wood fragments contained within the surface gravels (where these occur), as well as rhizoliths in calcretised areas. These materials are commonly encountered in the area and have generally low cultural significance with impacts to them consequently being of low significance. The loss of such fossils will not

significantly affect the fossil heritage of the region because of the limited research potential of these materials and the fact that they are so common. As such, even with similar fossils lost in other nearby developments, the cumulative impact is of no further concern. The cumulative impact cannot be quantified because such fossils occur widely in the Karoo, well beyond the 30km limit considered here.

The significance of the cumulative impacts to palaeontology can thus be considered to be **low negative**.

Cultural landscape

The cultural landscape is already dominated by its modern electrical 'layer'. As such, any further electrical development, such as the PV facility under consideration here, will be adding to an existing layer. New impacts to the landscape will not occur, but the existing impact would be slightly extended. The original report noted that the construction of multiple PV facilities in the area would detract from the visual qualities of the landscape. However, given the establishment of the De Aar area as an electricity producing hub, the intensity of cumulative impacts to the landscape becomes less and less of an issue. Importantly, landscape features such as dolerite hills and ridges are avoided by the project which means that rehabilitation of the site at the end of its lifespan will be relatively straightforward. It is not possible to quantify impacts to the cultural landscape since they would appear different from any one of countless vantage points along the various local roads.

The significance of the cumulative impacts can thus be considered to be **very low negative**.

CONCLUSION

Based on the above review the following conclusions can be drawn:

1. The baseline environment for archaeology and palaeontology has not changed since 2012;
2. The baseline environment for the cultural landscape is of lesser quality than it was in 2012;
3. The impact assessment ratings provided in 2012 remain valid today;
4. Some mitigation measures have been complied with (i.e. areas to be avoided have been avoided through layout design), while others remain applicable and have been included in the project EMPr;
5. No new mitigation measures are required; and
6. The existing MTHS project layout as approved is sensitive to heritage resources in that all known significant heritage sites have been avoided. The layout is therefore still appropriate in heritage terms.

Reasoned opinion

Based on the reviews of individual and cumulative impacts above, it is the opinion of the heritage specialist that the proposed Mulilo De Aar PV facility should be allowed to proceed and that the amended EA should be issued.

4.8 Visual Statement

A Visual Statement was compiled by VRM Africa, represented by Mr Steve Stead (attached under Appendix C) and is summarised below.

Further to the original VIA dated 2011, a Basic VIA, inclusive of a site visit, was undertaken for the directly adjacent Badenhorst Dam PV2 and Badenhorst Dam PV3 BESS projects in 2020. This visual statement draws from the combined reports.

Table 6: Visual statement

Policy Fit	**Positive High**
In terms of the spatial planning defined for the area, the proposed project has a good policy fit. The project will contribute to economic growth and diversification, social development projects, economic development in the region, sustainable development and affordable energy without detracting from significant natural or cultural landscapes. The project has a good policy fit in terms of landscape planning as the area has been identified as a renewable energy development area.	
Zone of Visual Influence	**No change**
The visible extent, or viewshed, is "the outer boundary defining a view catchment area, usually along crests and ridgelines" (Oberholzer, 2005). *No change to the PV panel heights has been made and as such, the viewshed would remain the same*.	
Receptors and Key Observation Points	**No change**
Key Observation Points (KOPs) are the people (receptors) located in strategic locations surrounding the property that make consistent use of the views associated with the site where the landscape modifications are proposed. As the ZVI remains the same, no change to the receptors and Key Observation Points (identified in the original assessment) is expected. *No new receptors were identified*.	
Scenic quality	**No change**
The Terms of Reference for the Visual Statement do not include an impact assessment of the Scenic Quality. However, as the degree of change to the PV panels placement is approximately the same, no change in impact to the Scenic Quality is expected. *No changes to the Scenic Quality were identified in the more recent BESS survey (adjacent to the site), or from the desktop mapping*.	

Receptor sensitivity to landscape change	No change
As stated above, the PV panels will essentially appear in the same locality without any increase in visual prominence. With mitigation and placement of PV panels on flatter terrain, visual scarring would be minimal with effective rehabilitation and restoration. *No new receptors were identified*.	
Expected impact significance	**Medium**
No change to the original impact statement "the study concluded that the overall visual impact of the proposed developments would be moderate, due to the scale of the development, the numbers and types of receptors directly affected, and the shielding by built form. A number of mitigation measures was proposed which could moderate that visual impact"	
Cumulative effect	**Medium**
No change to the original impact statement "the local landscape character is changed; the cumulative impact is assessed as medium for both magnitude and significance". *Discussion of cumulative impact* A key cumulative effect is intervisibility of multiple PV projects, creating a massing effect. The factor influencing intervisibility is distance and terrain. The proposed PV site is well set back from the town, as well as other proposed PV areas to the north and west. The terrain is flat with no prominent features within the development footprint. As a result of the flat terrain, and the distance between the other proposed PV project, the collective Badenhorst PV complex is unlikely to result in dominating intervisibility effects. The 2012 report concludes that while intervisibility will take place, the resultant cumulative effect is likely to be Medium, stating "in a very populated area, with complex landscape patterns, the number of proposed developments could result in a high visual impact. In this context, the long views, exposed sites, roads with little traffic, small to medium sized towns, all combine to rate this cumulative impact as medium". These findings were confirmed during later site visits to the area. The flat terrain and the low prominence of the site, as well as the lower visual exposure to urban receptors, assist to reduce the intensity of the visual intrusion, and thus the intervisibility as well.	

Screening Tool

The visual sensitivity rating in the Screening Tool is Medium. However, due to the flat terrain, the lack of unique landscape resources and the built nature of De Aar, the expected sensitivity to landscape change is rated Medium to Low.

VISUAL IMPACT STATEMENT

The 2011 VIA concluded that:

- "The overall visual impact of the proposed developments would be moderate, due to the scale of the development, the numbers and types of receptors directly affected, and the shielding by built form. It was noted that the semi-industrial nature of a PVF was not incompatible with the industrial uses locally and the transmission lines. A number of mitigation measures were proposed which could moderate that visual impact".
- "The solar arrays will be close to De Aar, but the scale of the landscape is sufficient to provide a setting for these developments as they are widely spaced, and the area is already partly industrialised".

The findings of this visual statement, based on the review of the 2011 VIA report, as well as a VIA undertaken to adjacent projects, is that the 2011 findings are still valid, and that Visual Impacts are likely to be Moderate. An independent review of the 2011 report found that the proposed development site is Class IV, suitable for PV development that could result in some visual intrusion, without significantly degrading the medium to low visual resources of the local landscape.

The environment has not changed significantly since 2012; therefore, there is no objection to the extension of the validity of the Environmental Authorisation.

4.9 Social Statement

A Social Statement was compiled by Mr Tony Barbour and is attached under Appendix C. A concise summary thereof follows below.

POLICY AND PLANNING ENVIRONMENT

For the purposes of meeting the objectives of the SIA the following policy and planning documents were reviewed:

- The National Energy Act (2008)
- The White Paper on the Energy Policy of the Republic of South Africa (December 1998)
- The White Paper on Renewable Energy (November 2003)
- Integrated Resource Plan (IRP) for South Africa (2010-2030)
- The National Development Plan (2011)
- Northern Cape Provincial Growth and Development Strategy (2004-2014)
- Northern Cape Climate Change Response Strategy
- Northern Cape Spatial Development Framework (2012)
- Northern Cape Province Green Document (2017/2018)
- Pixley ka Seme District Municipality Integrated Development Plan (2019-2020)
- Pixley ka Seme District Municipality Spatial Development Framework (2017)
- Emathanjeni Local Municipality Integrated Development Plan (2021-2022)

The proposed Mulilo De Aar PV SEF is in support of, and supported by, above-mentioned policies, guidelines and legislation.

OVERVIEW OF KEY SOCIAL ISSUES

SOCIAL ISSUES ASSOCIATED WITH THE CONSTRUCTION PHASE

Potential positive impacts

- Creation of employment and business opportunities, and opportunity for skills development and on-site training.

  Based on similar PV SEF projects the construction phase will extend over a period of ±18 months and create approximately 250 employment opportunities. The total wage bill for the construction phase is estimated to be in the region of R40 million (2022 Rand value). The majority of the employment opportunities, specifically the low and semi-skilled opportunities, are likely to be available to local residents in the area, specifically residents from De Aar. The majority of the beneficiaries are likely to be historically disadvantaged (HD) members of the community. This would represent a significant positive social benefit in an area with limited employment opportunities.

Potential negative impacts

- Impacts associated with the presence of construction workers on local communities.
- Impacts related to the potential influx of job-seekers.
- Increased risks to livestock and farming infrastructure associated with the construction related activities and presence of construction workers on the site.
- Increased risk of grass fires associated with construction related activities.
- Nuisance impacts, such as noise, dust, and safety, associated with construction related activities and vehicles.
- Impact on productive farmland.

The significance of the potential negative impacts with mitigation is likely to be *Low Negative*. The potential negative impacts can therefore be effectively mitigated.

SOCIAL ISSUES ASSOCIATED WITH THE OPERATIONAL PHASE

Potential positive impacts

- The establishment of infrastructure to generate renewable energy
- Creation of employment and business opportunities. The operational phase will also create opportunities for skills development and training.
    - The total number of permanent employment opportunities would be ±20. The majority of low and semi-skilled beneficiaries are likely to be HD members of the

community. Given the location of the proposed facility the majority of permanent staff is likely to reside in De Aar.
    - Procurement during the operational phase will also create opportunities for the local economy and businesses.
- Benefits associated with the establishment of a Community Trust
    - The establishment of a community benefit structure (typically, a Community Trust) also creates an opportunity to support local economic development in the area. The requirement for the project to allocate funds to socio-economic contributions (through structures such as Community Trusts) provides an opportunity to advance local community projects, which is guaranteed for a 20-year period (project lifespan). The revenue from the proposed SEF can be used to support a number of social and economic initiatives in the area, including but not limited to:
        - Creation of jobs
        - Education
        - Support for and provision of basic services
        - School feeding schemes
        - Training and skills development
        - Support for SMME's
- Generation of income for affected landowner/s
    - The income from the SEF reduces the risks to the livelihoods of the affected landowners posed by droughts and fluctuating market prices for sheep/cattle and farming inputs, such as fuel, feed etc. The additional income from the SEF would improve economic security of farming operations, which in turn would improve job security of farm workers and benefit the local economy.

Potential negative impacts

- The visual impacts and associated impact on sense of place (this is however addressed in the Visual Statement)
- Potential impact on tourism

Based on the findings of SIAs for PV SEF projects located near De Aar, the significance of all the potential negative impacts with mitigation, with the exception of the impact on sense of place which is assessed in the Visual Statement, is likely to be *Low Negative*. The potential negative impacts can therefore be effectively mitigated.

Cumulative impact

- *Cumulative impact on sense of place (tourism)*
  The potential cumulative impacts on the areas sense of place will be largely linked to potential visual impacts. Due to approved and planned renewable energy projects within the De Aar area, the likelihood of combined and sequential visual impacts exists. The potential for cumulative visual impacts on the areas sense of place is therefore high. Based on the findings from SIAs undertaken for other PV SEFs located near De Aar the significance

of the impact is likely to be *Medium Negative*. This rating correlates with the rating as given in the Visual Statement (refer to Section 4.8 above).

- *Cumulative impact on local services and accommodation*
  The establishment of the proposed PV SEF and the other renewable energy projects within the area may place pressure on local services, specifically medical, education and accommodation. This pressure will be associated with the potential influx of workers to the area associated with the construction and operational phases of renewable energy projects proposed in the area, including the proposed SEF. The potential impact on local services can be mitigated by employing local community members. Based on the findings from SIAs undertaken for other PV SEFs located near De Aar the significance of the impact is likely to be *Low Negative* with effective mitigation.

- *Cumulative impact on local economy*
  The establishment of the proposed PV SEF and other renewable energy projects in the area also has the potential to create a number of socio-economic opportunities within the district, which, in turn, will result in a positive social benefit. The positive cumulative impacts include the creation of employment, skills development and training opportunities, creation of downstream business opportunities. The Community Trusts associated with each project will also create significant socio-economic benefits. These benefits should also be viewed within the context of the limited economic opportunities in the area and the impact of the decline in the mining sector in recent years. Based on the findings from SIAs undertaken for other PV SEFs located near De Aar the significance of the impact is likely to be *High Positive* with effective enhancement.

MITIGATION

Note from EAP
The Environmental Management Programme (EMPr) for the Mulilo De Aar PV project was approved in the original EA issued in 2012. Some mitigation measures to address the social impact were provided in the EMPr but the mitigation as described below is in more detail and in line with current policies and guidelines. Mitigation given in the Social Statement which is already included in the EMPr is not mentioned below.

The mitigation measures should be added to the EMPr in terms of NEMA EIA Regulation 36(1) and should be reflected in the next environmental audit report that will be undertaken for this project.

MITIGATION DURING THE CONSTRUCTION PHASE

General

- Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.

- Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.

Employment

- Where reasonable and practical, the EA Holder should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories. However, due to the low skills levels in the area, the majority of skilled posts are likely to be filled by people from outside the area.
- Where feasible, efforts should be made to employ local contactors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria.
- Before the construction phase commences the EA Holder should meet with representatives from the Emthanjeni Local Municipality (ELM) to establish the existence of a skills database for the area. If such as database exists, it should be made available to the contractors appointed for the construction phase.
- The local authorities, community representatives, and organisations on the IAP database should be informed of the final decision regarding the project and the potential job opportunities for locals and the employment procedures that the EA Holder intends following for the construction phase of the project.
- Where feasible, training and skills development programmes for locals should be initiated prior to the initiation of the construction phase.
- The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.

Business

- The EA Holder should liaise with the ELM with regards the establishment of a database of local companies, specifically BBBEE companies, which qualify as potential service providers (e.g. construction companies, catering companies, waste collection companies, security companies etc.) prior to the commencement of the tender process for construction contractors. These companies should be notified of the tender process and invited to bid for project-related work.
- Where possible, the EA Holder should assist local BBBEE companies to complete and submit the required tender forms and associated information.
- The ELM, in conjunction with the local business sector and representatives from the local hospitality industry, should identify strategies aimed at maximising the potential benefits associated with the project.

Note that while preference to local employees and companies is recommended, it is recognised that a competitive tender process may not guarantee the employment of local labour for the construction phase.

Impact of construction workers on local communities and Influx of job seekers

- The SEP and CHSSP should include a Grievance Mechanism that enables stakeholders to report resolve incidents.
- Where possible, the EA Holder should make it a requirement for contractors to implement a 'locals first' policy for construction jobs, specifically for semi and low-skilled job categories.
- The EA Holder should consider the option of establishing a Monitoring Forum (MF) in order to monitor the construction phase and the implementation of the recommended mitigation measures. The MF should be established before the construction phase commences, and should include key stakeholders, including representatives from local communities, local ELM Councillor, farmers and the contractor(s). The MF should also be briefed on the potential risks to the local community associated with construction workers and should identify potential problems that may arise due to the influx of job seekers to the area.
- The EA Holder and the contractor(s) should, in consultation with representatives from the MF, develop a code of conduct for the construction phase. The code should identify which types of behaviour and activities are not acceptable. Construction workers in breach of the code should be dismissed. All dismissals must comply with the South African labour legislation.
- The EA Holder and the contractor should implement an HIV/AIDS awareness programme for all construction workers at the outset of the construction phase.
- The construction area should be fenced off before construction commences and no workers should be permitted to leave the fenced off area.
- The contractor should provide transport for workers to and from the site on a daily basis. This will enable the contactor to effectively manage and monitor the movement of construction workers on and off the site.
- Where necessary, the contractors should make the necessary arrangements to enable low and semi-skilled workers from outside the area to return home over weekends and/ or on a regular basis. This would reduce the risk posed to local family structures and social networks.
- The contractor must ensure that all workers from outside the area are transported back to their place of residence within 2 days of their contract coming to an end.
- It is recommended that no construction workers, with the exception of security personnel, should be permitted to stay over-night on the site.
- The EA Holder should implement a "locals first" policy, specifically with regard to unskilled and low skilled opportunities.
- The EA Holder should implement a policy that no employment will be available at the gate.

Risk to safety, livestock, and farm infrastructure

- The EA Holder should enter into an agreement with the local farmers in the area whereby damages to farm property etc. during the construction phase will be compensated for. The agreement should be signed before the construction phase commences.

- Traffic and activities should be strictly contained within designated areas.
- Strict traffic speed limits must be enforced on the farm.
- All farm gates must be closed after passing through.
- Contractors appointed by the EA Holder should provide daily transport for low and semi-skilled workers to and from the site. This would reduce the potential risk of trespassing on the remainder of the farm and adjacent properties.
- The EA Holder should consider the option of establishing a MF (see above) that includes local farmers and develop a Code of Conduct for construction workers. The Code of Conduct should be signed by the EA Holder and the contractors before the contractors move onto site.
- The EA Holder should hold contractors liable for compensating farmers and communities in full for any stock losses and/or damage to farm infrastructure that can be linked to construction workers. This should be contained in the Code of Conduct to be signed between the EA Holder, the contractors', and neighbouring landowners. The agreement should also cover loses and costs associated with fires caused by construction workers or construction related activities.
- Contractors appointed by the EA Holder must ensure that all workers are informed at the outset of the construction phase of the conditions contained on the Code of Conduct, specifically consequences of stock theft and trespassing on adjacent farms.
- Contractors appointed by the EA Holder must ensure that construction workers who are found guilty of stealing livestock and/or damaging farm infrastructure are dismissed and charged. This should be contained in the Code of Conduct. All dismissals must be in accordance with South African labour legislation.
- It is recommended that no construction workers, with the exception of security personnel, should be permitted to stay over-night on the site.

Increased risk of grass fires

- The option of establishing a fire-break around the perimeter of the site prior to the commencement of the construction phase should be investigated.
- As per the conditions of the Code of Conduct, in the advent of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor should also compensate the fire-fighting costs borne by farmers and local authorities.

MITIGATION DURING THE OPERATIONAL PHASE

Improve energy security and support the renewable energy sector

- Implement a skills development and training programme aimed at maximising the number of employment opportunities for local community members.
- Maximise opportunities for local content, procurement, and community shareholding.

Creation of employment opportunities

- The enhancement measures to enhance local employment and business opportunities during the construction phase, also apply to the operational phase.

Generate income for affected landowner/s

- The EA Holder has entered into rental agreements with the affected landowner for the use of the land and stipulations therein should be adhered to.

Enhance the benefits associated with the socio-economic development contributions

- The ELM should liaise with the EA Holders of other renewable energy projects in the area to investigate how best the Community Trusts can be established and managed so as to promote and support local, socio-economic development in the region as a whole.
- The ELM should be consulted as to the structure and identification of potential trustees to sit on the Trust. The key departments in the ELM that should be consulted include the Municipal Managers Office, IDP Manager and LED Manager.
- Clear criteria for identifying and funding community projects and initiatives in the area should be identified. The criteria should be aimed at maximising the benefits for the community as a whole and not individuals within the community.
- Strict financial management controls, including annual audits, should be instituted to manage the funds generated for the Community Trust from the SEF plant.

CONCLUSION

Based on the findings of SIAs undertaken for other PV SEFs located in the vicinity of De Aar the development of the proposed 100MW Mulilo De Aar PV SEF and associated infrastructure will create employment and business opportunities for locals during both the construction and operational phase of the project. All of the potential negative impacts, with the exception of the impact on sense of place, can also be effectively mitigated.

The establishment of a Community Trust will also benefit the local community. The significance of this impact is rated as **High Positive**. The proposed development will also represent an investment in clean, renewable energy infrastructure, which, given the negative environmental and socio-economic impacts associated a coal-based energy economy and the challenges created by climate change, represents a significant positive social benefit for society as a whole. The REIPPPP has also resulted in significant socio-economic benefits, both at a national level and at a local, community level. These benefits are linked to foreign Direct Investment, local employment and procurement and investment in local community initiatives.

Based on the findings of the Social Statement the Extension of Validity of Environmental Authorisation for the Mulilo De Aar PV and associated infrastructure is supported.

4.10 Environmental Sensitivity Map

The approved layout (as explained under Chapter 2) was guided by the Environmental Sensitivity Map and is still applicable and valid.

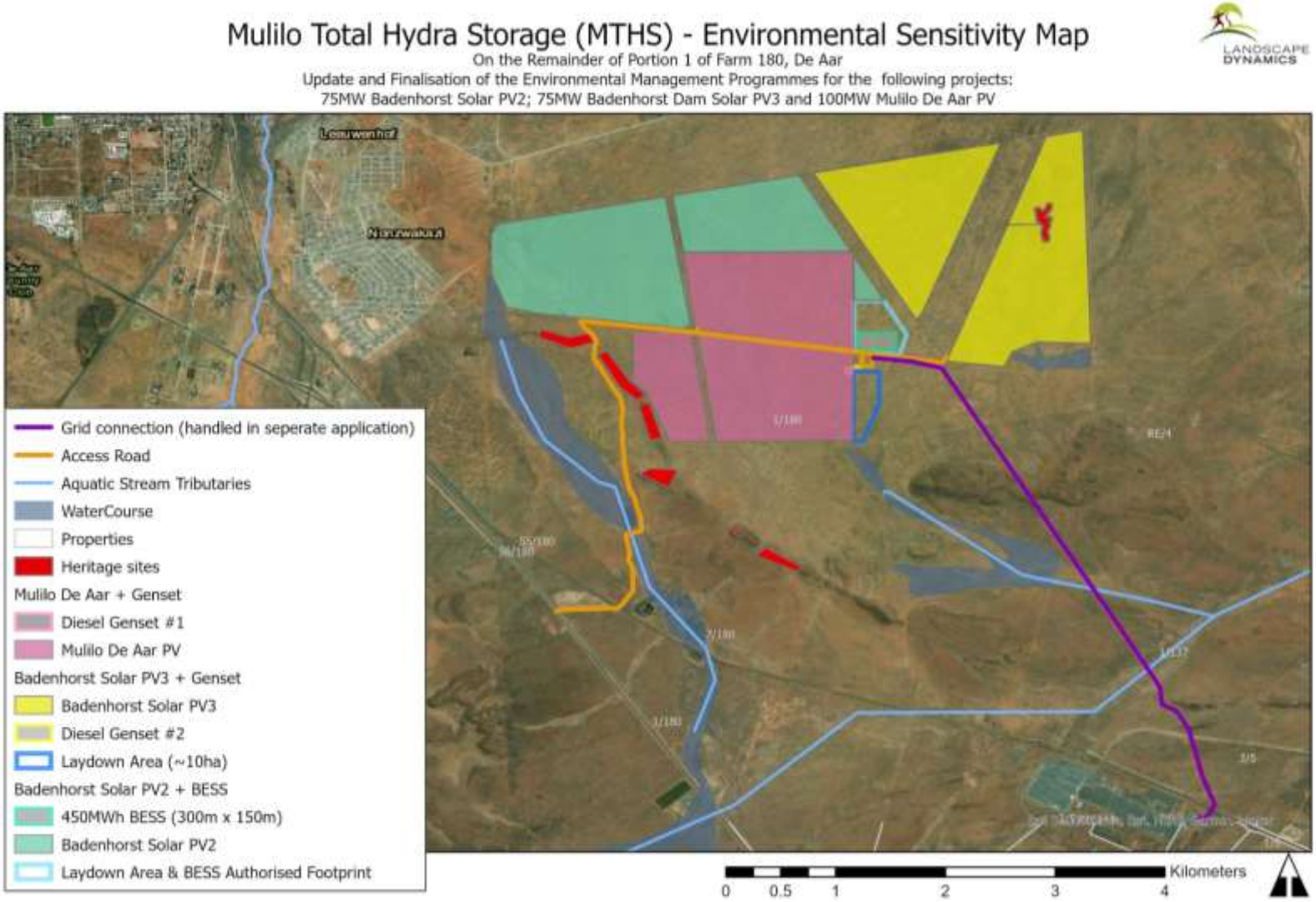


Figure 10: Environmental Sensitivity Map

CHAPTER 5: ENGINEERING REPORTS

5.1 Terms of Reference for the Engineering Reports

The engineers for this project received the same Terms of Reference as the specialists - please refer to Section 5.1 of this report.

5.2 Flood Line and Storm Water Statement Letter

A Flood Line and Storm Water Statement Letter was compiled by CivilConsult Consulting Engineers (attached under Appendix D) and is summarised below.

2012
A flood line analysis was conducted in 2012 by Aurecon Engineers and CivilConsult is in agreement with the outcome of that report.

Flood Line Analysis and Storm Water Management Report Conducted By CivilConsult In 2021
The findings as indicated in both reports are still valid and an updated report will not be required. The run-off areas and the layout did not change.

Comparison between the Reports Conducted by Aurecon Engineers and CivilConsult Engineers
The findings of both reports for the flood line analysis are similar. The small changes are due to the engineer's discretion in calculating the storm water run-off and other factors used in determining the flood line.

Final MTHS Layout Flood Line Requirements
The final MTHS layout incorporates the flood line analysis conducted by CivilConsult in 2021.

Other Requirements
No other mitigation measures are required from a storm water and flood line perspective for the Environmental Authorisation to be extended.

Recommendation
CivilConsult confirmed that there were no significant changes from a storm water and flood line perspective since the Environmental Authorisation was initially issued in 2012 and it is recommended that the Environmental Authorisation be extended.

5.3 Radio Frequency Interference

A Radio Frequency Interference (RFI) Assessment was undertaken by Interference Testing and Consultancy Services (Pty) Ltd (attached under Appendix D) and is summarised below.

The purpose of this assessment is to report on the possible RFI from the PV facility to the surrounding area and to assess whether any mitigation will be required to the PV facility power generation equipment if the PV facility is to be constructed.

According to the DFFE screening report there is one medium sensitivity area and one high sensitivity area close to the proposed development site. The proposed site is within 1km from a telecommunication facility and within 18km from a Weather Radar Installation. It is important to evaluate the possible RFI that the PV facility may have on this telecommunication facility and Weather Radar Installation.

RFI from a PV facility is generally emitted from the inverters, as solar panels do not emit any Radio Frequency (RF). RFI and electromagnetic interference (EMI) can influence sensitive facilities such as airports, RF high sites, railway line control equipment, cell phone towers, EMI sensitive equipment in the area, etc. If a PV facility influences existing infrastructure, EMI mitigation will have to be implemented. As the project is still in early planning stage, no Technology partner has been selected yet. It is therefore assumed that the inverters to be used will comply to CISPR 11 Class A [1].

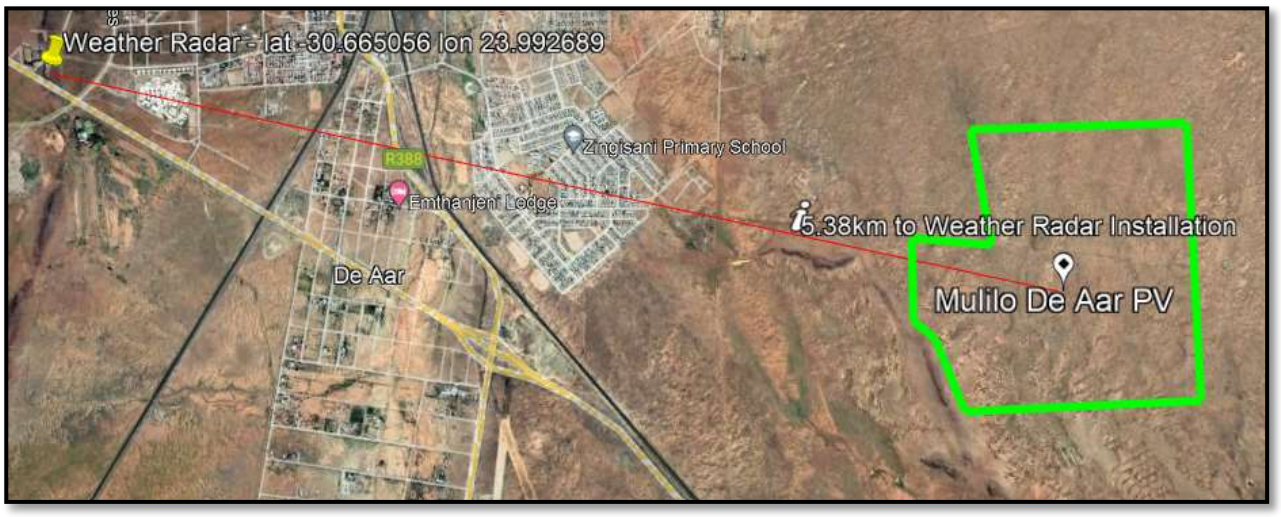


Figure 11: Mulilo De Aar PV Location relative to the Weather Radar Installation

The map above shows the proposed PV facility relative to the Weather Radar Installation (5.38 km away). The exact location of the telecommunications facility could not be identified.

CLEARANCE ZONE

The clearance zone around a PV facility and switching station is the separation distance needed between the edge of the PV facility (source) to a specific EMI sensitive location or infrastructure (victim), for the PV facility to have no RFI impact on existing electrical/electronic infrastructure. It is assumed that the inverters that will be used comply to CISPR11 Class A specification (57 dBµV/m @ 3m).

Table 7: Recommended Clearance Zone Distances

EMI sensitive location	Distance Between the Edge of a PV facility and an EMI sensitive location in meter
Existing Radar equipment ex. Weather radar	152.4 m
Navigational and communication equipment	45.72 m
Equipment sensitive to EMI	45.72 m
Airfield/Airport Radar system	76.20 m

COVERAGE MAP, TYPICAL RECEIVER SENSITIVITIES AND SITE TRANSMIT POWER

A 1km radius point has been chosen away from the edge of the proposed PV facility to measure the received power that a possible telecommunications facility at 1km could experience. The received power at the 1km reference point is -126.7 dBm, this is lower than the sensitivity for GSM/LTE/GPRS transceivers listed in the table below. The received power at the weather radar installation is -147.3 dBm, which is lower than the sensitivity for a pulse radar transceiver listed in the table below.

Table 8: List of typical sensitivities from EMI sensitive equipment

Receiver	Typical Sensitivities
LoRa 2.4GHz	-130 dBm
Pulse Radar 1-12GHz	-94 dBm
Wifi (common 802.11g) 2.4/5 GHz	-85 dBm
GSM/LTE/GPRS 0.85-2.1GHz	-102 dBm
UHF 300MHz	-100 dBm
Bluetooth 2.4GHz	-82 dBm

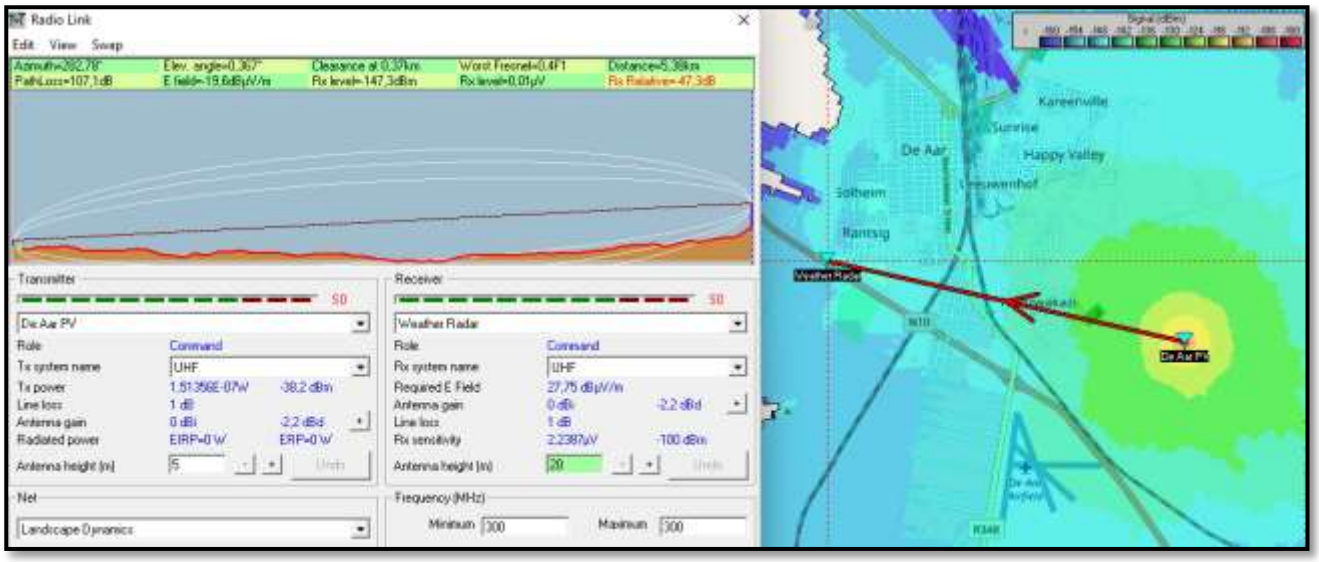


Figure 12: Signal Strength Coverage Map from the PV Facility to the Weather Radar Installation

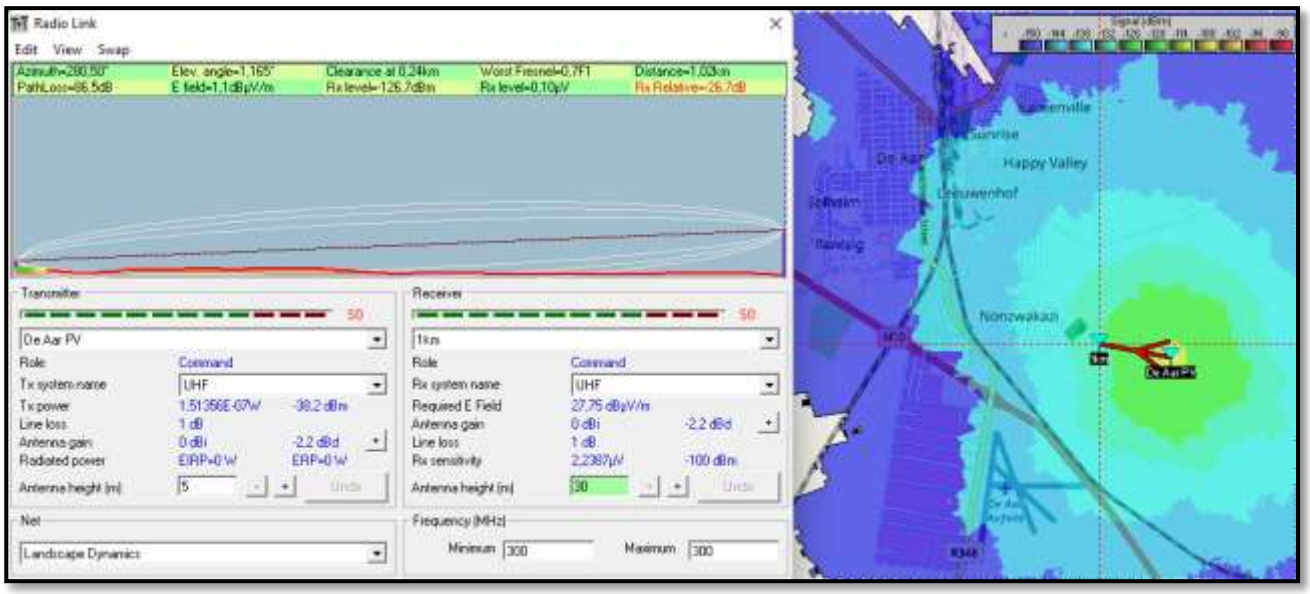


Figure 13: Signal strength coverage map from the PV facility to a chosen 1km point

CUMULATIVE EFFECT

Non-correlated noise sources such as PV facility inverters in close proximity could increase the clearance zone required around a specific renewable energy plant site, as the level of unintentional radiated emissions will be higher. A standard factor of 10 $\log_{10}$ N, where N = amount of renewable energy plants in the direct vicinity, is used to account for the increased radiated emission levels.

For the theoretical worst-case scenario, the theoretical increase in radiated emission levels will be 16.4 dB. This results in the clearance zone requirement to be extended from 152.4m to 700m.

Thus, a new clearance zone of 700m should be adhered to around the Mulilo De Aar PV facility. Receivers with sensitivity levels less than -107dBm should not be used within this exclusion zone.

The two figures below show the received power at the 1km reference point and the received power at the weather radar installation, of which both are below the respective sensitivity levels listed in the sensitivity table above.

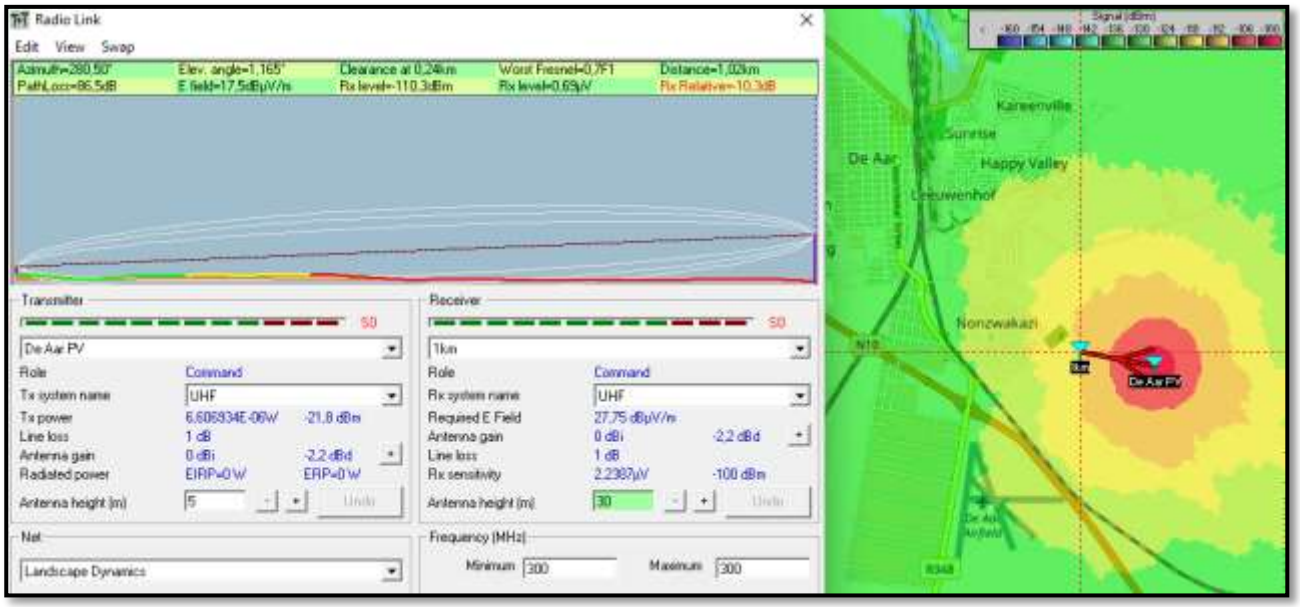


Figure 14: Signal strength coverage map from the PV facility to a chosen 1km point with the cumulative effect considered

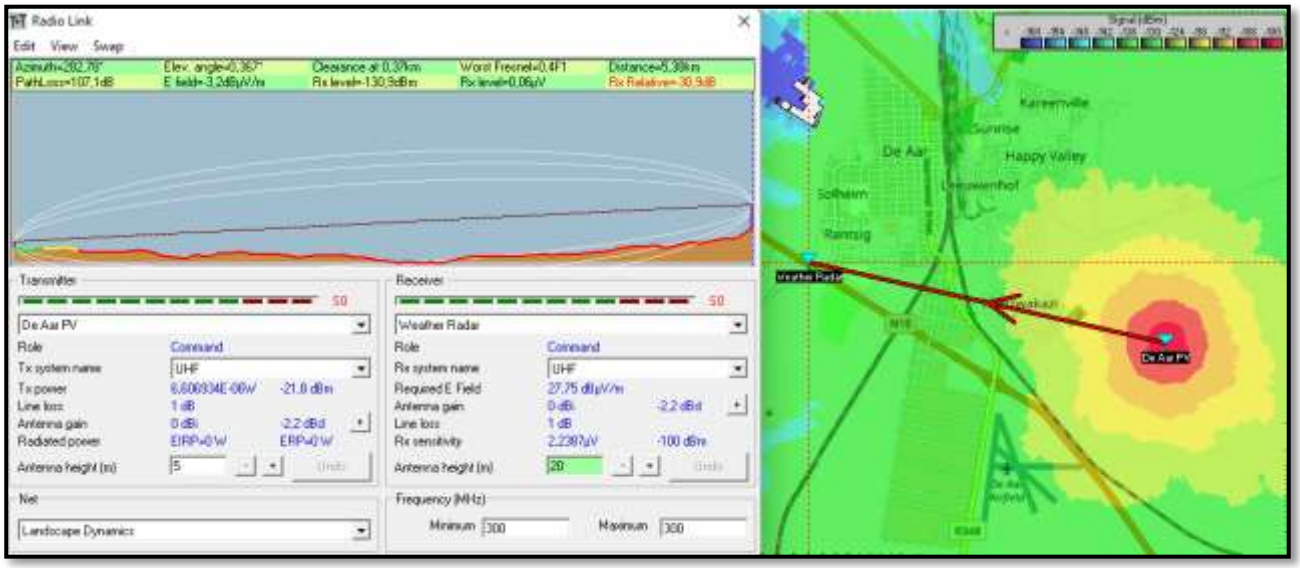


Figure 15: Signal strength coverage map from the PV facility to the weather radar installation with the cumulative effect considered

CONCLUSION

This results in the clearance zone requirement to be extended from 152.4m to 700m. Thus, a new clearance zone of 700m should be adhered to around the Mulilo De Aar PV facility.

The clearance zone around the Mulilo De Aar PV facility is extended from 152.4m to 700m when the cumulative effect of the nearby renewable energy plants is considered. If the 700m theoretical worst-case clearance zone is adhered to, then the Mulilo De Aar PV facility will have **no RFI impact** on equipment in the surrounding area.

Mulilo De Aar PV Facility poses a very low to no RFI or EMI risk to the surrounding equipment.

CHAPTER 6: PUBLIC PARTICIPATION

6.1 Objectives of the Public Participation Programme

The main aim of public participation is to ensure transparency throughout the environmental process. The objectives of public participation in this EA amendment application are the following:

- To identify all potentially directly and indirectly affected stakeholders, government departments, municipalities and landowners;
- To communicate the proposed project in an objective manner with the aim to obtain informed input;
- To assist the Interested & Affected Parties (IAPs) with the identification of issues of concern, and providing suggestions for enhanced benefits and alternatives;
- To obtain the local knowledge and experience of IAPs;
- To communicate the proceedings and findings of the specialist studies;
- To ensure that informed comment is possible; and
- To ensure that all concerns, comment and objections raised are appropriately and satisfactorily documented and addressed.

6.2 Public Participation Process Followed

All applicable public participation documentation is attached under Appendix E.

The public participation programme (PPP) that is being followed is described below. The PPP is being conducted in terms of Sections 39, 40, 41, 42, 43 & 44 of the NEMA EIA Regulations 2014, as amended.

- ***IAP Register: Landowner, Government Departments, Municipalities and other IAPs***
  An Interested & Affected Party (IAP) register was compiled which includes the directly affected landowners, adjacent landowners, municipalities, government departments and other applicable organisations. This register is being updated throughout this process.

- ***Onsite notification***
  Two A2 laminated onsite notices were placed on 11 July 2022 at the following places:
  - Along the N10 highway at the corner of Portion 1 of the Farm De Aar No 180
  - At the entrance to the De Aar Post Office

- ***Newspaper advertisement***
  A newspaper advertisement was placed in The Echo on 8 July 2022.

- ***First Phase Notification***
  A Notification Letter was distributed to everyone on the IAP Register for a 30-day commenting period (6 July - 5 August 2022).

- ***Distribution of the Draft Motivation Report***
  The Draft Motivation Report (this document) is being distributed as follows:
  - All IAPs identified in the IAP Register received notification via email that the Draft Motivation Report is available for comment (proof thereof will be provided in the Final Motivation Report).
  - The Draft Motivation Report is being distributed for a 30-day (plus holidays) commenting period.
  - All IAPs received an email with the Draft Motivation Report as an attachment. A link to the Draft Motivation Report and all the Appendixes is available on the Landscape Dynamics website (www.landscapedynamics.co.za) – detailed instructions on how to access these documents were provided in the said email.
  - The report was submitted to DFFE for comment via their online system.

- ***Submission of Final Motivation Report***
  Comment received on the Draft Motivation Report will be included in the Final Motivation Report. The Final Motivation Report will be submitted to DFFE for their consideration for the extension of the validity period of the current Environmental Authorisation.

6.3 Comment received during the Initial Advertising Period

A Notification Letter was distributed to all IAPs and a 30-day commenting period (6 July – 5 August 2022) applied.

Table 9: Comment received on the Notification Letter

Endangered Wildlife Trust: Wildlife and Energy Programme Manager: Mr Lourens Leeuwner **Response from Landscape Dynamics is provided in blue**
Mr Leeuwner requested that future emails should be send to eia@ewt.org.za. 1. The IAP register was amended accordingly 2. No further comment was received

SAHRA: Ms Natasha Higgit **Response from Landscape Dynamics is provided in blue**
SAHRA acknowledge receipt of the request for comment and will inform Landscape Dynamics once comments are issued. 1. No further comment was received

South Africa National Roads Agency: Mr Ria Barkhuizen
Response from Landscape Dynamics is provided in blue

This email is an acknowledgement of receipt for your enquiry. Please note that in line with requirements of Section 29 of the Spatial Planning and Land Use Management Act (Act No 16 of 2013) read with Section 3 of the Promotion of Administrative Justice Act (Act No 3 of 2000) SANRAL have 30 days to acknowledge receipt of your application and 90 days to evaluate and provide response. Should you not receive any response within 120 days, kindly follow up on the enquiry by responding to Jan Oliver who will be dealing with it and will convert back to you. He can be contacted on (012) 426-6242 / Cell 081 010 6403.

1. Our request is made in terms of the National Environmental Management Act (NEMA) and the following is applicable:
   Chapter 2, Section 3(4) of the NEMA 2014 EIA Regulations states:
   "When a State Department is requested to comment in terms of these Regulations, such State Department must submit its comments in writing within 30 days from the date on which it was requested to submit comments and if such State Department fails to submit comments within such 30 days, it will be regarded that such State Department has no comment"
2. No further comment was received

Transnet Freight Rail: Ms Zanele Manyatji
Response from Landscape Dynamics is provided in blue

Ms Zanele forwarded the notification email to a colleague, for attention Sam Fiff.

1. No further comment was received

6.4 Comment Received on the Draft Motivation Report

Comment received on Draft Motivation Report will be included in the Final Motivation Report that will be submitted to the DFFE for approval / refusal of the EA amendment application. The IAPs will be informed of their right to appeal DEFF's decision.

CHAPTER 7: CONCLUSION and AFFIRMATION

7.1 Environmental Impact Statement

Certain questions need to be answered when determining the acceptability of extending an EA beyond 10 years. These questions, including the responses of each specialist as well as engineers, are shown in the table below.

Table 10: Summary of findings	**Fauna & Flora**	**Avifauna**	**Aquatic**	**Heritage**	**Visual**	**Agricultural**	**Socio-economic**	**Hydrology**	**RFI**
Has the environment as assessed in 2012 changed to such an extent that it could influence the viability of the project?	No	No	No	No	No	No	N/a	No	No
Is the impact rating as provided in the initial assessment valid?	Yes	Yes	Yes	Yes	Yes	Yes	N/a	Yes	Yes
Is the mitigation measures provided in the initial assessment still applicable?	Yes	Yes	Yes	Yes	Yes	Yes	N/a	Yes	Yes
Is there any new mitigation to be included into the EA?	No	No	No	No	No	No	Yes	No	No
Is the cumulative impact acceptable?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Should the request to extend the commencement period be granted by DFFE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

7.2 Assumptions, Uncertainties, and Gaps in Knowledge

Assumptions

It is assumed that all documentation and information obtained from the different stakeholders, professional team members and specialists are accurate, unbiased and valid.

Uncertainties

The proposal to extend the EA validity period in relation to its environment was thoroughly investigated by various specialists and professionals and there are therefore no uncertainties with regards to the project as proposed.

Gaps in knowledge

No obvious gaps in knowledge are known. It is not foreseen that any information not included in the report will change the outcome of the recommendations.

7.3 Recommendation by the Environmental Assessment Practitioner

The Environmental Management Programme (EMPr) for the Mulilo De Aar PV project was approved in the original EA issued in 2012. Some mitigation measures to address the social impact were provided in the EMPr but the mitigation as given under "Section 4.9: Social Statement" of this report is in more detail and in line with current policies and guidelines. This mitigation measures should be added to the EMPr in terms of **NEMA EIA Regulation 36(1)** and should be reflected in the next environmental audit report that will be undertaken for this project.

Based on the information provided in this report and summarised in the table above, the EAPs can, with confidence, state that the impacts the proposed Mulilo De Aar PV SEF will have on the environment were thoroughly assessed, significant changes to the environment since 2012 did not occur, the impact ratings as provided in the 2012 EIA assessments are still valid, apart from mitigation provided in the Social Statement no new mitigation is proposed and the cumulative impact is acceptable. **It is strongly recommended that the application for the extension of the validity period of the EA be granted**.

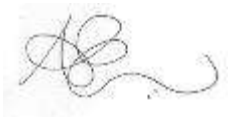
7.4 Affirmation by the Environmental Assessment Practitioner

We, Susanna Nel & Annelize Erasmus, herewith affirm the following:

- The information contained in this report is to the best of our knowledge and experience correct.
- All relevant comment and input provided by the stakeholders and IAPs are included and addressed in this Motivation Report.
- Input and recommendations from the specialist reports are provided in and integrated in

the Motivation Report.

- All information made available by the EAP to IAPs and any responses thereto as well as comment and input from IAPs are provided in the Motivation Report.



Susanna Nel
DATE: 26 July 2022

Annelize Erasmus
DATE: 26 July- 2022

A copy of this Affirmation was certified by SAPS and is attached under Appendix F.

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