DRAFT BASIC ASSESSMENT REPORT

02 August 2021

DEVELOPMENT OF A POWER LINE FOR THE SONVANGER PHOTOVOLTAIC SOLAR POWER PLANT NEAR THEUNISSEN, FREE STATE PROVINCE

NAMICS

ENVIRO

PROJECT DETAIL

DEFFE Reference No.	**:**	To be confirmed
Project Title	**:**	Development of an overhead power line for the Sonvanger Photovoltaic Solar Power Plant near Theunissen, Free State Province.
Authors	**:**	Ms. Lisa Opperman
Client	**:**	Pele Green Energy (Pty) Ltd
Report Status	**:**	Draft Basic Assessment Report
Submission date	**:**	02 August 2021

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

PLATES

APPENDICES

Appendix D5: Heritage Screening Study

Appendix E: Assessment

Appendix E1: Significance of potential impacts

Appendix F: Environmental Management Programme (EMPr)

Appendix F1: Generic EMPr for the power line infrastructure

Appendix F2: Generic EMPr for the substation infrastructure

Appendix G: Additional Information – *Not Applicable*

GLOSSARY OF TERMS AND ACRONYMS

BA	Basic Assessment
BAR	Basic Assessment Report
CEA	Cumulative Effects Assessment
DFFE	Department of Forestry, Fisheries and the Environment
DM	District Municipality
DoE	Department of Energy
DMRE	Department of Mineral Resources and Energy
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EP	Equator Principles
EPFI	Equator Principles Financial Institutions
Environmental impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects.
GNR	Government Notice Regulation
I&AP	Interested and affected party
IDP	Integrated Development Plan
IFC	International Finance Corporation
IPP	Independent Power Producer
kV	Kilo Volt
Mitigate	Activities designed to compensate for unavoidable environmental
MW	Megawatt
NEMA	National Environmental Management Act No. 107 of 1998
NERSA	National Energy Regulator of South Africa
NWA	National Water Act No. 36 of 1998
PPP	Public Participation Process
PV	Photovoltaic

REIPPP	Renewable Energy IPP Procurement Process
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework

CONTEXT FOR THE DEVELOPMENT

According to Eskom, the demand for electricity in South Africa has been growing at approximately 3% per annum. This growing demand, fuelled by increasing economic growth and social development, is placing increasing pressure on South Africa's existing power generation capacity. Coupled with this, is the growing awareness of environmentally responsible development, the impacts of climate change and the need for sustainable development. The use of renewable energy technologies, as one of a mix of technologies needed to meet South Africa's future energy consumption requirements has been enshrined in the Integrated Resources Plan (2010 - 2030, as amended), which forms part of the national Department of Mineral Resources and Energy (DMRE) (previously known as Department of Energy (DoE) long-term strategic planning and research process.

The Sonvanger Photovoltaic Solar Power Plant received an Environmental Authorisation(EA) from the Department of Forestry, Fisheries and the Environment (DFFE), previously known as the Department of Environmental Affairs (DEA), on 10 June 2015 (ref.: 14/12/16/3/3/2/672). The primary rationale for the proposed solar photovoltaic (PV) facility is to add new generation capacity from renewable energy source to the national electricity mix and to aid in achieving the goal of 42% share of all new installed generating capacity being derived from renewable energy forms, as targeted by DoE (Integrated Resource Plan Update 2010-2030). In terms of the Integrated Resource Plan Update (IRP Update, 2010-2030), over the short term (of the next two or three years), clear guidelines arose; namely to continue with the current renewable bid programme with additional annual rounds of 1000 MW PV, with approximately 8.4GW of the renewable energy capacity planned to be installed from PV technologies over the next twenty years.

To contribute towards this target and to stimulate the renewable energy industry in South Africa, the need to establish an appropriate market mechanism was identified, and the Renewable Energy Independent Producer's (REIPPP) Procurement Programme process was announced in August 2012, with the intention of DoE to purchase 3,750MW of renewable energy from IPPs to be delivered to the national grid by end of 2016 under a 20-year Power Purchase Agreement to be signed with Eskom. The establishment of the REIPPP Procurement Programme in South Africa provides the opportunity for an increased contribution towards the sustained growth of the renewable energy sector in the country, the region and internationally, and promote competitiveness for renewable energy with conventional energies in the medium- and long-term.

In order for the authorised Sonvanger Photovoltaic Solar Power Plant to connect to the national grid Pele Green Energy (Pty) Ltd (PGE) is proposing the development of grid connection infrastructure to enable the evacuation of power generated from the authorised solar plant to the national grid (refer to Figure 1 for the locality map). The infrastructure proposed consists of a single-circuit 132kV power line, with the associated infrastructure required for the operation of the authorised facility. If the Sonvanger Photovoltaic Solar Power Plant is selected as a preferred bidder by the Department of Mineral Resources and Energy (DMRE), it is expected to reach Financial Close by latest December 2021. The authorisation of this proposed power line is a necessity in terms of the authorisation requirements. As such, this Basic Assessment process and Application for Environmental Authorisation is for the development of a 132kV overhead power line connecting the Sonvanger Photovoltaic Solar Power Plant to the existing Oryx-Joel 132kV power Line.

EXECUTIVE SUMMARY

Like many other small and developing municipalities in the country, the Masilonyana Local Municipality faces a number of challenges in addressing the needs and improving the lives of the community (IDP, 2019-2020). The Integrated Development Plan (IDP) of the local municipality identifies specific weaknesses and threats to the area which includes initiatives for development, maintenance of infrastructure, delivery of basic services, poor road infrastructure and unemployment. The IDP of the local municipality also identifies strategic objectives which includes (1) sustainable services to community, (2) promotion of a sound environmental management system, (3) provision of sound governance for local communities and (4) ensuring sound governance practices within the municipality.

The Sonvanger Photovoltaic Solar Power Plant (hereafter referred to as Sonvanger SPP) was issued with an EA for the development of an 84MW photovoltaic solar facility and associated infrastructure on the Remaining Extent of Portion 1 of the farm Karreebooms Vallei 258, Registration Division Theunissen, Free State Province situated within the Masilonyana Local Municipality area of jurisdiction (within the larger Lejweleputswa District Municipality). The SPP is located ~4km south west of the town of Theunissen. The total footprint of the SPP project is approximately 264 hectares (including supporting infrastructure on site).

This Application for Environmental Authorisation and Basic Assessment process is for the connection of an approved project to the national grid via a single-circuit 132kV overhead power line. This new power line will connect the SPP to the existing Oryx-Joel 132kV power line located at the Beatrix Mine (Sibanye Stillwater). For this Basic Assessment a larger grid connection corridor has been identified within which the power line route will be placed. The corridor is 200m wide and 22km in length; and was assessed within this BA Report. A 132kV substation (1ha in extent) and service road associated with the power line is also included as part of the development (required associated infrastructure). The grid connection corridor is located directly to the west of the town of Theunissen (along the R30 Regional Road).

The Environmental Impact Assessment (EIA) Regulations, 2014, as amended (Regulation 326) determine that an environmental authorisation is required for certain listed activities, which might have detrimental effects on the environment. The following activities has been identified with special reference to the proposed development and is listed in the EIA Regulations:

- Activity 11(i) (GN.R. 327): *"The development of facilities or infrastructure for the transmission and distribution of electricity outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts."*
- Activity 12(ii)(a)(c) (GN.R. 327): "*The development of (ii) infrastructure or structures with a physical footprint of 100 square meters or more (a) within a watercourse or (b) within 32 meters of a watercourse, measured from the edge of a watercourse."*
- Activity 19 (GN.R. 327): "*The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil sand, shells, shell grit, pebbles or rock of more than 10 cubic meters from a watercourse"*
- Activity 27 (GN.R. 327): *"The clearance of 1 hectares or more, but less than 20 hectares of indigenous vegetation."*
- Activity 4(b)(i)(bb)(ee) (GN.R. 324): *"The development of a road wider than 4 meters with a reserve less than 13,5m (b) in the Free State Province (i) outside urban areas within (ee)*

Critical Biodiversity Areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans."

- Activity 12(b)(i)(ii)(iv) (GN.R 324): *"The clearance of an area of 300 square meters or more of indigenous vegetation in the (b) Free State (i) within critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA, or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004, (ii) within critical biodiversity areas identified in bioregional plans and (iv) areas within a watercourse or wetland, or within 100 metres from the edge of a watercourse or wetland."*
- Activity 14(ii)(a)(c)(b)(i)(ff) (GN.R 324): "*The development of (ii) infrastructure or structures with a physical footprint of 10 square metres or more, where such development occurs (a) within a watercourse, or (c) within 32 meters of a watercourse, measure from the edge of a watercourse, within (b) the Free State, (i) outside urban areas, within (ff) critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans."*

Being listed under Listing Notice 1 (Regulation 327) implies that the development is considered as potentially having a potential impact on the environment. Subsequently a 'basic assessment process' is required as described in Regulations 19 - 20. Environamics has been appointed as the independent consultant to undertake the Basic Assessment (BA) for the grid connection infrastructure on behalf of Pele Green Energy (Pty) Ltd.

Regulation 19 of the 2014 EIA Regulations (as amended) requires that a BA report must contain the information set out in Appendix 1 to the Regulations or comply with a protocol or minimum information requirements relevant to the application as identified and gazetted by the Minister in a government notice. Appendix 1 to GN. R. 326 requires that the environmental outcomes, impacts and residual risks of the proposed activity be set out in the Basic Assessment Report (BAR).

It has been determined that the proposed development will have a net positive impact for the area and will subsequently ensure the optimal utilisation of resources. This is based on the fact that that the proposed grid connection infrastructure will enable the operation and evacuation of generated solar electricity into the national grid from an authorised Solar Power Plant. All negative environmental impacts can be effectively mitigated through the proposed mitigation measures and no residual negative impacts are foreseen. The potentially most significant environmental impacts associated with the development are briefly summarized below:

Impacts during the construction phase:

Construction of the power line will potentially result in the following impacts: habitat destruction and fragmentation, soil erosion and sedimentation, air, soil and water pollution, spread and establishment of alien invasive species, faunal impacts, impact on watercourses, displacement and disturbance of avifauna species, impacts to heritage objects, generation of waste, socio-economic impacts and safety and security impacts.

The impacts expected to occur during the construction phase will mainly have a significance of low and negligible with some impacts being considered as medium (with mitigation). No impacts of a high significance is expected to occur.

Impacts during the operational phase:

The proposed power line, substation and associated servitude will require routine maintenance work throughout the operational phase. The negative impacts are generally associated with visual

impacts, avifauna impacts, soil impacts and social impacts. The operational phase will have a direct positive impact through local employment and business opportunities, skills development and training, and the development of infrastructure for the generation of clean, renewable energy. The significance of the expected impacts are considered to be medium and low, with no impacts of a high significance expected to occur (this being with the implementation of mitigation).

Impacts during the decommissioning phase:

The photovoltaic solar energy facility has a lifespan of between 20 and 30 years from where the project and its associated infrastructure will be decommissioned or upgraded. If the solar plant is not decommissioned the power line and the substation is expected to have a lifespan of more than 40 years (with maintenance) and the infrastructure will only be decommissioned once it has reached the end of life, or if no longer required. Upon decommissioning, the power line and substation would be disassembled and the components removed from site. The physical environment will benefit from the decommissioning of the infrastructure since the site will be restored to its natural state. During the decommissioning phase the following impacts are foreseen: erosion, impacts to fauna and flora and fauna and the generation of waste.

Cumulative impacts:

According to the DEFF's database seven (07) solar PV plant applications have been submitted to the Department within the geographic area of investigation. Given the location of the solar projects and therefore their associated grid connection infrastructure within 30km of the Sonvanger site, the potential for cumulative impacts are deemed to be medium. The potentially most significant cumulative impact during the construction phase relate to the loss or fragmentation of habitats, impacts on avifauna, temporary employment and the impact of construction workers on local communities and influx of job seekers. The potential cumulative effects during the operational phase relate to visual impacts, avifauna impacts and the development of infrastructure for the generation of clean, renewable energy. During the decommissioning phase, the generation of waste and visual intrusion may result in cumulative impacts.

In accordance with the EIA Regulations, this BAR evaluates and rates each identified impact, and identifies mitigation measures which will be required in order to ensure the avoidance of negative residual risks. The report also considers potential positive impacts and enhancement measures to increase the significance of the positive impacts. This BAR also contains information that is necessary for the competent authority (DFFE) to consider the application and to reach a decision contemplated in Regulation 20.

1 INTRODUCTION

This section aims to introduce the Basic Assessment Report (BAR) and specifically to address the following requirements of the regulations:

Appendix 1. (3) A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include-
(a) details of:

(i) the EAP who prepared the report; and

(ii) the expertise of the EAP, including a curriculum vitae.

1.1 LEGAL MANDATE AND PURPOSE OF THE REPORT

Regulations No. 326, 327, 325 and 324 (of 07 April 2017) promulgated in terms of Section 24(5) and 44 of the National Environmental Management Act, (107 of 1998) determine that an BA process should be followed for certain listed activities, which might have a detrimental impact on the environment. According to Regulation No. 326 the purpose of the Regulations is: *"…to regulate the procedure and criteria as contemplated in Chapter 5 of the Act relating to the preparation, evaluation, submission, processing and consideration of, and decision on, applications for environmental authorisations for the commencement of activities, subjected to environmental impact assessment, in order to avoid or mitigate detrimental impacts on the environment, and to optimise positive environmental impacts, and for matters pertaining thereto*".

The EIA Regulations No. 327 and 324 outline the activities for which a BA process should apply. The following listed activities with special reference to the proposed activity is relevant to the proposed development:

Table 1.1: Listed activities

Relevant notice:	**Activity No (s)**	**Description of each listed activity as per project description**:
GNR. 327, 07 April 2017	Activity 11(i)	• *"The development of facilities or infrastructure for the transmission and distribution of electricity (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts."* • The development of a 132kV single-circuit power line (and 132kV substation) is required to enable the connection of the authorised Sonvanger Photovoltaic Solar Power Plant (DFFE ref.: 14/12/16/3/3/2/672) to the national grid network. A 200m wide and 22km long grid connection corridor is being assessed for the placement of the power line route and substation. The 132kV power line is proposed to connect into the existing Eskom Oryx-Joel 132kV Power Line.

GNR. 327, 07 April 2017	Activity 12(ii)(a)(c)	• *"The development of (ii) infrastructure or structures with a physical footprint of 100 square meters or more (a) within a watercourse or (b) within 32 meters of a watercourse, measured from the edge of a watercourse."* • The power line requires the development of a service road and pylon infrastructure which will exceed 100 square meters in extent. Surface water features, including wetlands and drainage channels, are present within the grid connection corridor that will need to be crossed by the service road.
GNR. 327, 07 April 2017	Activity 19	• *"The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil sand, shells, shell grit, pebbles or rock of more than 10 cubic meters from a watercourse"* • The power line requires the development of a service road. Surface water features, including wetlands and drainage channels, are present within the grid connection corridor that will need to be crossed by the service road. This will require the removal and moving of soils of more than 10 cubic meters.
GNR. 327, 07 April 2017	Activity 27	• *"The clearance of 1 hectares or more, but less than 20 hectares of indigenous vegetation."* • The development of the 132kV substation proposed as part of the project will require the clearance of 1 hectare of indigenous vegetation.
GNR. 324, 07 April 2017	Activity 4(b)(i)(bb)(ee)	• *"The development of a road wider than 4 meters with a reserve less than 13,5m (b) in the Free State Province (i) outside urban areas within (ee) Critical Biodiversity Areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans."* • The power line will require a service road of ~4m in width. The grid connection corridor infringes on areas identified as being CBA 1 as per the 2015 Free State Biodiversity Plan.
GNR. 324, 07 April 2017	Activity 12(b)(i)(ii)(vi)	• *"The clearance of an area of 300 square meters or more of indigenous vegetation in the (b) Free State (i) within critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA, or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004, (ii) within critical biodiversity areas identified in bioregional plans and (iv) areas within a watercourse or wetland, or within 100 metres from the edge of a watercourse or wetland."* • The power line, substation and the associated service road will require more than 300 square meters of

		vegetation clearance. The grid connection corridor infringes on areas identified as Vaal-Vet Sandy Grassland which is classified as Endangered and areas identified as being CBA 1 as per the 2015 Free State Biodiversity Plan. Surface water features, including wetlands and drainage channels, are present within the grid connection corridor that will need to be crossed by the service road.
GNR. 324, 07 April 2017	Activity 14(ii)(a) (c)(b)(i)(ff)	• "*The development of (ii) infrastructure or structures with a physical footprint of 10 square metres or more, where such development occurs (a) within a watercourse, or (c) within 32 meters of a watercourse, measure from the edge of a watercourse, within (b) the Free State, (i) outside urban areas, within (ff) critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans."* • The power line requires the development of a service road and pylon infrastructure which will exceed 10 square meters in extent. Surface water features, including wetlands and drainage channels, are present within the grid connection corridor that will need to be crossed by the service road. The grid connection corridor infringes on areas identified as CBA 1 as per the 2015 Free State Biodiversity Plan

Being listed under Listing Notices 1 and 3 implies that the proposed activity is considered as potentially having a potential impact on the environment. Subsequently a 'basic assessment process' is required as described in Regulations 19 - 20. According to Appendix 1 of Regulation 326, the objective of the basic assessment process is to, through a consultative process:

- Determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
- Identify the alternatives considered, including the activity, location, and technology alternatives;
- Describe the need and desirability of the proposed alternatives;
- Through the undertaking of an impact and risk assessment process, inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine —
    - The nature, significance, consequence, extent, duration and probability of the impacts occurring; and
    - degree to which these impacts-

- can be reversed;
- may cause irreplaceable loss of resources, and
- can be avoided, managed or mitigated; and

- Through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to –
    - Identify and motivate a preferred site, activity and technology alternative;
    - Identify suitable measures to avoid, manage or mitigate identified impacts; and
    - Identify residual risks that need to be managed and monitored.

This report is the Draft Basic Assessment Report (DBAR) to be submitted to the Department of Forestry, Fisheries and the Environment (DFFE), who is the decision-making authority on the projects as the proposed development relates to the Integrated Resource Plan. According to Regulation 326 all registered I&APs and relevant State Departments must be allowed the opportunity to review the report. The draft BAR has been made available to registered I&APs and all relevant State Departments. They have been requested to provide written comment on the draft BAR within 30 days of receiving notification of its availability for review and comment. All issues identified during this review period will documented and compiled into a Comments and Response Report as part of the Final BAR, and will be addressed in the Final BAR, as relevant.

1.2 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Environamics was appointed by the applicant as the independent EAP to conduct the BA and prepare all required reports. All correspondence to the EAP can be directed to:

Contact person: Lisa Opperman

Postal Address: 14 Kingfisher Street, Tuscany Ridge Estate, Potchefstroom, 2531

Telephone: 084 920 3111 (Cell)

Electronic Mail: lisa@environamics.co.za

Regulation 13(1)(a) and (b) determines that an independent and suitably qualified and experienced EAP should conduct the BA process. In terms of the independent status of the EAP a declaration is attached as Appendix A to this report. The expertise of the EAP responsible for conducting the EIA is also summarized in the curriculum vitae included as part of Appendix A.

1.3 DETAILS OF SPECIALISTS

Table 1.2 provides information on the specialists that have been appointed as part of either the BA process or the original EIA process conducted in 2016. Regulation 13(1)(a) and (b) determines that an independent and suitably qualified, experienced and independent specialist should conduct the specialist study, in the event where the specialist is not independent, a specialist should be appointed to externally review the work of the specialist as contemplated in sub regulation (2), must comply with sub regulation 1. In terms of the independent status of the specialists, their declarations are attached as Appendix D to this report. The expertise of the specialists is also summarized in their respective curriculum vitae's.

Table 1.2: Details of specialists

Study	Prepared by	Contact Person	Postal Address	Tel	e-mail
Terrestrial Biodiversity, Plant and Animal Species Impact Assessment	AGES	Dr BJ Henning	PO Box 2526, Polokwane 0700	Tel: 015 291 1577	bhenning@ages-group.com
Wetland / Riparian Impact Assessment	AGES	Dr BJ Henning	PO Box 2526, Polokwane 0700	Tel: 015 291 1577	bhenning@ages-group.com
Avifaunal Impact Assessment (preliminary desktop assessment)	Agreenco	ASH Haagner	PO Box 19896 Noordbrug Potchefstroom 2522	Cell: 082 214 3738	adrian.haagner@agreencogroup.com
Heritage Screener (including archaeology and palaeontology)	CTS Heritage	Jenna Lavin	16 Edison Way, Century City, Cape town	Tel: 087 073 5739	jenna.lavin@ctsheritage.com
Visual Impact Assessment	Phala Environmental Consultants	Johan Botha	30 Fouche Street Steynsrus 9515	Tel: 082 316 7749	johan@phala-environmental.co.za

1.4 STATUS OF THE BA PROCESS

The BA process is conducted strictly in accordance with the stipulations set out in Regulations 19 – 20 and Annexure 1 of Regulation No. 326. Table 1.3 provides a summary of the BA process and future steps to be taken. It can be confirmed that to date:

- A pre-application meeting request and public participation plan was submitted on 22 July 2022 to the DFFE.
- The DFFE accepted the public participation plan in an email dated 30 July 2021.
- A site visit was conducted on 28-29 July 2021.
- An application for a Basic Assessment Process and the draft BAR was submitted on 02 August 2021.
- The draft Basic Assessment report has been made available for review and comment from August to September 2021.

It is envisaged that the BA process should be completed within approximately six months of submitting the Draft BAR, i.e. by January 2022 – see Table 1.3.

Table 1.3: Project schedule

Activity	**Prescribed timeframe**	**Timeframe**
Submit public participation plan	-	22 July 2021
Site visit	-	28-29 July 2021
Specialist reports	-	Receive by 28 July 2021
Submit application form & Draft BAR	-	02 August 2021
Public participation	30 Days	02 August – 02 September 2021
Submit Final BAR	90 Days	September 2021
Decision	107 Days	December 2021
Appeal period	20 Days	January 2022

1.5 STRUCTURE OF THE REPORT

This report is structured in accordance with the prescribed contents as stipulated in Appendix 1 of Regulation No. 326. It consists of seven sections demonstrating compliance to the specifications of the regulations as illustrated in Table 1.4.

Table 1.4: Structure of the report

Requirements for the contents of a BAR as specified in the Regulations		Section in report
Appendix 1. (3) - A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include-		
(a)	details of -	1
	(i) the EAP who prepared the report; and	
	ii) the expertise of the EAP, including a curriculum vitae.	
(b)	the location of the activity, including-	2
	(i) the 21-digit Surveyor General code of each cadastral land parcel;	
	(ii) where available, the physical address and farm name;	
	(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	
(c)	a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is-	
	(i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or	
	(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	
(d)	a description of the scope of the proposed activity, including-	
	(i) all listed and specified activities triggered and being applied for; and	
	(ii) a description of the activities to be undertaken including associated structures and infrastructure.	
(e)	a description of the policy and legislative context within which the development is proposed including:	3
	(i) An identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and	
	(ii) How the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks and instruments;	
(f)	a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	4
(g)	A motivation for the preferred site, activity and technology alternative.	5
(h)	a full description of the process followed to reach the preferred alternative within the site including –	
	(i) details of all the alternatives considered;	

	(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	
	(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them.	
	(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	
	(v) the impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	
	(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	
	(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	
	(viii) the possible mitigation measures that could be applied and level of residual risk;	
	(ix) the outcomes of the site selection matrix;	
	(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and	
	(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;	
(i)	a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including -	6
	(i) a description of all environmental issues and risks that were identified during the EIA process; and	
	(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.	
(j)	an assessment of each identified potentially significant impact and risk, including-	
	(i) cumulative impacts;	
	(ii) the nature, significance and consequences of the impact and risk;	
	(iii) the extent and duration of the impact and risk;	
	(iv) the probability of the impact and risk occurring;	
	(v) the degree to which the impact and risk can be reversed;	
	(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and	
	(vii) the degree to which the impact and risk can be mitigated;	

(k)	where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report;	6
(l)	an environmental impact statement which contains-	8
	(i) a summary of the key findings of the environmental impact assessment:	
	(ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and	
	(iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	
(m)	based on the assessment, and where applicable, impact management measures from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr;	
(n)	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Not applicable
(o)	a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;	8
(p)	a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	
(q)	where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;	Not applicable
(r)	an undertaking under oath or affirmation by the EAP in relation to-	Appendix A to the report
	(i) the correctness of the information provided in the report;	
	(ii) the inclusion of comments and inputs from stakeholders and interested and affected parties (I&APs);	
	(iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and	
	(iv) any information provided by the EAP to I&APs and any responses by the EAP to comments or inputs made by I&APs; and	
(s)	where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	Not applicable
(t)	any specific information that may be required by the CA; and	Not applicable
(u)	any other matters required in terms of section 24(4)(a) and (b) of the Act.	Not applicable

2 ACTIVITY DESCRIPTION

This section aims to address the following requirements of the regulations:

Appendix 1. (3) An BAR (...) must include-

(b) the location of the activity, including-

(i) the 21-digit Surveyor General code of each cadastral land parcel;

(ii) where available, the physical address and farm name;

(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;

(c) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is-

(i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or

(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;

(d) a description of the scope of the proposed activity, including-

(i) all listed and specified activities triggered and being applied for;

(ii) a description of the associated structures and infrastructure related to the development.

2.1 THE LOCATION OF THE ACTIVITY AND PROPERTY DESCRIPTION

The activity entails the development of a 132kV overhead power line and substation connecting the authorised Sonvanger PV Solar Power Plant to the existing Oryx-Joel 132kV power line. The grid connection corridor under assessment for the placement of the power line route and substation, and to be submitted for authorisation, is 200m wide and 22km long. It must be noted that the proposed substation will be located directly adjacent to the authorised on-site substation of the Sonvanger PV Solar Power Plant. The grid connection corridor is located directly to the west of the town of Theunissen (along the R30) and falls within the Masilonyana Local Municipality of the Lejweleputswa District Municipality, Free State Province (refer to Figure 1). It must be noted that a small portion of the corridor infringes into the Matjhabeng Local Municipality. Various properties are affected by the grid connection corridor. Refer to Figure 2 for the Regional Map of the project.

The project entails the development of an overhead long power line of approximately 22km to be constructed within a 200m wide corridor – refer to table 2.1 for general site information.

Table 2.1: General site information

Description of affected farm portions	• Afrikander Oord 80 (Portions 0* & 2) • Ebenhaeser 401 (Portions 0*, 1, 2 and 3) • Erfbloem 12 (Portions 0*, 4, 5 and 6) • Excelsior 147 (Portions 1, 2 and 3) • Goedemoed 143 (Portions 0*, 2 and 3) • Grottkau 410 (Portions 0*, 3 and 5), • Karreebooms Vallei (Portions 0*, 2, 5, 6, 7 and 8) • Leeuwbult 52 (Portions 0* and 3) • Leeuwvlei 115 (Portions 0*, 1, 2 and 3) • Mamre 566 (Portions 0*, 1, 2 and 3) • Masilo 597 (Portions 0* and 12) • Mooi Hoek 297 (Portions 0*, 1, 4 and 5) • Silesia 409 (Portions 0*, 2 and 3) • Smaldeel 262 (Portions 0*, 1, 2, 8, 20, 21, 22, 23) • Spes Bona 290 (Portions 0* and 2) • Theunissen 252 (Portions 0* and 2) • Vergelegen 85 (Portions 1, 4, 5 and 7) *Also referred to as Remaining Extent

21 Digit Surveyor General codes	• Afrikander Oord 80 (Portions 0* & 2)
	  ○ F03300000000008000000
	  ○ F03300000000008000002
	• Ebenhaeser 401 (Portions 0*, 1, 2 and 3)
	  ○ F03300000000040100000
	  ○ F03300000000040100001
	  ○ F03300000000040100002
	  ○ F03300000000040100003
	• Erfbloem 12 (Portions 0*, 4, 5 and 6)
	  ○ F03300000000012000000

	○ F03300000000001200004 ○ F03300000000001200005 ○ F03300000000001200006 • Excelsior 147 (Portions 1, 2 and 3) ○ F03300000000014700001 ○ F03300000000014700002 ○ F03300000000014700003 • Goedemoed 143 (Portions 0*, 2 and 3) ○ F03300000000014300000 ○ F03300000000014300002 ○ F03300000000014300003 • Grottkau 410 (Portions 0*, 3 and 5) ○ F03300000000041000000 ○ F03300000000041000003 ○ F03300000000041000005 • Karreebooms Vallei (Portions 0*, 2, 5, 6, 7 and 8) ○ F03300000000025800000 ○ F03300000000025800002 ○ F03300000000025800005 ○ F03300000000025800006 ○ F03300000000025800007 ○ F03300000000025800008 • Leeuwbult 52 (Portions 0* and 3) ○ F03300000000005200000 ○ F03300000000005200003 • Leeuwvlei 115 (Portions 0*, 1, 2 and 3) ○ F03300000000011500000 ○ F03300000000011500001 ○ F03300000000011500002

	○ F03300000000011500003 • Mamre 566 (Portions 0*, 1, 2 and 3) ○ F03300000000056600000 ○ F03300000000056600001 ○ F03300000000056600002 ○ F03300000000056600003 • Masilo 597 (Portions 0* and 12) ○ F03300000000059700000 ○ F03300000000059700012 • Mooi Hoek 297 (Portions 0*, 1, 4 and 5) ○ F03300000000029700000 ○ F03300000000029700001 ○ F03300000000029700004 ○ F03300000000029700005 • Silesia 409 (Portions 0*, 2 and 3) ○ F03300000000040900000 ○ F03300000000040900002 ○ F03300000000040900003 • Smaldeel 262 (Portions 0*, 1, 2, 8, 20, 21, 22, 23) ○ F03300000000026200000 ○ F03300000000026200001 ○ F03300000000026200002 ○ F03300000000026200008 ○ F03300000000026200020 ○ F03300000000026200021 ○ F03300000000026200022 ○ F03300000000026200023 • Spes Bona 290 (Portions 0* and 2) ○ F03300000000029000000

	○ F03300000000029000002 • Theunissen 252 (Portions 0* and 2) ○ F03300000000025200000 ○ F03300000000025200002 • Vergelegen 85 (Portions 1, 4, 5 and 7) ○ F03300000000008500001 ○ F03300000000008500004 ○ F03300000000008500005 ○ F03300000000008500007
Photographs of the site	Refer to the Plates
Type of technology	132 kV single-circuit overhead power line
Structure Height	Power lines ~32m
Length of the power line	Approximately 22km
Grid connection corridor width	Approximately 200m
Substation capacity	132kV
Substation footprint	1 hectare
Servitude width	Approximately 31m
Surface area to be covered	Less than 70 hectares

The grid connection corridor is located directly to the west of the town of Theunissen (along the R30 Regional Road), which is in a rural area and characterised by farms, the urban area of Theunissen, linear infrastructure (i.e. roads) and mining activities which includes the Sibanye Stillwater Beatrix Mine. The site survey revealed that the site is currently used for grazing for cattle, maize cultivation and mining activities – refer to plates 1-10 for photographs of the grid connection corridor.

2.2 ACTIVITY DESCRIPTION

The proposed development will trigger the following activity:

Table 2.2: Listed activities

Relevant notice:	**Activity No (s)**	**Description of each listed activity as per project description**:
GNR. 327, 07 April 2017	Activity 11(i)	• *"The development of facilities or infrastructure for the transmission and distribution of electricity (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts."* • The development of a 132kV single-circuit power line (and 132kV substation) is required to enable the connection of the authorised Sonvanger Photovoltaic Solar Power Plant (DFFE ref.: 14/12/16/3/3/2/672) to the national grid network. A 200m wide and 22km long grid connection corridor is being assessed for the placement of the power line route and substation. The 132kV power line is proposed to connect into the existing Eskom Oryx-Joel 132kV Power Line.
GNR. 327, 07 April 2017	Activity 12(ii)(a)(c)	• *"The development of (ii) infrastructure or structures with a physical footprint of 100 square meters or more (a) within a watercourse or (b) within 32 meters of a watercourse, measured from the edge of a watercourse."* • The power line requires the development of a service road and pylon infrastructure which will exceed 100 square meters in extent. Surface water features, including wetlands and drainage channels, are present within the grid connection corridor that will need to be crossed by the service road.
GNR. 327, 07 April 2017	Activity 19	• *"The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil sand, shells, shell grit, pebbles or rock of more than 10 cubic meters from a watercourse"* • The power line requires the development of a service road. Surface water features, including wetlands and drainage channels, are present within the grid connection corridor that will need to be crossed by the service road. This will require the removal and moving of soils of more than 10 cubic meters.

GNR. 327, 07 April 2017	Activity 27	• *"The clearance of 1 hectares or more, but less than 20 hectares of indigenous vegetation."* • The development of the 132kV substation proposed as part of the project will require the clearance of 1 hectare of indigenous vegetation.
GNR. 324, 07 April 2017	Activity 4(b)(i)(bb)(ee)	• *"The development of a road wider than 4 meters with a reserve less than 13,5m (b) in the Free State Province (i) outside urban areas within (ee) Critical Biodiversity Areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans."* • The power line will require a service road of ~4m in width. The grid connection corridor infringes on areas identified as being CBA 1 as per the 2015 Free State Biodiversity Plan.
GNR. 324, 07 April 2017	Activity 12(b)(i)(ii)(vi)	• *"The clearance of an area of 300 square meters or more of indigenous vegetation in the (b) Free State (i) within critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA, or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004, (ii) within critical biodiversity areas identified in bioregional plans and (iv) areas within a watercourse or wetland, or within 100 metres from the edge of a watercourse or wetland."* • The power line, substation and the associated service road will require more than 300 square meters of vegetation clearance. The grid connection corridor infringes on areas identified as Vaal-Vet Sandy Grassland which is classified as Endangered and areas identified as being CBA 1 as per the 2015 Free State Biodiversity Plan. Surface water features, including wetlands and drainage channels, are present within the grid connection corridor that will need to be crossed by the service road.
GNR. 324, 07 April 2017	Activity 14(ii)(a) (c)(b)(i)(ff)	• "*The development of (ii) infrastructure or structures with a physical footprint of 10 square metres or more, where such development occurs (a) within a watercourse, or (c) within 32 meters of a watercourse, measure from the edge of a watercourse, within (b) the Free State, (i) outside urban areas, within (ff) critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans."*

		• The power line requires the development of a service road and pylon infrastructure which will exceed 10 square meters in extent. Surface water features, including wetlands and drainage channels, are present within the grid connection corridor that will need to be crossed by the service road. The grid connection corridor infringes on areas identified as CBA 1 as per the 2015 Free State Biodiversity Plan

2.3 ACTIVITIES ASSOCIATED WITH THE POWER LINE

For the Sonvanger Photovoltaic Solar Power Plant to connect to the electrical grid requires transformation of the voltage from 480V to 33kV to 132kV. The normal components and dimensions of a distribution rated electrical substation will be required. Output voltage from the inverter is 480V and this is fed into step up transformers to 132kV. A substation has been authorised to step the voltage up to 132kV, after which the power will be evacuated into the national grid via the new proposed substation and the power line. Following an application to Eskom for a Cost Estimate Letter (CEL), the Applicant was advised by Eskom that the existing Oryx-Joel 132kV power line (located near the Beatrix Mine north of Theunissen) is the feasible connection point, as detailed in the CEL provided by Eskom.

- <u>Construction Phase:</u>

  The proposed 132 kV overhead power line will be approximately 22km long and will be constructed within the identified grid connection corridor. The minimum vertical clearance to buildings, poles and structures not forming part of the power line must be 3.8m, while the minimum vertical clearance between the conductors and the ground is 6.7m. The minimum distance between trees and shrubs and any bare phase conductor of a 132kV power line must be 4m, allowing for the possible sideways movement and swing of both the power line conductor and the tree or shrub. The structure to be utilised for the power line towers will be informed by the local geotechnical and topographical conditions as well as by specific requirements from Eskom.

  The construction of the proposed overhead power line and substation will take approximately 12 months to complete. Following the Commercial Operation Date (COD) of the authorised Songvanger PV SPP, the applicant will hand over the powerline and the associated infrastructure (i.e. substation and service road) to Eskom Holdings SOC Ltd (Eskom) to operate and maintain. This is in line with Eskom's well-established Self Build Grid Connection Strategy for Renewable Energy Projects developed under the REIPPP Procurement Programme.

- <u>Operation Phase:</u>

  The proposed power line and associated servitude will require routine maintenance throughout the operation period.

- Decommissioning Phase:

  The photovoltaic solar power plant has a lifespan of between 20 and 30 years from where the facility and its associated infrastructure will be decommissioned or upgraded. If the solar plant is not decommissioned the power line is expected to have a lifespan of more than 40 years (with maintenance) and the infrastructure will only be decommissioned once it has reached the end of life, or if no longer required. Upon decommissioning, the power line would be disassembled, and the components removed from site, and recycled where possible, in line with the Environmental Management Programme (EMPr).

2.4 LAYOUT DESCRIPTION

The grid connection corridor follows the limitations of the site and aspects such as environmentally sensitive areas, roads, fencing and servitudes – refer to Figure 8 below. The total surface area proposed for the power line route is approximately 70 hectares in extent. The proposed route of the power line is the shortest route from the authorised on-site substation to the existing Oryx-Joel 132kV power line and is the preferred alternative for the developers based on the route following the R30 regional road. This route also provides an opportunity for the consolidation of linear disturbance and infrastructure in the affected landscape. A final layout plan is included as Figure 3 in the report.

Figure 8: Proposed 200m power line corridor being assessed for authorisation

Table 2.3 provides the coordinate points for the proposed power line corridor which is being put forward for Environmental Authorisation.

Table 2.3: Coordinates

Coordinates			
Power Line	A	28°25'21.78"S	26°41'7.89"E
	B	28°24'5.32"S	26°41'41.91"E
	C	28°23'53.76"S	26°41'51.30"E
	D	28°23'28.30"S	26°42'50.54"E
	E	28°23'24.17"S	26°42'54.50"E
	F	28°20'32.37"S	26°43'54.73"E
	G	28°17'1.03"S	26°45'39.83"E
	H	28°16'55.66"S	26°45'40.18"E
	I	28°16'11.59"S	26°45'34.59"E
	J	28°16'5.72"S	26°45'39.67"E
	K	28°16'1.42"S	26°46'9.18"E
	L	28°16'1.71"S	26°46'34.13"E
	M	28°16'2.35"S	26°46'36.72"E
	N	28°15'51.02"S	26°47'1.39"E
	O	28°15'56.66"S	26°47'4.66"E
	P	28°16'9.34"S	26°46'37.30"E
	Q	28°16'8.19"S	26°46'33.00"E
	R	28°16'7.93"S	26°46'9.85"E
	S	28°16'12.22"S	26°45'41.84"E
	T	28°16'55.76"S	26°45'47.40"E
	U	28°17'1.97"S	26°45'46.90"E
	V	28°20'36.19"S	26°44'0.98"E
	W	28°23'27.85"S	26°43'0.79"E
	X	28°23'32.90"S	26°42'55.59"E
	Y	28°23'57.89"S	26°41'56.92"E
	Z	28°24'8.11"S	26°41'48.24"E
	AA	28°25'24.68"S	26°41'14.47"E

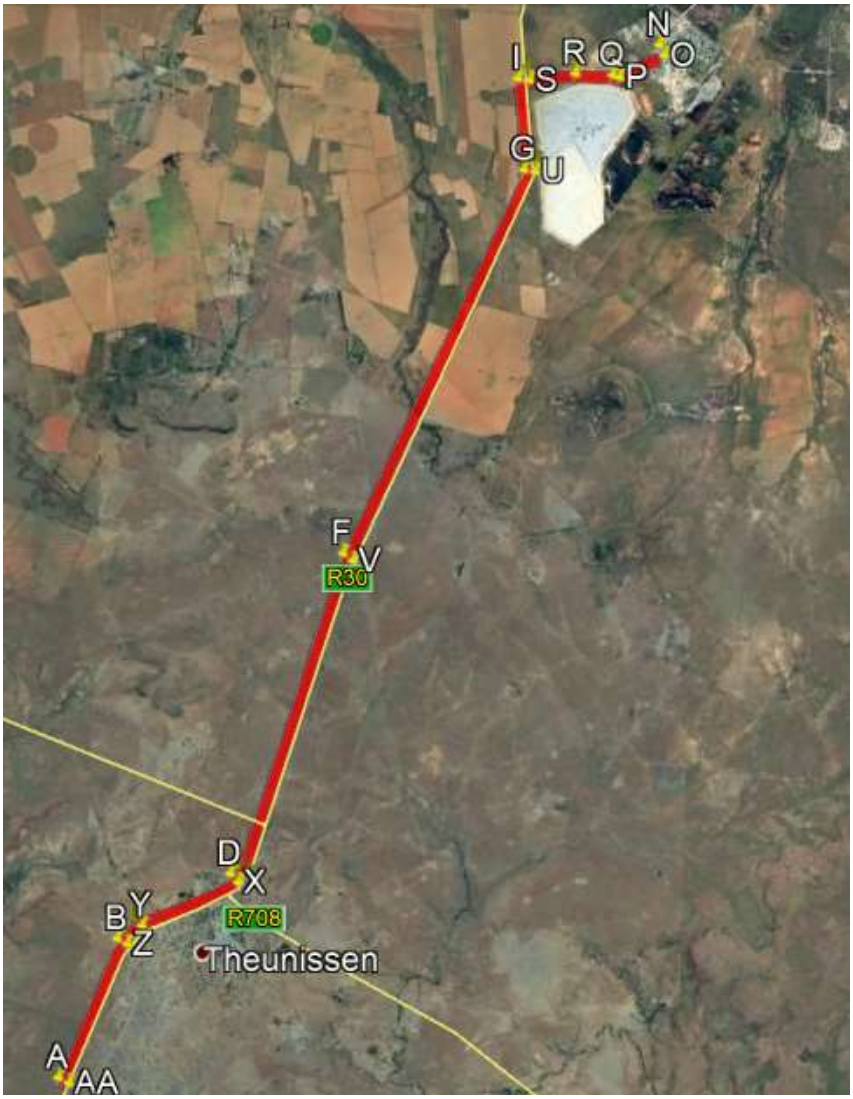

Figure 9: Map indicating coordinate points as related to Table 2.3 above

2.5 SERVICES PROVISION

The following sections provides information on services required on the site e.g. water, sewage, refuse removal, and electricity.

2.5.1 Water

Adequate provision of water will be a prerequisite for the development. Water for the proposed development will most likely be obtained from ground water resources, or alternatively from the local municipality. The Local Municipality has issued a letter confirming that they are able to provide water for the construction and operation phases of the development. The Department of Water and Sanitation has been asked to confirm the water resource availability in the relevant catchment management area in order to ensure sustainable water supply. The EAP has appointed a Wetland / Riparian Impact Assessment Specialist as part of the team. Part of this Basic Assessment process will be to determine if there are further water use authorisation (WUA) required for the power line, substation and service road. A WUA application will be

submitted to the Department of Water and Sanitation and in line with DWS's procedure for similar projects, an assessment of the application for water use authorisation will only be finalised in the event that the project proponent has been appointed as a preferred bidder by the Department of Mineral Resources and Energy (DMRE).

The grid connection corridor is located within the C41G, C41H and C42K quaternary catchments and is situated in the Middle Vaal Water Management Area. Drainage occurs as sheet-wash into the drainage channels within the corridor that eventually drains into the major river namely the Palmietkuil Spruit and Bosluis Spruit that occurs along the periphery of the corridor as well as the Krom Spruit to the south-east of the corridor.

Drinking water supplied will comply with the SANS:241 quality requirements and it is noted that the Masilonyana Local Municipality remains the Water Service Authority in that area of jurisdiction. Water saving devices and technologies such as the use of dual flush toilets and low-flow taps, the management of storm water, the capture and use of rainwater from gutters and roofs would be considered by the developer. Furthermore, indigenous vegetation will be used during landscaping and the staff will be trained to implement good housekeeping techniques.

2.5.2 Storm water

To avoid soil erosion, it is recommended that the clearing of vegetation be limited. Storm water management and mitigation measures are included in the Environmental Management Programme (EMPr) – refer to Appendix F.

2.5.3 Sanitation and waste removal

Portable chemical toilets will be utilized, that will be serviced privately or by the local municipality. Waste will be disposed at a licensed landfill site. The construction- and hazardous waste will be removed to licensed landfill sites accepting such kinds of wastes. During the operational phase household waste will be removed to a licensed landfill site by a private contractor or by the local municipality.

2.6 Decommissioning of the facility

The operating period will be 20 years from the commencement date. Thereafter two rights of renewal periods of 40 years and 20 years will be relevant. It is anticipated that new PV technologies and equipment will be implemented, within the scope of the Environmental Authorisation, when influencing the profitability of the solar facility. The implementation of new technologies and equipment at the solar power plant, which the power line will cater for, will also then extend the operation of the power line.

A likely extension of the plant's lifetime would involve putting new, more efficient, solar panels on the existing structures. If, for whatever reason the plant halts operations, the Environmental Authorisation and contract with the landowner will be respected during the decommissioning phase.

The rehabilitation of the site would form part of the decommissioning phase. The aim would be to restore the land to its original form (or as close as possible). The rehabilitation activities would include the following:

- Removal of all structures and rubble;
- Breaking up compaction where required, loosening of the soil and the redistribution of topsoil; and
- The surface will be restored to the original contours and hydro seeding will take place.

3 LEGISLATIVE AND POLICY CONTEXT

This section aims to address the following requirements of the regulations:

Appendix 1. (3) An BAR (...) must include-

(e) a description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context.

3.1 INTRODUCTION

Environmental decision making with regards to solar PV plants and associated infrastructure (including the associated grid connection infrastructure) is based on numerous policy and legislative documents. These documents inform decisions on project level environmental authorisations issued by the National Department of Forestry, Fisheries and the Environment (DFFE) as well as comments from local and district authorities. Moreover, it is significant to note that they also inform strategic decision making reflected in IDPs and SDFs. Therefore, to ensure streamlining of environmental authorisations it is imperative for the proposed activity to align with the principles and objectives of key national, provincial and local development policies and legislation. The following acts and policies and their applicability to the proposed development are briefly summarised:

- The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)
- National Environmental Management Act, 1998 (Act No. 107 of 1998) [NEMA]
- The National Energy Act, 2008 (Act 34 of 2008)
- National Water Act, 1998 (Act No. 36 of 1998)
- National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
- National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
- The National Heritage Resources Act, 1999 (Act No. 25 of 1999)
- Conservation of Agricultural Resources Act, 1983 (Act No. 85 of 1983)
- The National Forests Act, 1998 (Act 84 of 1998)
- Free State Nature Conservation Ordinance, 1969 (Act 8 of 1969)
- The White Paper on the Energy Policy of the Republic of South Africa (1998)
- The White Paper on Renewable Energy (2003)
- Integrated Resource Plan (IRP) for South Africa (2010-2030)
- National Development Plan of 2030
- National Infrastructure Plan of South Africa

- New Growth Path Framework
- Strategic Environmental Assessment (SEA) for wind and solar PV Energy in South Africa (2014)
- Free state Provincial Spatial Development Framework (PSDF) (2012)
- Lejweleputswa District Municipality Integrated Development Plan for 2019 – 2020
- Masilonyana Local Municipality Integrated Development Plan for 2019 – 2020

Based on the fact that the proposed power line is necessary grid infrastructure for the operation of an authorised solar power plant, the legislative and policy documents of the solar power plant are also deemed relevant to the proposed power line.

The key principles and objectives of each of the legislative and policy documents are briefly summarised in tables 3.1 and 3.2 to provide a reference framework for the implications for the proposed activity.

3.2 LEGISLATIVE CONTEXT

Table 3.1: Legislative context for the construction of photovoltaic solar plants and the associated grid connection infrastructure

LEGISLATION	ADMINISTERING AUTHORITY	DATE	SUMMARY / IMPLICATIONS FOR PROPOSED DEVELOPMENT
The Constitution of South Africa (Act No. 108 of 1996)	National Government	1996	The Constitution is the supreme law of the Republic and all law and conduct must be consistent with the Constitution. The Chapter on the Bill of Rights contains a number of provisions, which are relevant to securing the protection of the environment. Section 24 states that "everyone has the right to (a) an environment that is not harmful to their health or well-being and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that – (i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. The Constitution therefore, compels government to give effect to the people's environmental right and places government under a legal duty to act as a responsible custodian of the country's environment. It compels government to pass legislation and use other measures to protect the environment, to prevent pollution and ecological degradation, promote conservation and secure sustainable development.
The National Environmental Management Act (Act No. 107 of 1998)	National and Provincial Department of Forestry, Fisheries and the Environment	1998	NEMA provides for co-operative governance by establishing principles and procedures for decision-makers on matters affecting the environment. An important function of the Act is to serve as an enabling Act for the promulgation of legislation to effectively address integrated environmental management. Some of the principles in the Act are accountability; affordability; cradle to grave management; equity; integration; open information; polluter pays; subsidiary; waste avoidance and minimisation; co-operative governance; sustainable development; and environmental protection and justice. The mandate for EIA lays with the National Environmental Management Act (107 of 1998) and the EIA Regulations No. 982, 983, 984, and 985 promulgated in terms of Section 24 of NEMA. The EIA Regulations determine that an Environmental Authorisation is required for certain

			listed activities, which might have a detrimental effect on the environment. This BA was triggered by Activity 11(i) listed in Regulation 326 which requires a 'basic assessment process.'
The National Energy Act (Act No. 34 of 2008)	Department of Mineral Resources and Energy	2008	One of the objectives of the National Energy Act was to promote diversity of supply of energy and its sources. In this regard, the preamble makes direct reference to renewable resources, including solar: "To ensure that diverse energy resources are available, in sustainable quantities, and at affordable prices, to the South African economy, in support of economic growth and poverty alleviation, taking into account environmental management requirements (…); to provide for (…) increased generation and consumption of renewable energies…" (Preamble).
The National Water Act (Act No. 36 of 1998)	Department of Water and Sanitation (DWS)	1998	Sustainability and equity are identified as central guiding principles in the protection, use, development, conservation, management and control of water resources. The intention of the Act is to promote the equitable access to water and the sustainable use of water, redress past racial and gender discrimination, and facilitate economic and social development. The Act provides the rights of access to basic water supply and sanitation, and environmentally, it provides for the protection of aquatic and associated ecosystems, the reduction and prevention of pollution and degradation of water resources. As this Act is founded on the principle that National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest, a person can only be entitled to use water if the use is permissible under the Act. Chapter 4 of the Act lays the basis for regulating water use. The relevant water uses, as required for the development, will be applied for with the Department of Water and Sanitation in order to obtain the relevant water use licensing.
National Environmental Management: Waste Act (Act No. 59 of	Department of Forestry, Fisheries and the Environment (DFFE)	2008	NEMWA has been developed as part of the law reform process enacted through the White Paper on Integrated Pollution and Waste Management and the National Waste Management Strategy (NWMS). The objectives of the Act relate to the provision of measures to protect health, well-being and the environment, to ensure that people are aware of the impact of waste on their health, well-being and the environment, to provide for compliance with the

2008)			measures, and to give effect to section 24 of the Constitution in order to secure an environment that is not harmful to health and well-being. Regulations No. R921 (of 2013) promulgated in terms of Section 19(1) of the National Environmental Management: Waste Act (59 of 2008) determine that no person may commence, undertake or conduct a waste management activity listed in this schedule unless a license is issued in respect of that activity. It is not envisaged that a waste permit will be required for the proposed development.
National Environment Management: Air Quality Act (Act No. 39 of 2004)	Department of Forestry, Fisheries and the Environment (DFFE)	2004	The object of this Act is to protect the environment by providing reasonable measures for the protection and enhancement of the quality of air in the Republic; the prevention of air pollution and ecological degradation; and securing ecologically sustainable development while promoting justifiable economic and social development. Regulations No. R248 (of 31 March 2010) promulgated in terms of Section 21(1)(a) of the National Environmental Management Act: Air Quality Act (39 of 2004) determine that an Atmospheric Emission License (AEL) is required for certain listed activities, which result in atmospheric emissions which have or may have a detrimental effect on the environment. The Regulation also sets out the minimum emission standards for the listed activities. It is not envisaged that an Atmospheric Emission License will be required for the proposed development.
The National Heritage Resources Act (Act No. 25 of 1999)	South African Heritage Resources Agency (SAHRA) and the Free State Provincial Heritage Resources Authority	1999	The Act aims to introduce an integrated and interactive system for the management of the heritage resources, to promote good government at all levels, and empower civil society to nurture and conserve heritage resources so that they may be bequeathed to future generations and to lay down principles for governing heritage resources management throughout the Republic. It also aims to establish the South African Heritage Resources Agency together with its Council to co-ordinate and promote the management of heritage resources, to set norms and maintain essential national standards and to protect heritage resources, to provide for the protection and management of conservation-worthy places and areas by local authorities, and to provide for matters connected therewith.

			The Act protects and manages certain categories of heritage resources in South Africa. For the purposes of the Heritage Resources Act, a "heritage resource" includes any place or object of cultural significance. In this regard the Act makes provision for a person undertaking an activity listed in Section 28 of the Act to notify the resources authority. The resources authority may request that a heritage impact assessment be conducted if there is reason to believe that heritage resources will be affected. A case file has been opened on SAHRIS and all relevant documents were submitted for their comments and approval. A Heritage Screening study has been undertaken for the grid connection corridor.
Conservation of Agricultural Resources Act (Act No. 85 of 1983)	National and Provincial Government	1983	The objective of the Act is to provide for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith. Consent will be required from the Department of Agriculture in order to confirm that the proposed development is not located on high potential agricultural land and to approve the long term lease agreement.
The National Forests Act, 1998 (Act 84 of 1998)	Department of Forestry, Fisheries and the Environment (DFFE)	1998	The purposes of this Act are to: (a) promote the sustainable management and development of forests for the benefit of all; (b) create the conditions necessary to restructure forestry in State forests; (c) provide special measures for the protection of certain forests and trees: (d) promote the sustainable use of forests for environmental, economic, educational, recreational, cultural, health and spiritual purposes. (e) promote community forestry; (f) promote greater participation in all aspects of forestry and the forest products industry by persons disadvantaged by unfair discrimination. Section 12(1) read with s15(1) of the NFA stated that the Minister may declare a particular tree, group of trees, woodland; or trees belonging to a particular species, to be a protected

			tree, group of trees, woodland or species. A list of protected tree species was gazetted in GN 635 of 6 December 2019. The effect of the declaration is that no person may (a) cut, disturb, damage or destroy; or (b) possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, or any forest product derived from a protected tree, except under a license granted by the Minister; or in terms of an exemption published by the Minister in the Gazette.
Free State Nature Conservation Ordinance, 1969 (Act 8 of 1969)	Free State Province Department of Economic, Small Business Development, Tourism and Environmental Affairs (DESTEA)	1969	The Act provides for the conservation of fauna and flora and the hunting of animals causing damage and for matters incidental thereto. This includes wild animals, fish, indigenous plants, as well as nature reserves. The Act also provides for the permitting of the disturbance of such species. A Terrestrial Biodiversity, Plant and Animal Impact Assessment has been undertaken for the proposed power line and is included in Appendix D1 of this BAR.

3.3 POLICY CONTEXT

Table 3.2: Policy context for the construction of solar PV plants and the associated grid connection infrastructure

POLICY	ADMINISTERING AUTHORITY	DATE	SUMMARY / IMPLICATIONS FOR PROPOSED DEVELOPMENT
The White Paper on the Energy Policy of the Republic of South Africa	Department of Mineral Resources and Energy	1998	The White Paper on the Energy Policy of the Republic of South Africa establishes the international and national policy context for the energy sector, and identifies the following energy policy objectives: • Increasing access to affordable energy services • Improving energy governance • Stimulating economic development • Managing energy-related environmental and health impacts • Securing supply through diversity • Energy policy priorities

			The White Paper sets out the advantages of renewable energy and states that Government believes that renewables can in many cases provide the least cost energy service, particularly when social and environmental costs are included. The White Paper acknowledges that South Africa has neglected the development and implementation of renewable energy applications, despite the fact that the country's renewable energy resource base is extensive and many appropriate applications exist. The White Paper notes that renewable energy applications have specific characteristics that need to be considered. Advantages include: • Minimal environmental impacts in operation in comparison with traditional supply technologies; and • Generally lower running costs, and high labour intensities. Disadvantages include: • Higher capital costs in some cases; • Lower energy densities; and • Lower levels of availability, depending on specific conditions, especially with sun and wind based systems.
The White Paper on Renewable Energy	Department of Mineral Resources and Energy	2003	This White Paper on Renewable Energy supplements the *White Paper on Energy Policy*, which recognizes that the medium and long-term potential of renewable energy is significant. This Paper sets out Government's vision, policy principles, strategic goals and objectives for promoting and implementing renewable energy in South Africa. The White Paper notes that while South Africa is well-endowed with renewable energy resources that have the potential to become sustainable alternatives to fossil fuels, these have thus far remained largely untapped. Government's long-term goal is the establishment of a renewable energy industry producing modern energy carriers that will offer in future years a sustainable, fully non-subsidised alternative to fossil fuels. The medium-term (10-year) target set in the White Paper is: *10 000 GWh (0.8 Mtoe) renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, wind, solar and small-scale hydro. The renewable energy is to be utilised for power generation*

			and non-electric technologies such as solar water heating and bio-fuels. This is approximately 4% (1667 MW) of the projected electricity demand for 2013 (41539 MW) (Executive Summary, ix).
Integrated Resource Plan (IRP) for South Africa	Department of Mineral Resources and Energy	2010-2030	The Integrated Resource Plan for Electricity for South Africa of 2010–2030 (further referred to as the IRP) is a "living plan" which is expected to be revised and updated continuously as necessary due to changing circumstances. According to the Summary of the plan the current IRP for South Africa, which was originally initiated by the Department of Energy (DoE) in June 2010, led to the Revised Balanced Scenarios (RBS) for the period 2010–2030. "*This scenario was derived based on the cost-optimal solution for new build options (considering the direct costs of new build power plants), which was then "balanced" in accordance with qualitative measures such as local job creation". In addition to all existing and committed power plants, the RBS included 11,4 GW of renewables, which relates to the proposed Tirisano SEF. In 2010 several changes were made to the IRP model. The main changes in the IRP were the disaggregation of renewable energy technologies to explicitly display solar photovoltaic (PV), concentrated solar power (CSP), and wind options"* (RSA, 2011a). The summary of the IRP further explains that traditional cost-optimal scenarios were developed based on the previously mentioned changes in the IRP. This resulted in the Policy-Adjusted IRP, which stated that: "*The installation of renewables (solar PV, CSP and wind) have been brought forward in order to accelerate a local industry*; *To account for the uncertainties associated with the costs of renewables and fuels, a nuclear fleet of 9,6 GW is included in the IRP;* *The emission constraint of the RBS (275 million tons of carbon dioxide per year after 2024) is maintained; and* *Energy efficiency demand-side management (EEDSM) measures are maintained at the level of the RBS*" (RSA, 2011a:6). *"The Policy-Adjusted IRP includes the same amount of coal and nuclear new builds as the RBS, while reflecting recent developments with respect to prices for renewables. In addition to all existing and*

committed power plants (including 10 GW committed coal), the plan includes 9,6 GW of nuclear; 6,3 GW of coal; 17,8 GW of renewables; and 8,9 GW of other generation sources" (RSA, 2011a:6).

The IRP highlights the commitments before the next IRP. The commitments pertaining to the purpose of the proposed project in renewable energy is:

"*Solar PV programme 2012-2015: In order to facilitate the connection of the first solar PV units to the grid in 2012 a firm commitment to this capacity is necessary. Furthermore, to provide the security of investment to ramp up a sustainable local industry cluster, the first four years from 2012 to 2015 require firm commitment."*

"*Solar PV 2016 to 2019: As with wind, grid upgrades might become necessary for the second round of solar PV installations from 2016 to 2019, depending on their location. To trigger the associated tasks in a timely manner, a firm commitment to these capacities is necessary in the next round of the IRP at the latest. By then, the assumed cost decreases for solar PV will be confirmed*" (IRP, 2011a:17).

In conclusion the IRP recommends that an accelerated roll-out in renewable energy options should be allowed with regards to the benefits of the localization in renewable energy technologies (RSA, 2011a). It is however important to take note that since the release of the IRP in 2011 there has been a number of developments in the energy sector of South Africa. Therefore, the IRP has been updated and were open for comments until March of 2017. The new IRP of 2019 was formally published in October 2019. The draft IRP of 2018 was open for comments until the end of October 2018. For the revision scenario analysis were conducted and the results thereof are included in the draft IRP of 2018. The results revealed that for the period ending 2030 that: *"The committed Renewable Energy Independent Power Producers Programme, including the 27 signed projects and Eskom capacity rollout ending with the last unit of Kusile in 2022, will provide more than sufficient capacity to cover the projected demand and decommissioning of plants up to approximately 2025"; "Imposing annual build limits on renewable energy will not affect the total cumulative capacity and the energy mix for the period up to 2030*"; and *"the scenario without renewable energy annual build limits provides the least-cost option by 2030*" (RSA,

			2018:34). Lastly, the draft IRP of 2018 also included the scenario analysis for the period post 2030. Here it was observed that: "*Imposing annual build limits on renewable energy will restrict the cumulative renewable installed capacity and the energy mix for this period; adopting no annual build limits on renewables or imposing a more stringent strategy to reduce greenhouse gas emissions implies that no new coal power plants will be built in the future unless affordable cleaner forms of coal-to-power are available; and the scenario without renewable energy annual build limits provides the least-cost option by 2050*" (RSA, 2018:34–35). In the final IRP of 2019 key considerations were taken into consideration together with required actions to be taken for the IRP of 2019 to be credible. In terms of renewable energy technologies like solar and wind, the IRP stated that *"The application of renewable build limits 'smoothes out' the capacity allocations for wind and solar PV which provides a constant pipeline of projects to investment; this addresses investor confidence*". The decision stated against this key consideration is to *"retain the current annual build limits on renewables (wind and PV) pending the finalization of a just transition plan"* (RSA, 2019:46). Hereby the IRP also recognizes renewable technologies' potential to diversify the electricity mix, create new industries and job opportunities and localize across the value chain (RSA, 2019:13).
National Development Plan of 2030	The Presidency: National Planning Commission	-	The National Development Plan aims to "eliminate poverty and reduce inequality by 2030" (RSA, undated). In order to eliminate or reduce inequality, the economy of South Africa needs to grow faster in order to benefit all South Africans. In May 2010 a draft national development plan was drafted, which highlighted the nine (9) key challenges for South Africa. The highest priority areas according to the plan are considered to be the creation of employment opportunities and to improve the quality of national education. In this regard, the plan sets out three (3) priority areas, namely to raise employment by a faster growing economy, improve the quality of education, and to build the capability of the state in order to play a more developmental and transformative role. One of the key challenges identified was that the economy is unsustainably resource intensive and the acceleration and expansion of renewable energy was identified as a key intervention strategy to address this challenge.

National Infrastructure Plan of South Africa	Presidential Infrastructure Coordinating Commission	2012	In the year 2012 the South African Government adopted a National Infrastructure Plan (hereafter referred to as the Plan). The aim of this Plan is to transform the economic landscape, while strengthening the delivery of basic services and creating new employment opportunities. This Plan also supports the integration of African communities, and also sets out the challenges and enablers that our country needs in order to respond to the planning and development of infrastructure with regards to fostering economic growth (RSA, 2012). The Plan has developed eighteen (18) strategic integrated projects (further referred to as SIPs). These SIPs stretches over all nine (9) provinces, covering social and economic infrastructure, and projects that enhances development and growth. Of the eighteen (18), five (5) are geographically focused, three (3) spatial, three (3) energy, three (3) social infrastructure, two (2) knowledge, one (1) regional integration, and one (1) water and sanitation focussed. The three (3) SIPs according to the Plan, which are energy focused and correlate to the proposed project (including the solar power plant which the power line is required to cater for) are as follow: • SIP 8: Green energy in support of the South African economy; • SIP 9: Electricity generation to support socio-economic development; and • SIP 10: Electricity transmission and distribution for all. SIP 8 according to the Plan "*support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the IRP 2010 and support bio-fuel production facilities*". The purpose of SIP 9 according to the Plan is to "*accelerate the construction of new electricity generation capacity in accordance with the IRP 2010 to meet the needs of the economy and address historical imbalances*". SIP 9 should also monitor the implementation of major projects such as new power stations like Medupi, Kusile and Ingula. Lastly, SIP 10's aim is to "*expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development*" (RSA, 2012:20).

New Growth Path Framework	Department of Economic Development	-	The New Growth Path was developed after 16 years of South Africa's democracy, to respond to emerging opportunities and risks while building on policies. This framework provides a dynamic vision on how to collectively achieve a more developed, equitable and democratic society and economy. This framework mainly reflects the commitment of the South African Government to create employment opportunities for its people in all economic policies (RSA, 2011b). This framework sets out the markers for job creation and growth and also identify where there are viable changes in the character and structure of production, in order to create a more inclusive, greener economy on the long-term. It is stated in the framework that in order for this framework to reach its objectives, the Government is committed to: • Identify the possible areas of employment creation; and • Develop a policy to facilitate employment creation especially with regards to social equity, sustainable employment and growth in the creation of employment activities (RSA, 2011b). This framework also identifies investments in five key areas, one of which is energy. This framework also states that the green economy is a priority area, which includes the construction and investment of renewable energy technologies like solar (RSA, 2011b). In this regard it will also assist creating employment opportunities over the medium- and long-term.
Strategic Environmental Assessment (SEA) for wind and solar PV Energy in South Africa	Department of Forestry, Fisheries and the Environment	2014	The Department of Environmental Affairs (DEA) (now referred to as the DFFE) has committed to contribute to the implementation of the National Development Plan and National Infrastructure Plan by undertaking Strategic Environmental Assessments (SEAs) to identify adaptive processes that integrate the regulatory environmental requirements for Strategic Integrated Projects (SIPs) while safeguarding the environment. The wind and solar photovoltaic (PV) SEA was accordingly commissioned by DEA in support of SIP 8, which aims to facilitate the implementation of sustainable green energy initiatives. This SEA identifies areas where large scale wind and solar PV energy facilities can be developed in terms of SIP 8 and in a manner that limits significant negative impacts on the environment, while yielding the highest possible socio-economic benefits to the country. These areas are referred to as Renewable

			Energy Development Zones (REDZs). The REDZs also provide priority areas for investment into the electricity grid. Currently one of the greatest challenges to renewable energy development in South Africa is the saturation of existing grid infrastructure and the difficulties in expanding the grid. Proactive investment in grid infrastructure is thus likely to be the most important factor determining the success of REDZs. Although it is intended for the SEA to facilitate proactive grid investment in REDZs, such investment should not be limited to these areas. Suitable wind and solar PV development should still promoted across the country and any proposed development must be evaluated on its own merit. The proposed site does not fall within a REDZs.
Free State Provincial Spatial Development Framework (PSDF)	Free State Provincial Government	2012	The Free State PSDF is a policy document that promotes a 'developmental state' in accordance with national and provincial legislation and directives. It aligns with the Free State Provincial Growth and Development Strategy which has committed the Free State to 'building a prosperous, sustainable and growing provincial economy which reduces poverty and improves social development'. The PSDF includes comprehensive plans and strategies that collectively indicate which type of land-use should be promoted in the Province, where such land-use should take place, and how it should be implemented and managed. In broad terms, the PSDF: • Indicates the spatial implications of the core development objectives of the Free State Provincial Growth and Development Strategy. • Serves as a spatial plan that facilitates local economic development. • Lays down strategies, proposals and guidelines as it relates to sustainable development. • Facilitates cross-boundary co-operation between municipalities, adjoining provinces, and bordering countries. • Serves as a manual for integration and standardisation of the planning frameworks of all spheres

			of government in the Province. The Free State Provincial Growth and Development Strategy states that sustainable economic development is the only effective means by which the most significant challenge of the Free State, namely poverty, can be addressed is. The PSDF gives practical effect to sustainable development, which is defined as development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. The PSDF is prepared in accordance with bioregional planning principles that were adapted to suit the site-specific requirements of the Free State. It incorporates and complies with the relevant protocols, conventions, agreements, legislation and policy at all applicable levels of planning, ranging from international to the local level. The PSDF builds upon achievements and learns from mistakes of the past, reacts to the challenges, incorporates the traditional knowledge of the people of the Free State, and builds upon international best-practice and technology. The development of the Sonvanger Photovoltaic Solar Power Plant and the proposed power line are in-line with the framework based on the contributions and opportunities presented by a development of this nature.
Lejweleputswa District Municipality Integrated Development Plan (IDP)	Lejweleputswa District Municipality	2021-2022	The long-term vision of the Lejweleputswa DM is to be: "A leader in sustainable development and service delivery to all". The above stated vision defines what Lejweleputswa District Municipality would like to attain over medium to long-term, and for that achievement to effectively materialize, their mission is: "Providing sound financial management. Providing excellent, vibrant public participation and high quality local municipal support programmes, maintaining good working relations in the spirit of co-operative governance, and enhancing high staff morale, productivity and motivation". Of the eighteen (18) SIPs that are contained in the National Infrastructure Plan (NIP), there are eight which impacts on the Lejweleputswa DM and thus need to be recognized and where appropriate; the municipality's plans will be aligned with these SIPs in an effort to respond to national government's

			service delivery initiatives. Furthermore, work is to be done to align key cross-cutting areas, namely human settlement planning and skills development in line with each of the Strategic Infrastructure Projects, especially: • Green Energy in support of the South African economy (SIP 8): Supporting sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP 2010). • Electricity Generation to support socio-economic development (SIP 9): acceleration of the construction of new electricity generation capacity in accordance with the IRP 2010 to meet the needs of the economy; and addressing historical imbalances. Considering the plans for the alignment of the DM's plans with SIP 8 and SIP 9 it is confirmed that the Springbok Solar Power Plant is in line with the plan.
Masilonyana Local Municipality Draft Integrated Development Plan (IDP)	**Masilonyana Local Municipality**	2019-2020	The vision of the Masilonyana Local Municipality according to the Draft Integrated Development Plan for 2019-2020 (further referred to as the Plan) is to be an integrated, developmental and viable municipality. The mission of the municipality is committed to effective and transparent governance by "*being an integrated, safe and harmonious environment with effective service delivery to attract investors."* The mission also includes promoting economic development, providing sustainable services and improving the quality of life of all people. The Plan identifies the strengths, weaknesses, opportunities and threats to the municipality through a SWOT analysis. The development of solar energy is identified as an opportunity for the municipality. The project is related to the development of solar energy and will enable the evacuation thereof into the national grid. The project is therefore in line with the IDP of the local municipality.

3.4 OTHER LEGISLATION

Other legislation mainly refers to the following:

- Planning legislation governing the rezoning process and approval of the layout plan.
- Design standards and legislation for services provision such as water, sewerage, electricity, etc.
- Municipal bylaws related to building plans, building regulations, etc.

3.5 RELEVANT GUIDANCE

The following guidance was considered in conducting the EIA:

- The Equator principles III (2013)[1]
- World Bank Group Environmental, Health and Safety General Guidelines (EHS Guidelines) (2007)
- Environmental, Health, and Safety Guidelines for Electric Power Transmission and Distribution (2007)
- International Finance Corporation's Policy on Environmental and Social Sustainability (2012)
- DEA. (2013). Draft National Renewable Energy Guideline. Department of Environmental Affairs, Pretoria, South Africa
- DEA, (2012), Guideline 5 – Final companion to the National Environmental Management Act (NEMA) Environmental Impact Assessment (EIA) Regulations of 2010
- DEA, (2012), Guideline 7 – Public participation in the Environmental Impact Assessment process
- DEA, (2012), Guideline 9 – Need and desirability
- DEAT, (2006), Guideline 3 – General guide to the Environmental Impact Assessment Regulations
- DEAT, (2006), Guideline 4 – Public participation in support of the Environmental Impact Assessment Regulations
- DEAT, (2006), Guideline 5 – Assessment of alternatives and impacts in support of the Environmental Impact Assessment Regulations
- BirdLife, (2017). Best Practise Guidelines Birds & Solar Energy: Guidelines for assessing and monitoring the impact of solar power generating facilities on bird in southern Africa.

3.6 CONCLUSION

The EIA was undertaken in accordance with the EIA Regulations (2017) published in GNR 326, in terms of Section 24(5) and 44 of the NEMA as amended as well as all relevant National legislation, policy documents, national guidelines, the World Bank EHS Guidelines, the IFC Performance Standards, and the Equator Principles.

The legislative and policy context plays an important role in identifying and assessing the potential social impacts associated with the proposed development. For this reason, the

[1] Although this report is not written in terms of the Equator Principles (EPs), it fully acknowledges that the EPs will need to be complied with should funding for the project be required.

proposed development project will be assessed in terms of its fit with the key legislative, policy and planning documents discussed above.

The main findings of the review of the policy documents on all spheres of Government indicated that strong support was given towards renewable energy (and the associated infrastructure required for the operation of such developments), specifically PV solar energy and therefore it is concluded that there is support for the development of the power line proposed to cater for the Sonvanger Photovoltaic Solar Power Plant. The White Paper on the Energy Policy of the Republic of South Africa of 1998 stated that due to the fact that renewable energy resources operate from an unlimited resource base, i.e. the sun, renewable energy can increasingly contribute towards a long-term sustainable energy supply for future generations. This policy further highlights that due to the unlimited resources base of renewable energy in South Africa, renewable energy applications, like PV solar energy and associated infrastructure, are more sustainable in terms of social and environmental costs. The Integrated Resource Planning for Electricity for South Africa of 2010–2030, the National Infrastructure Plan of South Africa and the New Growth Path Framework all support the development of the renewable energy sector. In particular, the IRP also indicated that 43% of the energy generation in South Africa is allocated to renewable energy applications. On a District and Local level limited attention is given explicitly to renewable sources like PV solar energy, however the documents reviewed do make provision for increase energy supply and efficiency in improving the quality of lives in terms of efficient physical infrastructure as well as socio-economic growth. At Provincial, District and Local level the policy documents support the applications of renewables.

The review of the relevant policies and documents related to the energy sector therefore indicate that renewables, like solar energy and the establishment of solar energy facilities and associated infrastructure, including grid connection, are supported on all spheres of Government. The proposed power line for the Sonvanger Photovoltaic Solar Power Plant is therefore supported by the related policy and planning documents reviewed in this section of the report.

4 THE NEED AND DESIRABILITY

This section aims to address the following requirements of the regulations:

Appendix 1. (3) An BAR (...) must include-

(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;

4.1 THE NEED FOR THE PROPOSED ACTIVITY

The power line forms part of the electrical infrastructure of the authorised Sonvanger Photovoltaic Solar Power Plant and the proposed activity is a direct result of the growing demand for electricity and the need for renewable energy in South Africa. According to Eskom, the demand for electricity in South Africa has been growing at approximately 3% per annum. This growing demand, fuelled by increasing economic growth and social development, is placing increasing pressure on South Africa's existing power generation capacity. Coupled with this, is the growing awareness of environmentally responsible development, the impacts of climate change and the need for sustainable development.

Over 90% of South Africa's electricity generation is coal based, the Word bank estimates that these results in an annual, per capita carbon emission of ~8.9 tons per person. Based on 2008 fossil-fuel CO_2 emissions statistics released by the Carbon Dioxide Information Analysis Centre, South Africa is the 13th largest carbon dioxide emitting country in the world and the largest emitter in Africa (Boden, et al. 2011).

The primary rationale for the authorised SPP is to add new generation capacity from renewable energy to the national electricity mix and to aid in achieving the goal of 42% share of all new installed generating capacity being derived from renewable energy forms, as targeted by the Department of Mineral Resources and Energy (DMRE) (Integrated Resource Plan 2010-2030). The establishment of the photovoltaic solar facility, and the associated power line as proposed, will significantly contribute to achieving this objective and will also address some of the strategic objectives identified by the Masilonyana Local Municipality's Integrated Development Plan such as ensuring economic growth in the region and creating long term employment (IDP, 2019-2020).

The benefit of constructing the power line and thereby connecting the authorised Sonvanger PV Solar Power Plant to the electricity grid outweighs any negative aspects relating to the construction and associated loss of land. The proposed project will facilitate the connection of the facility to the national grid thereby facilitating the transmission of renewable energy and upliftment of the local community through social economic development initiatives. This will have a positive impact at a local, regional and national level. Without the development of the proposed power line the operation of the Sonvanger PV SPP will not be possible.

4.2 THE DESIRABILITY OF THE PROPOSED ACTIVITY

The facility's contribution towards sustainable development and the associated benefits to society in general is discussed below. The desirability of the proposed power line is directly linked with the desirability of the Solar Power Plant that it will cater for.

- Lesser dependence on fossil fuel generated power - The deployment of the facility, and the required grid connection infrastructure, will have a positive macro-economic impact by reducing South Africa's dependence on fossil fuel generated power and assisting the country in meeting its growing electricity demand.
- Increased surety of supply - By diversifying the sources of power in the country, the surety of supply will increase. The power demands of South Africa are ever increasing and by adding solar power this demand can be met, even exceeded without increasing pollution in relation to the use of fossil fuels. The project has the potential of "securing" economic activity by assisting in removing supply constraints if Eskom generation activities result in a supply shortfall. When supply is constrained, it represents a limitation to economic growth. When a supply reserve is available, it represents an opportunity for economic growth.
- Local economic growth - The proposed project will contribute to local economic growth by supporting industry development in line with provincial and regional goals and ensuring advanced skills are drawn to the Free Sate Province. The project will likely encounter widespread support from government, civil society and businesses, all of whom see potential opportunities for revenues, employment and business opportunities locally. The development of the photovoltaic solar facility and the associated proposed grid connection infrastructure will in turn lead to growth in tax revenues for local municipalities and sales of carbon credits, resulting in increased foreign direct investment.
- Lower costs of alternative energy - An increase in the number of solar facilities commissioned will eventually reduce the cost of the power generated through solar facilities. This will contribute to the country's objective of utilising more renewable energy and less fossil fuel based power sources. It will assist in achieving the goal to generate 10 000 GWh of electricity from renewable energy by 2015 and the reduction of South Africa's GHG emissions by approximately 34% below the current emissions baseline by 2020.
- Reduction in greenhouse gas emissions - The additional power supplied through solar energy, proposed to be evacuated to the national grid via the proposed power line, will reduce the reliance on the combustion of fossil fuels to produce power. The South African electricity grid is predominantly coal-fired and therefore GHG emissions intensive (coal accounts for more than 92% of the fuel used in South Africa's electricity generation). The reduction of GHG emissions as a result of the project implementation will be achieved due to a reduction of CO_2 emissions from combustion of fossil fuel at the existing grid-connected power plants and plants which would likely be built in the absence of the project activity.
- CDM Project - A solar energy facility also qualifies as a Clean Development Mechanism (CDM) project (i.e. a financial mechanism developed to encourage the development of renewable technologies).
- Climate change mitigation - On a global scale, the project makes a contribution to greenhouse gas emission reduction and therefore contributes toward climate change mitigation.
- Reduced environmental impacts - The reduction in electricity consumed from the grid will not only result in a reduction in greenhouse gas emissions, but also the

prevention of negative impacts associated with coal mining. For example, coal power requires high volumes of water, in areas of South Africa where water supply is already over-stretched and water availability is highly variable. Photovoltaic solar energy technology also does not produce the sulphur emissions, ash or coal mining concerns associated with conventional coal fired electricity generation technologies resulting in a relatively low level of environmental impacts. It is a clean technology which contributes toward a better quality environment for employees and nearby communities.

- Social benefits - The project activity is likely to have significant long-term, indirect positive social impacts that may extend to a regional and even national scale. The larger scale impacts are to be derived in the utilisation of solar power and the experience gained through the construction and operation of the power plant (including the grid connection infrastructure). In future, this experience can be employed at other similar solar installations in South Africa.

- Provision of job opportunities - The main benefit of the proposed development operating in the area is that local companies or contractors will be hired for the duration of the construction period. The operational phase will provide permanent job opportunities to the local communities from the surrounding area since security guards and general labourers will be required on a full time basis. Approximately 800 employment opportunities will be created during the construction phase and 55 during the operational phase - this number is the total number of opportunities for both the authorised Sonvanger Photovoltaic solar Power Plant and the proposed power line.

- Indirect socio-economic benefits - The increase in the demand for services such as accommodation, transportation, security, general maintenance and catering will generate additional indirect socio-economic benefits for the local community members.

- Effective use of resources - The proposed development in this specific area will generate alternative land use income through rental for the energy facility (including the proposed associated power line), which will have a positive impact on agriculture. . It will provide the farming enterprise with increased cash flow and rural livelihood, and thereby improve the financial sustainability of agricultural activities. Also, the grid connection corridor is parallel to the R30 regional road which ensures the consolidation of linear disturbance and infrastructure within the landscape

- Preferred location - The proposed grid connection corridor is considered to be the most feasible option for the location of this infrastructure, taking technical and environmental issues into consideration, as well as the opportunity to consolidate linear infrastructure within the landscape. The proposed power line is approximately 22km long, and the proposed route of the power line is the shortest route from the on-site substation to the existing Oryx-Joel 132kV power line and is the preferred alternative for the developer.

- Cumulative impacts of low to medium significance –Seven solar facilities have been granted environmental authorisation within proximity radius of 30km to the proposed Sonvanger PV solar power plant. No cumulative impacts with a high

residual risk have been identified. In terms of the desirability of the development of sources of renewable energy (including the required associated infrastructure), it may be preferable to incur a higher cumulative loss in such a region as this one and in a location where linear infrastructure and disturbance has already been undertaken, than to lose land with a higher environmental value (i.e. less disturbed) elsewhere in the country.

5 DESCRIPTION OF ENVIRONMENTAL ISSUES

This section aims to address the following requirements of the regulations:

Appendix 1. (3) An BAR (...) must include-

(g) A motivation for the preferred site, activity and technology alternative;

(h) a full description of the process followed to reach the proposed preferred alternative, within the site, including –

(i) details of all the alternatives considered;

(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;

(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;

(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;

(v) the impacts and risks identified for each alternative, including the nature significance, consequence, extent, duration and probability of the impacts including the degree to which these impacts –

(aa) can be reversed;

(bb) may cause irreplaceable loss of resources; and

(cc) can be avoided, managed or mitigated;

(viii) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;

(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.

(vii) the possible mitigation measures that could be applied and level of residual risk;

(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and

(xi) a concluding statement indicating the preferred alternative development location within the approved site.

5.1 CONSIDERATION OF ALTERNATIVES

The DEAT 2006 guidelines on 'assessment of alternatives and impacts' proposes the consideration of four types of alternatives namely, the no-go, location, activity, and design alternatives. It is however, important to note that the regulation and guidelines specifically

state that only 'feasible' and 'reasonable' alternatives should be explored. It also recognizes that the consideration of alternatives is an iterative process of feedback between the developer and EAP, which in some instances culminates in a single preferred project proposal.

The grid connection corridor proposed for the development is considered to be the preferred alternative for development based on the location of the connection point into the national grid in relation to the authorised SPP, the need to identify the shortest and most feasible route for the connection and the need to consider the current environment and how disturbance within the landscape can be consolidated within an area (i.e. along an existing linear disturbance such as a road etc.) than rather being distributed throughout. The developer also considers the grid connection corridor as being preferred from a technical perspective.

The following sections explore different types of alternatives in relation to the proposed power line in more detail.

5.1.1 No-go alternative

This alternative considers the option of 'do nothing' and maintaining the status quo. The description provided in section 5.3 of this report could be considered the baseline conditions (status quo) to persist should the no-go alternative be preferred. The grid connection corridor and the surrounding areas is currently zoned for agricultural land uses. Should the proposed activity not proceed, the corridor will remain unchanged and will continue to be used for grazing for cattle, cultivation etc. (refer to the photographs of the site). The purpose of the proposed 132kV power line is to connect the authorised Sonvanger Photovoltaic Solar Power Plant with the National Grid. If the status quo is maintained, the potential opportunity costs in terms of the successful operation of the SPP would be lost, since it will not be able to operate without the power line, which in turn will result in job losses and loss of economic growth in the area.

5.1.2 Location alternatives

This alternative asks the question, if there is not, from an environmental perspective, a more suitable location for the power line. Only one route alternative is being considered, since this is considered as the most feasible and shortest route to connect the SPP to the National Grid. The route which the grid connection corridor follows also provides an opportunity for the consolidation of linear disturbance and infrastructure within the landscape based on the presence of the R30 regional road. The proposed power line is approximately 22km long, and the proposed route of the power line is the shortest route from the authorised on-site substation to the National Grid. This option also ensures that the corridor does not cut through the centre of any properties but rather connect to the grid in an area that has already been characterised by disturbance and linear infrastructure.

5.1.3 Design and layout alternatives

The choice of pylon structure to be used for the power line will be determined in consultation with Eskom and does not significantly affect the environmental impacts of the proposed development as provision has already been made for the visual, avifauna, ecological and heritage impacts of erecting a power line. No defined structure has been confirmed at this stage and will depend on Eskom's technical requirements. The proposed

132kV line must be constructed according to the authorised standards for a power line approved by Eskom Holdings SOC Ltd. The structure to be utilised for the power line towers will also be informed by the local geotechnical and topographical conditions. The following alternatives are considered with regards to the proposed structures:

Steel lattice towers:

The steel lattice towers provide the following advantages over the other tower types available:

- Enables multipath earthing which enhances the overall electrical performance of the power line.
- Is visually less obtrusive than the mono-pole options.
- Is more practicable that other options i.e. more cost effective and more practical to construct and maintain.
- Is safer to work on than the monopole and wood pole structures.
- Is more durable than the wood pole structures.

Steel monopoles:

The steel monopole is considered less suitable than the steel lattice towers for the following reasons:

- Is visually more intrusive than the lattice towers.
- Is more expensive than the lattice towers.
- Requires more steel than the lattice towers.
- Is more difficult to erect.
- Is not as safe to work on as the lattice towers.

Wood poles:

Wood pole structures are only used in extreme circumstances where a visual impact needs to be avoided. Wood pole structures may be cheaper to produce and to construct, but they have one tenth of the lifespan of the metal counterparts and are far more susceptible to weather conditions which makes them less efficient and practicable. The wood pole structure is also more susceptible to having the cross arms burnt off by electrical faults as well as being susceptible to deformation with height.

5.1.4 Technology alternatives

The power line will be constructed within the identified grid connection corridor towards the existing Oryx-Joel 132kV power line. The 132kV overhead power line is the only preferred alternative for the evacuation of the generated electricity due to the following reasons:

Overhead Transmission Lines - Overhead lines are less costly to construct than underground lines. Therefore, the preference with overhead lines is mainly on the grounds of cost. Overhead lines allow high voltage operations and the surrounding air provides the necessary

electrical insulation to earth. Further, the surrounding air cools the conductors that produce heat due to lost energy (Swingler et al, 2006).

The overall weather conditions in the Free State Province is less likely to cause damage and faults on the proposed overhead transmission power line. Nonetheless, if a fault occurs, it can be found quickly by visual means using a manual line patrol. Repair to overhead lines is relatively simple in most cases and the line can usually be put back into service within a few days. In terms of potential impacts caused by overhead transmission lines include visual intrusion and threats to sensitive habitat (where applicable).

The choice of structure to be used for the power line will be determined in consultation with Eskom once the Engineers have assessed the geotechnical and topographical conditions and decided on a suitable structure which meets the prescribed technical requirements. The choice of structures to be used will not have any adverse impacts on the environment. The line will be constructed according to the authorised standards for a power line approved by Eskom Holdings SOC Ltd.

Underground Transmission Lines - Underground cables have generally been used where it is impossible to use overhead lines for example because of space constraints. Underground cabling of high voltage power lines over long distances is not considered a feasible or environmentally practicable alternative for the following reasons:

- Underground cabling will incur significantly higher installation and maintenance costs.
- It is more difficult and takes longer to isolate and repair faults on underground cables.
- There is increased potential for faulting at the transition point from underground cable to overhead power line.
- Underground cables require a larger area to be disturbed during construction and maintenance operations and hence have a bigger environmental disturbance footprint.
- Underground cabling requires the disturbance of a greater area when it comes to agriculture and other compatible land uses as the entire servitude becomes available for use as opposed to just the area around the towers.

The use of an underground power line is not feasible for the proposed project due to the length of the line, which is ~22km long.

The following alternatives may be considered for the overhead power line:

Single Circuit Overhead Power Line

The use of single circuit overhead power lines to distribute electricity is considered the most appropriate technology and has been designed over may years for the existing environmental conditions and terrain as specified by Eskom Specifications and best international practice. Based on all current technologies available, single circuit overhead power lines are considered the most environmentally practicable technology available for the distribution of power. This option is considered appropriate for the following reasons:

- More cost-effective installation costs
- Less environmental damage during installation
- More effective and cheaper maintenance costs over the lifetime of the power line.

The use of a single-circuit power line is preferred for the proposed project as it will meet the requirements to evacuate the generated solar electricity from the Sonvanger PV SPP to the national grid.

Double Circuit Overhead Power Line

Where sensitive environmental features are identified, and there is sufficient justification, Eskom will consider the use of double circuit (placing 2 power lines on either side of the same tower structure) to minimize impacts. However, the use of double-circuiting has a number of technical disadvantages:

- Faults or problems on one power line may mean that the other power line is also disabled during maintenance, and this will affect the quality of supply to an area. Larger and taller towers as well as more towers are required for double-circuit power lines.

The double-circuit overhead power line proves more feasible since the single circuit may not have the capacity to transmit the large amount of electricity generated from the plant and during maintenance the entire plant would not have to be off-line as one of the double circuit lines would still be able to supply electricity.

The use of a double-circuit power line is not currently being considered for the development by the developer.

5.2 PUBLIC PARTICIPATION PROCESS

The following sections provide detailed information on the public participation process conducted in terms of Regulations 39 to 44.

5.2.1 General

The public participation process was conducted strictly in accordance with Regulations 39 to 44. The following three categories of variables were taken into account when deciding the required level of public participation:

- The scale of anticipated impacts
- The sensitivity of the affected environment and the degree of controversy of the project
- The characteristics of the potentially affected parties

Since the scale of anticipated impacts is low, the low environmental sensitivity of the site and the fact that no conflict was foreseen between potentially affected parties, no additional public participation mechanisms were considered at this stage of the process. The following actions have already been taken:

- Newspaper advertisement

Since the proposed development is unlikely to result in any impacts that extend beyond the municipal area where it is located, it was deemed sufficient to advertise in a local newspaper. An advertisement was placed in English in the local newspaper (Vista) on the 22 July 2021 (see Appendix C1) notifying the public of the BA process and requesting Interested and Affected Parties (I&APs) to register with, and submit their comments to Environamics Environmental Consultants. I&APs were given the opportunity to raise comments within 40 days of the advertisement.

- Site notices

  Site notices were placed on site in English on 28-29 July 2021 to inform surrounding communities and immediately adjacent landowners of the proposed development. I&APs were given the opportunity to raise comments by 02 September 2021. Photographic evidence of the site notices is included in Appendix C2.

- Hard and/or soft copies of report

  Hard or soft copies of the report will be made available upon request (as relevant). Hard copies will be made available for review to any interested and affected party who may not have access to the Internet or email communication. The availability of the report was made known to all registered I&APs through email and other forms of communication such as WhatsApp and SMS. All hard copies of the report will be sanitized prior to it being posted or couriered, where relevant.

- Direct notification of identified I&APs

  Identified and registered I&APs, including key stakeholders representing various sectors, have been directly informed of the proposed power line via registered post, telephone calls, WhatsApp and emails (as relevant). Registered I&APs have been notified of the availability of the draft BAR. I&APs have been requested to submit comments on the draft report within 30 days. For a complete list of I&APs see Appendix C3 to this report. All letters will be sanitized prior to it being posted, where relevant.

- Direct notification of affected and surrounding landowners and occupiers:

  Written notices have been provided via registered post, WhatsApp or email (as relevant) to all affected and surrounding landowners and occupiers. The landowners were given the opportunity to raise comments within 30 days. All letters have been sanitized prior to it being posted (as relevant). For a list of affected and surrounding landowners see Appendix C3.

  It must be noted that the team is still in process of identifying and making contact with some affected and surrounding landowners whose contact information is not obtainable through Windeed searches and other means. This process will be completed to ensure notification of all affected and adjacent landowners.

- Circulation of Draft Basic Assessment Report

  As mentioned above, copies of the draft Basic Assessment report have been provided to all I&APs via registered post, couriers, Dropbox and/or email (as relevant). They have been be requested to provide their comments on the report within 30 days. All issues identified will be documented and compiled into a

Comments and Responses Report to be included as part of the Final Basic Assessment Report. Hard copies of the report will be sanitized prior to it being posted or couriered (as relevant).

- Circulation of decision and submission of appeals:

  Notice will be given to all identified and registered I&APs of the decision taken by the DFFE. The attention of all registered I&APs will also be drawn to the fact that an appeal may be lodged against the decision in terms of the National Appeals Regulations. In accordance with the provisions of Regulation 4(1) of Government Notice No. 993, an appellant must submit the appeal to the appeal administrator, and a copy of the appeal to the applicant, any registered I&APs and any organ of state with interest in the matter within 20 days from the date that the notification of the decision was sent to the applicant by the competent authority.

5.2.2 Consultation process

Regulation 41 requires that the affected landowners, surrounding landowners, municipality, relevant ward councillor, any organ of state having jurisdiction in respect of any aspect of the activity and any other party as required by the competent authority should be given written notice of the activity. A complete list of all the consultees who received written notice as well as proof of correspondence is attached as Appendix C.

5.2.3 Registered I&APs

I&APs include all stakeholders who deem themselves affected by the proposed activity. According to Regulation 43(1) "*A registered interested and affected party is entitled to comment, in writing, on all reports or plans submitted to such party during the public participation process contemplated in these Regulations and to bring to the attention of the proponent or applicant any issues which that party believes may be of significance to the consideration of the application, provided that the interested and affected party discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application*."

5.2.4 Issues raised by I&APs and consultation bodies

To date no comments have been received from consultation bodies. Any comments received during the circulation of the draft BAR will be summarised in the final BAR. The full wording and original correspondence will be included in Appendix C5.

5.3 THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE PREFERRED ALTERNATIVE

The following sections provide general information on the biophysical and socio-economic attributes associated with the preferred alternative.

5.3.1 Biophysical environment

The biophysical environment is described with specific reference to geology, soils, agricultural potential, vegetation and landscape features, climate, biodiversity and the visual landscape. A number of specialists were consulted to assist with the compilation of this chapter of the report – refer to the table 1.2.

The most notable features identified within the grid connection corridor are valley bottom wetlands, depressions, river channels, floodplains and critical biodiversity areas.

5.3.1.1 Geology, Soils, Land Use and Topography

In terms of geology, the power line corridor is located in the central part of the Main Karoo Basin, east of the line of latitude 24°E that is important for the stratigraphy of the Karoo Basin. These old rocks are unconformably overlain by Quaternary sands and alluvium.

The Main Karoo Basin covers a large proportion of South Africa and represents some 120 million years of deposition. At the base is the Carboniferous-Permian Dwyka Group, then the Permian aged Ecca Group, Permian-Triassic Beaufort Group, the Triassic-Jurassic Stormberg Group, all capped by the Drakensberg basalts.

Intruding through the Karoo rocks are volcanic dykes of Jurassic age, and they were emplaced when the major Drakensberg basalts poured out and capped the Karoo sediments. These dolerite dykes are common in the area and because they are harder than the Karoo sediments they form ridges and hills.

The grid connection corridor is also located on the Quaternary sands, alluvium and calcrete that have covered the underlying rocks during the Quaternary. The depth of the overlying sands, however, is unknown.

The land type unit represented within the corridor include the Bd 20 and Dc16 land types. Bd20 is eutrophic; red soils not widespread upland duplex and margalitic soils rare. Dc16 is prismacutanic and/or pedocutanic diagnostic horizons dominant. In addition, one or more of vertic melanic red structured diagnostic horizons.

The topography is characterised by slightly undulating plains with wetlands and / or drainage channels bisecting the area. The topography of the corridor can be described as generally favourable, when considering that most of the area consists of slopes of less than 1:5. The site is located at an altitude of between 900 and 940 meters above mean sea level (AMSL).

Most properties situated within a 500m radius of the power line corridor are being used for livestock and crop cultivation. The corridor is used for livestock farming and maize cultivation at present. The natural vegetation of the site is mostly intact.

5.3.1.2 Biodiversity and Vegetation

Critical Biodiversity Areas

The Free State Biodiversity Conservation Plan provides the spatial components of bioregional planning (i.e., map of Critical Biodiversity Areas (CBA) and associated land-use guidelines). The following is relevant for the grid connection corridor (Figure 10):

- Most of the corridor represent Ecological Support Areas (ESA) 1 or 2 although most of these areas represent cultivated land or degraded grassland. The management objective for this area is to maintain ecosystem functionality and connectivity allowing for limited loss of biodiversity pattern. Therefore, loss has already occurred cultivation and degradation.

- Small sections of the corridor represent CBA1 areas, although the corridor is more representative of ESAs.
- The remainder of the area represent “Other” areas or “Degraded” areas.

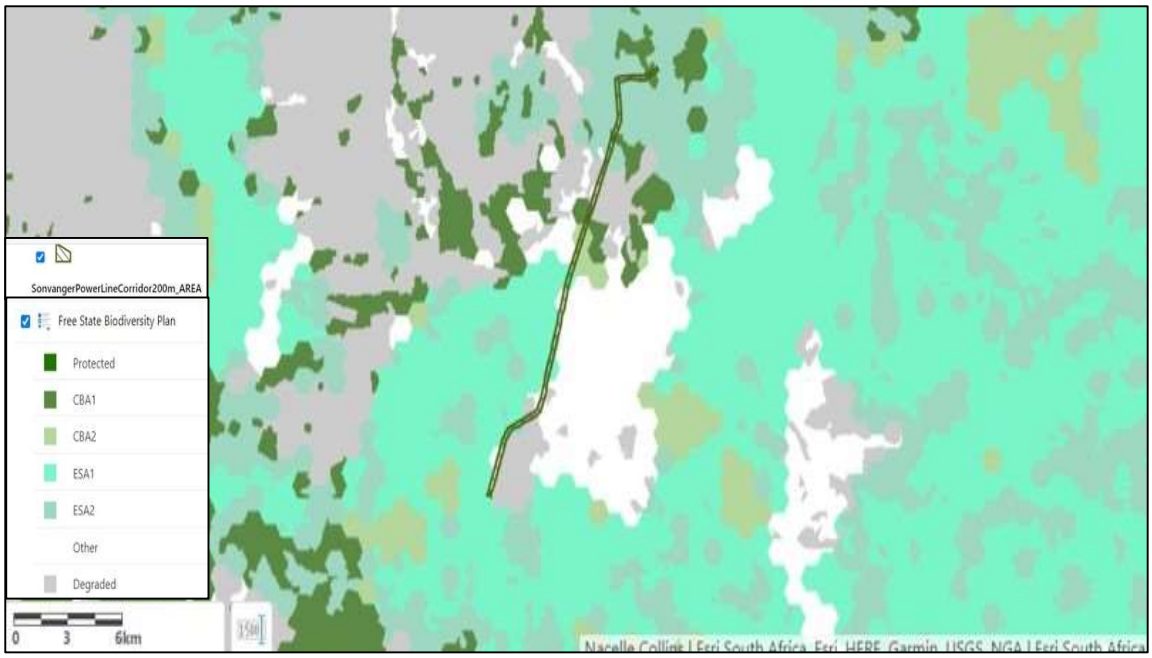

Figure 10: CBAs relevant to the grid connection corridor

Protected Areas (formal and informal)

No formally protected areas occur in close proximity to the grid connection corridor. The closest protected area within the vicinity of the grid connection corridor is the Willie Pretorius Game Reserve located to the east. Based on the distance between the proposed project and the protected area, no impact is expected to occur.

Furthermore, and in terms of the National Protected Areas Expansion Strategy (NPAES), the grid connection corridor is bordered by the Free State Highveld Grassland NPAES, although the development of the power line will not impede on this area.

Important Brid Areas (IBA) are also considered. The grid connection corridor is not located within an IBA, with the Willem Pretorius Game Reserve IBA being the closest IBA located to the east of the project.

Nationally Threatened Ecosystems

The northern section of the grid connection corridor is located within the Vaal-Vet Sandy Grasslands Listed Threatened Ecosystem along the corridor, which is classified as Endangered.

Vegetation

The grid connection corridor lies within the Grassland Biome which is found chiefly on the high central plateau of South Africa. The most recent classification of the area by Mucina & Rutherford (2006) shows that the corridor is classified as Central Free State Grassland

(southern section of the corridor) and Vaal-Vet Sandy Grassland (northern section of the corridor).

Nine vegetation units have been identified to be present within the grid connection corridor. The vegetation units within the grid connection corridor vary according to soil characteristics, topography, and land-use. These units are described below:

1. *Mixed Themeda triandra grassland* - This grassland vegetation unit is described as typical Central Free State Grassland by Mucina & Rutherford (2006) and occurs in the central and southern sections of the corridor. The grass layer is well developed and underlied by red-yellow apedal soils (Hutton soil form) or dark clayey soils of the Arcadia or Swartland Soil Forms. Grasses that dominate on the clayey soils are species such as *Aristida congesta, Eragrostis lehmanniana, Setaria sphacelata* and *Themeda triandra*. The vegetation structure is tall, closed grassland. No red listed or protected species were documented in the unit. The vegetation unit is classified as having a medium sensitivity due to the widespread status through the larger area. The development of the power line is considered suitable in this area.

2. *Degraded Grassland* - The areas adjacent to mining infrastructure and townships are classified as degraded grassland on red-yellow apedal soils of the Oakleaf soil form or Clovelly soil form. According to the soil types and previous land use, the vegetation unit is divided into two variations namely a *Hyparrhenia hirta* degraded grassland close to the Theunissen township areas, and primary old fields dominated by Cynodon dactylon and *Eragrostis plana* in the northern section of the corridor. The grass layer is well developed and dominated by species such as Hyparrhenia hirta, *Cynodon dactylon, Eragrostis plana, Eragrostis chloromelas* and various exotic weeds such as *Tagetes minuta*. The vegetation unit is classified as having a Low sensitivity due to the degraded state of the herbaceous layer. The development of the power line is considered suitable in this area.

3. *Vachellia karroo – Asparagus laricinus woodland* - The microphyllous woodland vegetation unit occurs on soils that vary from red apedal soils of the Hutton soil form or black clayey soils of the Arcadia soil form. The woody layer is dominated by species such as *Vachellia karroo, Vachellia tortilis* and *Ziziphus mucronata*. The woody structure varies from being open woodland to slightly denser woodland with bushclumps in some areas. The grass layer is in a slightly degraded state due to previous overgrazing and dominated by *Setaria sphacelata, Themeda triandra* and *Panicum maximum*. The vegetation unit is classified as having a medium sensitivity due its widespread occurrence in the Grassland Biome. The development of the powerline is considered suitable in this area.

4. *Cultivated Land (maize fields)* - The croplands in the northern section of the corridor form ploughed lands or homogenous stands of maize on sandy soils. Exotic weeds and pioneer grasses often colonize the areas surrounding the croplands. No detailed survey was considered for this area due to the completely modified state of the vegetation and the area has a low sensitivity.

5. *Exotic Bushclumps* - A small section of the project area is characterised by homogenous stands of exotic trees such as *Eucalyptus camaldulensis*. Exotic weeds and pioneer grasses often colonize the areas surrounding these bushclumps. No detailed survey was considered for this area due to the completely modified state of the vegetation and the

area has a low sensitivity. None of the area will be impacted on by the power line development.

6. *Bare ground / built-up land / infrastructure* - The northern and southern sections of the power line corridor represents completely modified built-up land and mining infrastructure. This area is completely modified and colonised by various alien invasive species and other exotic weeds. No detailed survey was considered for this area due to the completely modified state of the vegetation and the area has a low sensitivity.

7. *Drainage Features – Valleybottom Wetlands* - A few valleybottom wetlands were identified in the central and southern section of the power line corridor. Valley bottom wetlands are classified as low-lying, gently sloped areas that receive water from an upstream channel and/or form adjacent hillslopes, not subject to periodic over-bank flooding by a river channel. Surface water in the valley bottom wetlands of the study area flows only seasonally, although the channels are in most cases non-perennial. This wetland vegetation comprises atypical (azonal) vegetation, mainly because of the prolonged moist conditions of the soils. The soils are clayey and do have relatively high water retention abilities. The most abundant and most conspicuous plant species is hygrophilous grasses such as *Andropogon eucomis, Hyparrhenia tamba, Eragrostis gummiflua* and *Setaria sphacelata*. Other plants associated with valley bottom channels are *Juncus effusus, Schoenoplectus corymbosus, Verbena bonariensis, Persicaria serrulata* and *Typha capensis*.

8. *Drainage Features – Depressions* - The depressions in the power line corridor can be classified into two variations namely man-made dams or natural pans classified as endorheic depressions. The vegetation associated with depressions is mostly sedges and bulrushes depending on the depth of the water and the substrate. Species such as *Persicaria serullata, Typha capensis, Schoenoplectus corymbosus, Ludwigia stolonifer* and *Leersia hexandra* mostly grow along the shallow edges of dams and pans in the project area on a muddy substrate. The riparian woodland is characterised by *Vachellia karroo, Ziziphus mucronata* and *Grewia flava*.

9. *Drainage features -River Channels and Floodplains* - The major river in the northern section of the corridor with the associated riparian vegetation are ecologically sensitive, forming important, limited and specialised habitats for several plant and fauna species. The species composition is unique and relatively limited in distribution and coverage. This habitat also forms linear corridors linking different open spaces. The riverine woodland would be important dry season refuge areas for many fauna species in their natural state. It is also a centre of floral diversity. The band of trees that occurs along the channel can be classified as riparian vegetation. This vegetation is very important for connectivity with adjacent vegetation as well as a migratory route for riparian animals. The drainage channel on site is non-perennial.

   The Palmietspruit that bisects the area can be described as a floodplain river or a lowland river. The floodplain is not classified as a floodplain wetland, but a river with some wetland characteristics in the channel and its banks. The vegetation associated with the floodplain is mostly microphyllous woodland and hygrophilous grasses in the corridor. Species such as *Vachellia karroo, Searsia pyroides, Ziziphus mucronata* and *Searsia lancea* mostly grow in the floodplain area, together with grass species such as *Sporobolus africanus* and *Eragrostis rotifer*.

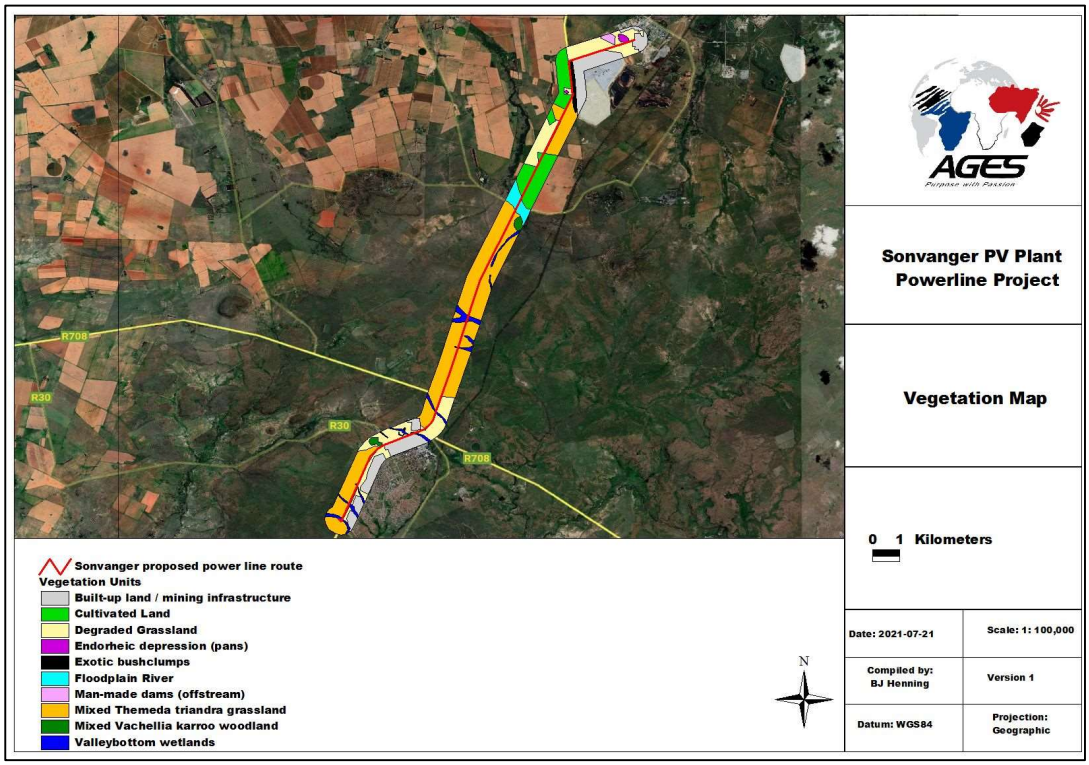

Figure 11: Vegetation units associated with the grid connection

Plant Species

A list of red data plant species previously recorded in the grid square in which the proposed development is planned was obtained from SANBI. No red listed plant species occur in the quarter degree square or was recorded in the power line corridor.

Ecological monitoring should however still be implemented during the construction phase and specific sensitive habitats (riparian) needs to be avoided to ensure that any potential red data species potentially missed during the field surveys are preserved and not potentially impacted on. The EIA screening tool also did not highlight any red listed flora.

Furthermore, no species were identified within the grid connection corridor which is listed under the Free State Nature Ordinance.

Alien invasive and exotic plant species were recorded on site during the surveys as stipulated in the Alien and Invasive Species Regulations (GNR 599 of 2014) – all these species fall within category 1b. These include:

- *Argemone ochroleuca*
- *Datura stramonium*
- *Eucalyptus camaldulensis*
- *Opuntia ficus-indica*
- *Opuntia imbricata*

- *Tamarisk chinensis*
- *Verbena brasiliensis*
- *Xanthium strumarium*

Fauna Species

Five major fauna habitats were observed in the corridor namely:

- Grassland.
- Microphyllous woodland (including riparian woodland).
- Open water habitats / wetlands.
- Croplands.
- Exotic bushclumps.

Much of the large and medium-sized mammal fauna that previously occurred on the project site is now locally extinct or occurs in small, fragmented populations in reserves. Most of the habitat types are fragmented. Therefore, the expected mammalian richness on these areas is considered low, although slightly higher richness values are expected from the more intact grassland, woodland and wetland habitats.

Twenty-nine amphibians occur within the ecoregion, but none are endemic. Breeding habitat of frogs and toads can be found mostly in the permanent wet zone of the wetlands and dams in the larger area. Amphibian species potentially occurring in the larger area include Common River Frog, Natal Sand Frog, Gutteral Toad, Raucous Toad and Bubbling Kassina. These species are non-threatened and widespread, and as such the development will not have any impact on amphibian conservation within the region. The wetlands could provide habitat for the red listed giant bullfrog, and therefore the 32m buffer zone surrounding the wetland features should be adhered to.

Relatively few reptile species occur within the Highveld Ecoregion, mainly due to its cool climate. However, the ecoregion supports some of Africa's most characteristic reptile species, including Nile crocodile (*Crocodylus niloticus*), African rock-python (*Python sebae*), water monitor (*Varanus niloticus*) and veld monitor (*Varanus exanthematicus albigularis*). There are also two strict endemic reptiles: giant girdled lizard (*Cordylus giganteus*), and Agama distanti. Several additional reptile species are near-endemics, including Drakensberg rock gecko (*Afroendura niravia*), giant spinytail lizard (*Cordylus giganteus*), and Breyer's whiptail (*Tetrodactylus breyeri*).

Specific reference has been made in the DFFE Screening Report to the potential presence of the Spotted Necked Otter. These otters are aquatic and require permanent and continuous waterways. They prefer clear water with rocks. They are found in lakes, swamps, rivers, and may be found in mountain streams at higher elevations. They are absent in turbid rivers and shallow alkaline lakes. They live in dens, which are found near these sources of water. Considering this, the species has a low probability of occurring within the corridor due to their large home ranges and limited habitats.

5.3.1.3 Surface Water Features

Two wetland types were identified within the grid connection corridor namely:

- Valleybottom wetland with channel.
- Depressions:
    - Exorheic depressions (man-made dams).
    - Endorheic depressions (pans and off stream dams).

The other drainage features on the proposed power line corridor are classified as channels (rivers) with riparian woodland. The rivers are classified as Floodplain Rivers. Refer to Figure 12.

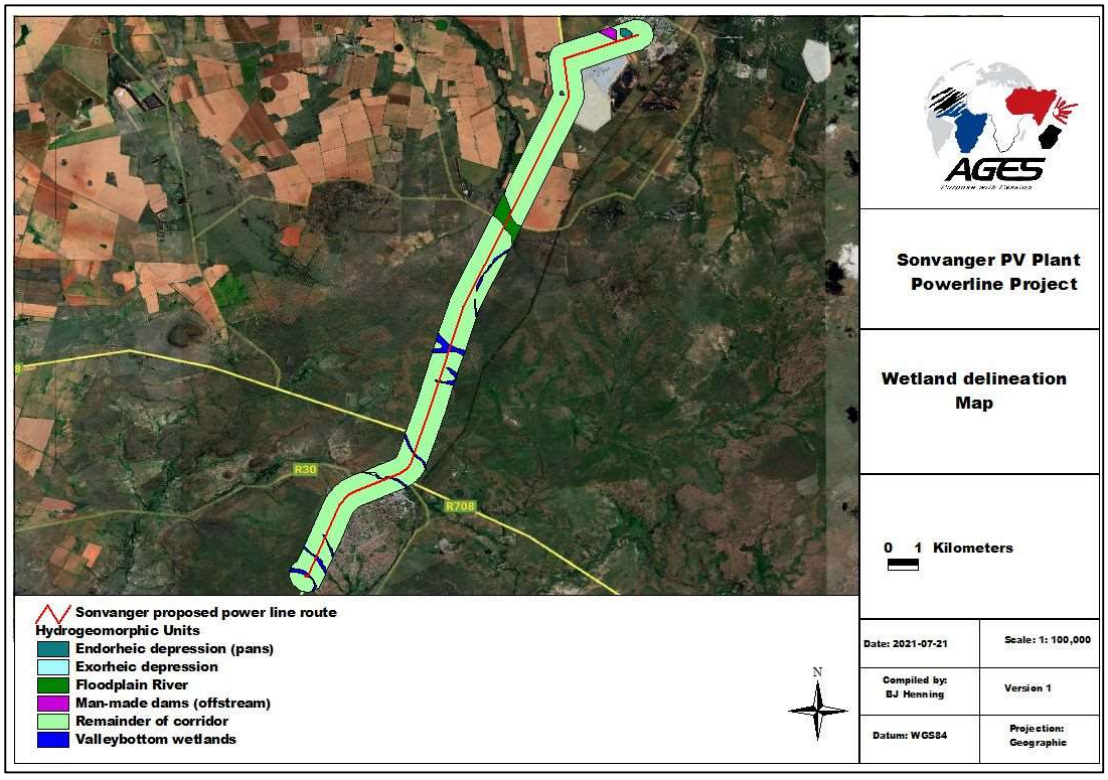

Figure 12: Riparian / wetland delineation of the grid connection corridor

5.3.1.4 Avifauna

The mix of species recorded previously during SABAP2 assessments for the wider pentads of the area comprised a wide diversity of species, with waders, waterfowl, gamebirds, raptors, insectivores and granivores all well represented. The total species count and diversity of functional groups is expected to be much lower for the site surveys, due to the shorter survey timeframes and vastly smaller assessment area with lower habitat diversity.

There are Red Data species that could possibly occur within the corridor, even as vagrants and the likelihood of their occurrence must be assessed. The potential red data species for the proposed power line for the Sonvanger SPP, along with probability estimates and notes are presented below:

- Secretarybird- Vulnerable. Not recorded in the pentads but has low likelihood of occasionally occurring on site.
- Lanner Falcon- Vulnerable. Not recorded in the pentads but has moderate likelihood of occasionally occurring on site.
- Red-footed Falcon- Near Threatened. Not recorded in the pentads but has low likelihood of occasionally occurring on site .
- Cape Vulture- Endangered. Not recorded in the pentads, very low likelihood of occasionally occurring on site if animal carcases are present.
- Lappet-faced Vulture- Endangered. Not recorded in the pentads, very low likelihood of occasionally occurring on site if animal carcases are present.
- Martial Eagle- Endangered. Not recorded in the pentads, very low likelihood of occasionally occurring on site.
- African Marsh Harrier- Endangered. Recorded in the pentads. Confirmed presence for the wider pentads.
- Black Harrier- Endangered. Recorded in the pentads. Confirmed presence for the wider pentads.
- White-bellied Bustard- Vulnerable. Not recorded in the pentads and has very low likelihood of sporadic occurrence.
- African Grass Owl- Vulnerable. Not recorded in the pentads. Habitat suitability is marginal, thus has very low likelihood of sporadic occurrence.
- Black-winged Pratincole- Near Threatened. Not recorded in the pentads. Habitat suitability is marginal on the SPP site but is expected to occasionally occur in the surrounding croplands.
- Lesser Flamingo- Near-Threatened. Recorded in the pentads. Confirmed presence for the wider pentads
- Maccoa Duck- Near-Threatened. Recorded in the pentads. Confirmed presence for the wider pentads.

The following endemic or near-endemic (most of the global range is within South Africa's borders) species were recorded during prior SABAP2 assessments for the wider pentads:

- Cloud Cisticola- Near-endemic.
- Fiscal Flycatcher- Endemic.
- Pied Starling- Endemic to South Africa, Lesotho and Swaziland.
- South African Cliff Swallow- Breeding Near-endemic.
- Karoo Thrush- Near-endemic.
- Black Harrier- Near-endemic.
- Sickle-winged Chat- Near-endemic.

Apart from Black Harrier (which is also Endangered), all of the endemic or near-endemic species listed above that have been confirmed during past SABAP2 assessments have wide distributional ranges and reportedly healthy populations and should not present and substantial threats as a result of development of this site

5.3.1.5 Climate

The area within which the power line corridor is situated falss within the summer and autumn rainfall region with very dry winters and frequent frost that occurs during the colder winter months. The spatial and temporal distribution of rainfall is very complex and has great effects on the productivity, distribution and life forms of the major terrestrial biomes. The mean annual precipitation for the region is around 560mm. The mean annual temperature for the area is 15.2°C, and the mean annual frost days is 43 days. Mean Annual Potential Evaporation is 2226mm, with Mean Annual Soil Moisture Stress of 78%.

5.3.1.6 Visual landscape

Visual Receptors can be defined as: “Individuals, groups or communities who are subject to the visual influence of a particular project”. This section is intended to highlight possible Receptors within the landscape which due to use could be sensitive to landscape change. They include:

- Area receptors which include the towns of:
  - Theunissen.
  - Virginia.
  - Kitty.
  - Meloding.
  - Merriespruit.
  - Erfenis Dam.
  - Masilo.

- Linear receptors, which include:
  - R30.
  - Bree Street.
  - R708.
  - S478.
  - S494.
  - S1622.
  - R730.
  - R73.
  - Small Gravel Roads.
  - Storm water channel.
  - Railway line.
  - Doring River.
  - Sand River.
  - Vet River
  - Eskom Power Line Infrastructure.

- Point receptors, which include:
  - Farmsteads.
  - Agricultural developments.
  - Theunissen Golf Club.
  - Sewerage works.
  - Goldfields Game Ranch.
  - The Wedding Barn.
  - Beatrix Mine Sibanye Stillwater.
  - Beatrix mine.
  - Beatrix Mine Substation.
  - Sibanye Gold Beatrix 4.
  - Joel Mine.
  - Old Oryx Mine.
  - Tera4 Plant.

5.3.1.7 Socio-economic conditions

The grid connection corridor is located within the Mailonyana Local Municipality. The Masilonyana Local Municipality is a Category B municipality located within the Lejweleputswa District in the Free State. The municipality has been under administration from March 2017. It is situated between the province's biggest municipality, Mangaung Metro, in the south and the second-biggest municipality, Matjhabeng, in the north. It is one of five municipalities in the district. The following former Transitional Local Councils were amalgamated into the municipality: Theunissen, Brandfort, Winburg, Soutpan and Verkeerdevlei. It is an impoverished semi-urban area with a high unemployment rate. Theunissen is situated on the ZR Mahabane Corridor between Bloemfontein and Welkom and hosts the three mines within the municipal jurisdiction.

The main economic sectors of the municipal area includes agriculture, mining and community services.

5.3.1.8 Cultural and heritage aspects

Archaeology

According to Van Svhalkwyk (2014), "Very little is known about pre-colonial settlement in the region. This is probably the result of a very low occupation of the region by humans. This, in turn, is probably the result of the fact that there are very little resources, e.g. hills, outcrops and rivers in the region which were preferred by humans to settle in its vicinity. The town of Theunissen was laid out in 1907 on the farms Smaldeel and a portion of Poortje and attained municipal status in 1912. It was first known as Smaldeel, but the name was changed to Theunissen in honour of Commandant H. Theunessin, who obtained permission for its establishment (Raper 2004). Two formal cemeteries are located on the northern side of the town."

GoogleEarth Imagery of the R30 indicates a landscape that has been thoroughly transformed by agriculture. Furthermore, as the proposed alignment of the power line is located along an existing regional road, the R30, it is not anticipated that this proposed development will negatively impact on any significant cultural landscape heritage resources.

Van Schalkwyk (2014) completed an HIA for the proposed Sonvanger PV facility located southwest of Theunissen. He identified no heritage resources in his assessment. Birkholtz (2017) completed an HIA for the proposed Tetra4 Cluster 1 project which proposes to extend natural gas production operations within an existing Production Right, near the town of Virginia. Some of the HIA by Birkholtz (2017) overlaps with this proposed grid connection corridor. Birkholtz (2017) conducted a thorough desktop assessment of the area including the Battle of Zand River at the bridge on the road between Welkom and Theunissen located outside of this assessment area as well as the historic diamond mining activities in the area. In his field assessment, Birkholtz (2017) identified a number of cemeteries and historic structures as well as two scatters of Middle and Later Stone Age lithics - both determined to have contextual significance and are graded IIIC. Based on the known archaeological sensitivity of the broader area, as well as the previously disturbed nature of the grid connection corridor along the R30 and the limited footprint anticipated for the proposed power line, it is not anticipated that the proposed development will negatively impact on any significant archaeological resources.

It is noted that there is an existing municipal cemetery located within the grid connection corridor, this is a modern cemetery managed by the municipality which is clearly demarcated. The proposed power line will not impact on this cemetery through the careful placement of pylons and the location of the power line alignment as close to the R30 as possible. While it remains possible that burials may be located outside of the cemetery and within the power line corridor, impact to these sites can be avoided through strategic placement of the pylons.

Palaeontology

According to the SAHRIS Palaeosensitivity Map, the grid connection corridor is underlain by sediments of zero and moderate palaeontological sensitivity. According to the extract from the Council of GeoScience map for Winberg 2826, the sediments underlying the development area consist of Jurassic Dolerite (zero paleontological sensitivity) and Quaternary Sands (moderate sensitivity). According to a Desktop Palaeontological Assessment completed by Bamford (2021) for this project, "The proposed site route in the northern section lies on the Quaternary sands, alluvium and calcretes that are non-fossiliferous unless there are traps for fossils such as paleo-pans or palaeo-springs. No such feature is visible on the satellite imagery. The southern half is on non-fossiliferous dolerite of Jurassic age. Based on this information it is recommended that no palaeontological site visit is required unless fossils are found when excavations for foundations commence."

5.4 SITE SELECTION MATRIX

Due to the nature of the proposed development, the location of the power line is largely dependent on technical and environmental factors such as topography of the site, access to the grid and capacity of the grid.

The grid connection corridor is considered favourable and suitable from a technical perspective due to the following characteristics:

- Site access: Access will be easily obtained from the R30 Regional Road.
- Grid connection: In order for the PV facility to connect to the national grid a substation and single-circuit 132kV power line will be constructed within the

identified corridor towards the existing Oryx-Joel 132kV power line. Available grid connections are becoming scarce and play a huge role when selecting a viable site.

- Environmental sensitivities: From an environmental perspective the proposed grid connection corridor is considered highly desirable due to limited environmental sensitivities in terms of vegetation, surface water and landscape features, climate, biodiversity and the visual landscape – refer to Section 5.3.1 of this report. Features that need to be avoided by the placement of infrastructure, mainly related to surface water features, have been identified. Considering the nature of the proposed infrastructure (i.e. a power line which can span sensitive features), avoidance of the sensitive features will be possible with proper planning on the developer's side.

It is evident from the discussion above that the proposed grid connection corridor may be considered favourable and suitable in terms of these site characteristics. Also, based on the opportunities presented with the proposed routing of the power line (as per the grid connection corridor being assessed), which is the shortest route to complete the connection and the opportunity to rather consolidate linear disturbance within the landscape than distribute it throughout, no other grid connection corridor routes are being considered. Based on the above, no site selection matrix was therefore required to compare the corridor.

5.5 CONCLUDING STATEMENT ON ALTERNATIVES

When considering the information provided by the specialists with regards to current conditions of the proposed grid connection corridor, the preferred grid connection corridor emerges as preferred due to the fact that the proposed power line route is the shortest option for the connection, consolidates linear infrastructure and disturbance within the landscape and is preferred by Eskom and the developer.

In conclusion the preferred alternative entails the development of the 22km power line on an identified corridor within various properties located along the R30 regional road (close to Theunissen).The preferred layout of the power line route is indicated in the attached layout plan to this BA report. It may be concluded that this is the only location that was assessed in detail for the proposed development.

6 DESCRIPTION OF THE IMPACTS AND RISKS

This section aims to address the following requirements of the regulations:

Appendix 1. (3)(i) An BAR (...) must include-

(i) a full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred location through the life of the activity, including-

(i) a description of all environmental issues and risks that were identified during the EIA process; and

(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.

(j) an assessment of each identified potentially significant impact and risk, including-

(i) cumulative impacts;

(ii) the nature, significance and consequences of the impact and risk;

(iii) the extent and duration of the impact and risk;

(iv) the probability of the impact and risk occurring;

(v) the degree to which the impact and risk can be reversed;

(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and

(vii) the degree to which the impact and risk can be mitigated;

(k) where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;

6.1 SCOPING METHODOLOGY

The contents and methodology of the basic assessment report aimed to provide, as far as possible, a user-friendly analysis of information to allow for easy interpretation.

- Checklist (see section 6.1.1): The checklist consists of a list of structured questions related to the environmental parameters and specific human actions. They assist in ordering thinking, data collection, presentation and alert against the omission of possible impacts.

- Matrix (see section 6.1.2): The matrix analysis provides a holistic indication of the relationship and interaction between the various activities, development phases and the impact thereof on the environment. The method aims at providing a first order cause and effect relationship between the environment and the proposed activity. The matrix is designed to indicate the relationship between the different stressors and receptors which leads to specific impacts. The matrix also indicates the specialist studies that have been conducted to address the potentially most significant impacts.

6.1.1 Checklist analysis

The independent consultant conducted a site visit on 28-29 July 2021. The site visit was conducted to ensure a proper analysis of the site specific characteristics of the study area. Table 6.1 provides a checklist, which is designed to stimulate thought regarding possible consequences of specific actions and so assist scoping of key issues. It consists of a list of structured questions related to the environmental parameters and specific human actions. They assist in ordering thinking, data collection, presentation and alert against the omission of possible impacts. The table highlights certain issues, which are further analysed in matrix format in section 6.2.

Table 6.1: Environmental checklist

QUESTION	YES	NO	Un-sure	Description
1. Are any of the following located on the site earmarked for the development?				
I. A river, stream, dam or wetland	✕			The Wetland and Riparian Impact Assessment (Appendix D2) identified two wetland types present within the grid connection corridor, which includes valleybottom wetlands and depressions. Other drainage features present includes channels (rivers) and riparian woodland. The rivers are classified as Floodplain Rivers.
II. A conservation or open space area		✕		None.
III. An area that is of cultural importance		✕		None.
IV. Site of geological significance		✕		None.
V. Areas of outstanding natural beauty		✕		None.
VI. Highly productive agricultural land	✕			The northern section of the grid connection corridor crosses croplands / ploughed lands or homogenous stands of maize on sandy soils.
VII. Floodplain	✕			The Palmietspruit that bisects the corridor can be described as a floodplain river or a lowland river. The floodplain is not classified as a floodplain wetland, but a river with some wetland characteristics in the channel and its banks.
VIII. Indigenous forest		✕		None.

IX. Grass land	×			The grid connection corridor lies within the Grassland Biome. The vegetation types present within the grid connection corridor includes the Central Free State Grassland and the Vaal-Vet Sandy Grassland.
X. Bird nesting sites		×		None.
XI. Red data species		×		No red listed plant species occur in the quarter degree square or was recorded in the corridor.
XII. Tourist resort		×		None.
2. Will the project potentially result in potential?				
I. Removal of people		×		None.
II. Visual Impacts	×			The Visual Impact Assessment (Appendix D4) concludes that the significance of the visual impact will be a "Negative Low Impact". The only receptors likely to be impacted by the proposed development are the nearby property owners and on nearby roads.
III. Noise pollution		×		Construction activities will result in the generation of noise over a period of 12 months. The noise impact is unlikely to be significant due to the location of the power line parallel to an existing regional road.
IV. Construction of an access road		×		Access will be obtained via the existing R30 regional road.
V. Risk to human or valuable ecosystems due to explosion/fire/ discharge of waste into water or air.		×		None.
VI. Accumulation of large workforce (>50 manual workers) into the site.		×		Approximately 800 employment opportunities will be created during the construction phase and 55 during the operational phases - this number is the total number of opportunities for both the authorised Sonvanger Photovoltaic Solar Power Plant and the proposed power line.
VII. Utilisation of significant volumes of local raw materials such as water, wood etc.		×		None.

VIII. Job creation		×		Approximately 800 employment opportunities will be created during the construction phase and 55 during the operational phases - this number is the total number of opportunities for both the authorised Sonvanger Photovoltaic Solar Power Plant and the proposed power line.
IX. Traffic generation		×		Minimal traffic will be generated during the construction and operation phases. With the location of the grid connection corridor adjacent to the R30 readily access is available to the grid connection corridor.
X. Soil erosion	×			The servitude of the power line will need to be cleared or graded to a limited extent, which may potentially result in a degree of dust being created, increased runoff and potentially soil erosion. The time that these areas are left bare will be limited to the construction phase, since vegetation will be allowed to grow back after construction.
XI. Installation of additional bulk telecommunication transmission lines or facilities		×		None.
3. Is the proposed project located near the following?				
I. A river, stream, dam or wetland	×			The Wetland and Riparian Impact Assessment (Appendix D2) identified two wetland types present within the grid connection corridor, which includes valleybottom wetlands and depressions. Other drainage features present includes channels (rivers) and riparian woodland. Drainage occurs as sheet-wash into the drainage channels in the corridor that drains into the major river namely the Palmietkuil Spruit and Bosluis Spruit along the periphery of the powerline corridor as well as the Krom Spruit to the south-east of the corridor.

II. A conservation or open space area		✕		None.
III. An area that is of cultural importance		✕		None.
IV. A site of geological significance		✕		None.
V. An area of outstanding natural beauty		✕		None.
VI. Highly productive agricultural land	✕			The northern section of the grid connection corridor crosses croplands / ploughed lands or homogenous stands of maize on sandy soils.
VII. A tourist resort		✕		None.
VIII. A formal or informal settlement		✕		None.

6.1.2 Matrix analysis

The matrix describes the relevant listed activities, the aspects of the development that will apply to the specific listed activity, a description of the environmental issues and potential impacts, the significance and magnitude of the potential impacts and possible mitigation measures. The matrix also highlights areas of particular concern (see Table 6.2) for more in-depth assessment. An indication is provided of the specialist studies which were conducted and that informed the initial assessment. Each cell is evaluated individually in terms of the nature of the impact, duration and its significance – should no mitigation measures be applied. This is important since many impacts would not be considered significant if proper mitigation measures were implemented.

In order to conceptualise the different impacts, the matrix specify the following:

- **Stressor**: Indicates the aspect of the proposed activity, which initiates and cause impacts on elements of the environment.
- **Receptor**: Highlights the recipient and most important components of the environment affected by the stressor.
- **Impacts**: Indicates the net result of the cause-effect between the stressor and receptor.
- **Mitigation**: Impacts need to be mitigated to minimise the effect on the environment.

Please refer to **Annexure G** for a more in-depth assessment of the potential environmental impacts.

Table 6.2: Matrix analysis

For ease of reference the significance of the impacts is colour-coded as follow:

Low significance	Medium significance	High significance	Positive impact

LISTED ACTIVITY (The Stressor)	ASPECTS OF THE DEVELOPMENT /ACTIVITY	POTENTIAL IMPACTS			SIGNIFICANCE AND MAGNITUDE OF POTENTIAL IMPACTS							MITIGATION OF POTENTIAL IMPACTS			SPECIALIST STUDIES / INFORMATION
			Receptors	Impact description / consequence	Minor	Major	Extent	Duration	Probability	Reversibility	Irreplaceable loss of resources	Possible Mitigation	Possible mitigation measures	Level of residual risk	
CONSTRUCTION PHASE															
Activity 11(i) (GN.R. 327): *"The development of facilities or infrastructure for the transmission and distribution of electricity outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts."* Activity 12(ii)(a)(c) (GN.R. 327): *"The development of (ii) infrastructure or structures with a physical footprint of 100 square meters or more (a) within a watercourse or (b) within 32 meters of a watercourse, measured from the edge of a watercourse."* Activity 19 (GN.R. 327): *"The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil sand, shells, shell grit, pebbles or rock of more than 10 cubic meters from a watercourse"* Activity 27 (GN.R. 327): *"The clearance of 1 hectares or more, but less than 20 hectares of indigenous*	Site clearing and preparation The proposed 132kV power line will connect the proposed 132kV substation to the existing Oryx-Joel 132kV power line. Power line tower footprints and the substation footprint will need to be cleared of vegetation and some areas may need to be levelled. Civil works The main civil works are: • Tower pegging • Terrain levelling if necessary– levelling will be minimal as the potential site chosen is relatively flat. • Construction of foundations for pylons. • Construction of the substation foundation • Assembly and erection of towers. • Stringing of conductors. • Installation of the substation components.	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	• Direct habitat destruction • Habitat fragmentation • Increased soil erosion and sedimentation • Soil and water pollution • Air pollution • Spread and establishment of alien invasive species • Negative effect of human activities and road mortalities		-	P	L	D	PR	ML	Yes	- See Table 6.3	L	Terrestrial Biodiversity, Animal and Plant Species Impact Assessment
			Avifauna	• Displacement of priority avian species from important habitats • Displacement of resident avifauna through increased disturbance • Loss of important avian habitat		-	L	S	Pr	PR	ML	Yes	- See Table 6.3	L	Avifauna Impact Assessment (preliminary desktop assessment)
			Air	• Air pollution due to construction activities and the increase of traffic of construction vehicles.	-		S	S	D	CR	NL	Yes	- Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers.	L	-
			Soil	• Loss of topsoil in disturbed areas, causing a decline in soil		-	S	S	Pr	PR	M	Yes	- Areas which are not to be constructed on within two months must not be	M	-

vegetation." Activity 4(b)(i)(bb)(ee) (GN.R. 324): *"The development of a road wider than 4 meters with a reserve less than 13,5m (b) in the Free State Province (i) outside urban areas within (ee) Critical Biodiversity Areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans."* Activity 12(b)(i)(ii)(iv) (GN.R 324): *"The clearance of an area of 300 square meters or more of indigenous vegetation in the (b) Free State (i) within critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA, or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004, (ii) within critical biodiversity areas identified in bioregional plans and (iv) areas within a watercourse or wetland, or within 100 metres from the edge of a watercourse or wetland."* Activity 14(ii)(a)(c)(b)(i)(ff) (GN.R 324): "*The development of (ii) infrastructure or structures with a physical footprint of 10 square metres or more, where such development occurs (a) within a watercourse, or (c) within 32 meters of a watercourse, measure from the edge of a watercourse, within (b) the Free State, (i) outside urban*				fertility. • Soil erosion caused by alteration of the surface characteristics.									cleared to reduce erosion risks. - The necessary silt fences and erosion control measures must be implemented in areas where these risks are more prevalent. - Vehicles and equipment shall be serviced regularly to avoid the contamination of soil from oil and hydraulic fluid leaks etc.		
			Geology	• Collapsible soil. • Seepage. • Active soil (high soil heave). • Erodible soil. • Hard/compact geology. If the bedrock occurs close to surface it may present problems. • The presence of undermined ground. • Instability due to soluble rock. • Steep slopes or areas of unstable natural slopes. • Areas subject to seismic activity. • Areas subject to flooding.		-	S	S	Pr	CR	NL	Yes	- The most effective mitigation will be the minimisation of the project footprint by using the existing infrastructure as much as possible. - If an activity will mechanically disturb below surface levels in any way, then any available topsoil should first be stripped from the entire surface and stockpiled for re-spreading during rehabilitation. - Retention of vegetation where possible to avoid soil erosion.	L	-
			Existing services infrastructure	• Generation of waste that needs to be accommodated at a licensed landfill site. • Generation of sewage that needs to be accommodated by the local sewage plant. • Increase in construction vehicles on existing roads.	-		L	S	D	CR	NL	Yes	-	L	Confirmation from the Local Municipality
			Surface water	• Impact on the characteristics of		-	L	S	Po	PR	ML	Yes	- See Table 6.3	M	Riparian / Wetland Impact

areas, within (ff) critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans."				the watercourse due to construction within the flood line zone. • Soil compaction and increased risk of sediment transport and erosion. • Soil and water pollution. • Spread and establishment of alien invasive species.											Assessment
		SOCIAL/ECONOMIC ENVIRONMENT	Local unemployment rate	• Job creation. • Business opportunities. • Skills development.		+	P	S	D	I	N/A	Yes	- Where reasonable and practical, the service providers should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories.	L	-
			Visual landscape	• Visual impact of construction activities on sensitive visual receptors in close proximity to the proposed power line	-		L	S	D	PR	NL	Yes	- - See Table 6.3	L	Visual Impact Assessment
			Traffic volumes	• Increase in construction vehicles.	-		P	S	Pr	CR	NL	Yes	The development may commence without influencing the levels-of-service for the local road network. However, some remedial work is recommended on the gravel road leading to the site. Remedial work should take place before the construction starts.	L	-
			Health & Safety	• Air/dust pollution. • Road safety. • Impacts associated with the presence of construction workers on site and in the area. • Influx of job seekers to the area. • Increased safety risk to farmers, risk of stock theft and damage to farm infrastructure associated with presence of construction workers on the site. • Increased risk of veld fires.	-		L	S	Pr	PR	ML	Yes	- Contractor to ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. - It is recommended that no construction workers, with the exception of security personnel,	M	-

													should be permitted to stay over-night on the site.		
			Noise levels	• The generation of noise as a result of construction vehicles, the use of machinery such as drills and people working on the site.	-		L	S	D	CR	NL	Yes	- During construction care should be taken to ensure that noise from construction vehicles and plant equipment does not intrude on the surrounding residential areas. Plant equipment such as generators, compressors, concrete mixers as well as vehicles should be kept in good operating order and where appropriate have effective exhaust mufflers.	L	-
			Tourism industry	• Since there are no tourism facilities in close proximity to the corridor, the proposed activities are not expected not have an impact on tourism in the area.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Heritage resources (including archaeology & palaeontology)	• No potential cultural or heritage resources were identified on or around the grid connection corridor.	-		S	S	U	BR	NL	Yes	- Any discovered artifacts shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits shall be obtained from the SAHRA should the proposed site affect any world heritage sites or if any heritage sites are to be destroyed or altered. - A Fossil Finds Procedure must be implemented.	L	Heritage Screening Study
OPERATIONAL PHASE															
<u>Activity 11(i) (GN.R. 327):</u> *"The development of facilities or infrastructure for the transmission and distribution*	<u>Connection to the grid</u> - The proposed 132 kV overhead power line will be approximately 22km long and will be constructed within	AL ENVIRONM	Fauna & Flora	• No impacts have been identified by the specialist for the operation phase.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Terrestrial Biodiversity, Animal and Plant Species

of electricity outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts."	the identified grid connection corridor to connect the authorised Sonvanger PV solar Power Plant to the natonal grid. The structure to be utilised for the power line towers will be informed by the local geotechnical and topographical conditions as well as by specific requirements from Eskom. This new power line will connect the SPP to the existing Oryx-Joel 132kV power line located at the Beatrix Mine (Sibanye Stillwater). For this Basic Assessment a larger grid connection corridor has been identified within which the power line route will be placed. The corridor is 200m wide and 22km in length; and was assessed within this BA Report. A 132kV substation (1ha in extent) and service road associated with the power line is also included as part of the development (required associated infrastructure). The grid connection corridor is located directly to the west of the town of Theunissen (along the R30 Regional Road). This connection will enable the evacuation of the generated electricity into the national grid.													
														Impact Assessment
			Avifauna	• Displacement of priority avian species from important habitats • Displacement of resident avifauna through increased disturbance • Collision when flying into power line infrastructure • Electrocution when perched on power line infrastructure		-	L	L	PR	PR	ML	Yes	- See Table 6.4	M	Avifauna Impact Assessment (preliminary desktop assessment)
			Air quality	• The proposed development will not result in any air pollution during the operational phase.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Soil	• Loss of agricultural land use caused by direct occupation of land. • Soil Erosion caused by alteration of the surface characteristics		-	L	L	D	PR	SL	Yes	- An effective system of run-off control should be implemented, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. - Avoid stripping land surfaces of existing vegetation by only allowing vehicles to travel on existing roads and not create new roads.	L	-
			Geology	• Collapsible soil. • Seepage (shallow water table). • Active soil (high soil heave). • Erodible soil. • Hard/compact geology. If the bedrock occurs close to surface it may present problems when driving solar panel columns. • The presence of undermined ground. • Instability due to soluble rock. • Steep slopes or areas of unstable natural slopes. • Areas subject to seismic activity. • Areas subject to flooding.		-	S	S	Po	PR	ML	Yes	- Surface drainage should be provided to prevent water ponding. - Mitigation measures proposed by the detailed engineering geological investigation should be implemented.	L	-

			Surface water	• Impact associated with the development are limited to the construction phase and therefore not applicable to the operation phase.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Riparian / Wetland Impact Assessment
		SOCIAL/ECONOMIC ENVIRONMENT	Visual landscape	• Potential visual impacts on sensitive visual receptors located within a 5km radius. • Potential visual impacts on sensitive visual receptors in the region (5-10km) • Visual and sense of place impacts		-	L	L	PR	PR	NL	Yes	-See Table 6.4	M	Visual Impact Assessment
			Traffic volumes	• The proposed development will not result in any traffic impacts during the operational phase.	-		L	L	Po	CR	NL	Yes	-	L	-
			Health & Safety	• The proposed development will not result in any health and safety impacts during the operational phase.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Noise levels	• The proposed development will not result in any noise pollution during the operational phase.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Tourism industry	• Since there are no tourism facilities in close proximity to the corridor, the proposed activities are not expected not have an impact on tourism in the area.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Heritage resources (including archaeology & palaeontology)	• It is not foreseen that the proposed activity will impact on heritage resources or vice versa.	-		S	L	U	PR	NL	Yes	-	L	Heritage Screening Study
			Electricity supply	• Generation of additional electricity. The power line will enable the evacuation of solar electricity that will be fed into the grid.	+		I	L	D	I	N/A	Yes	-	N/A	-
			Electrical infrastructure	• Additional electrical infrastructure. The proposed power line and substation will add to the existing electrical infrastructure and aid to lessen the reliance of electricity	+		I	L	D	I	N/A	Yes	-	N/A	-

				generation from coal-fired power stations.											
			Electrical infrastructure	• Additional electrical infrastructure. The proposed power line and substation and the solar facility which it will cater for will add to the existing electrical infrastructure and aid to lessen the reliance of electricity generation from coal-fired power stations.	+		I	L	D	I	N/A	Yes	-	N/A	-
DECOMMISSIONING PHASE															
(-	<u>Dismantlement of infrastructure:</u> During the decommissioning phase the power line and substation will be dismantled. <u>Rehabilitation of biophysical environment:</u> The biophysical environment will be rehabilitated	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	• Direct habitat destruction • Habitat fragmentation • Increased soil erosion and sedimentation • Soil and water pollution • Air pollution • Spread and establishment of alien invasive species • Negative effect of human activities and road mortalities	-		L	S	D	PR	ML	Yes	- See Table 6.4	L	Terrestrial Biodiversity, Animal and Plant Species Impact Assessment
			Avifauna	• Displacement of priority avian species from important habitats • Displacement of resident avifauna through increased disturbance	-		S	S	Po	CR	NL	Yes	- See Table 6.4	L	Avifauna Impact Assessment (preliminary desktop assessment)
			Air quality	• Air pollution due to the increase of traffic of construction vehicles.	-		S	S	D	CR	NL	Yes	- Regular maintenance of equipment to ensure reduced exhaust emissions.	L	-
			Soil	• Soil degradation, including erosion. • Disturbance of soils and existing land use (soil compaction). • Physical and chemical degradation of the soils by construction vehicles (hydrocarbon spills).		-	S	S	Pr	PR	M	Yes	- Re-vegetation of affected areas must be made a priority to avoid erosion. - Mitigation measures for the construction phase will apply.	M	-
			Geology	• It is not foreseen that the decommissioning phase will impact on the geology of the site or vice versa.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Existing services	• Generation of waste that need		-	L	S	D	I	NL	Yes	-	L	-

			infrastructure	to be accommodated at a licensed landfill site. • Generation of sewage that need to be accommodated by the municipal sewerage system and the local sewage plant. • Increase in construction vehicles.										
			Ground water	• Pollution due to construction vehicles.	-		S	S	Pr	CR	ML	Yes	-Make use of appropriate drip trays for the repairing and servicing of vehicles.	L	-
			Surface water	• Increase in storm water run-off. • Pollution of water sources due to soil erosion.	-		L	S	Po	PR	ML	Yes	- Removal of any historically contaminated soil as hazardous waste. - Removal of hydrocarbons and other hazardous substances by a suitable contractor to reduce contamination risks. - Removal of all substances which can result in groundwater (or surface water) contamination.	L	-
		SOCIAL/ECONOMIC ENVIRONMENT	Visual landscape	• Visual impact of construction activities on sensitive visual receptors in close proximity to the proposed power line	-		L	S	D	PR	NL	Yes	- See Table 6.3	L	Visual Impact Assessment
			Traffic volumes	• Increase in construction vehicles.	-		L	S	Pr	CR	NL	Yes	- Movement of heavy construction vehicles through residential areas should be timed to avoid peak morning and evening traffic periods. In addition, movement of heavy construction vehicles through residential areas should not take place over weekends.	L	-
			Health & Safety	• Air/dust pollution. • Road safety. • Increased crime levels. The presence of construction	-		L	S	Pr	PR	ML	Yes	- Demarcated routes to be established for construction vehicles to ensure the safety of	L	-

				workers on the site may increase security risks associated with an increase in crime levels as a result of influx of people in the rural area.									communities, especially in terms of road safety and communities to be informed of these demarcated routes. - Where dust is generated by trucks passing on gravel roads, dust mitigation to be enforced. - Any infrastructure that would not be decommissioned must be appropriately locked and/or fenced off to ensure that it does not pose any danger to the community.		
			Noise levels	• The generation of noise as a result of construction vehicles, the use of machinery and people working on the site.	-		S	S	D	CR	NL	Yes	- The decommissioning phase must aim to adhere to the relevant noise regulations and limit noise to within standard working hours in order to reduce disturbance of dwellings in close proximity to the development.	L	-
			Tourism industry	• Since there are no tourism facilities in close proximity to the site, the decommissioning activities will not have an impact on tourism in the area.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Heritage resources (including archaeology & palaeontology)	• It is not foreseen that the decommissioning phase will impact on any heritage resources.	-		S	S	U	PR	NL	Yes	-	L	Heritage Screening Study

Nature of the impact:	(N/A) No impact	(+) Positive Impact	(-) Negative Impact		
Geographical extent:	(S) Site;	(L) Local/District;	(P) Province/Region;	(I) International and National	
Probability:	(U) Unlikely;	(Po) Possible;	(Pr) Probable;	(D) Definite	
Duration:	(S) Short Term;	(M) Medium Term;	(L) Long Term;	(P) Permanent	
Intensity / Magnitude:	(L) Low;	(M) Medium;	(H) High;	(VH) Very High	
Reversibility:	(CR) Completely Reversible;	(PR) Partly Reversible;	(BR) Barely Reversible;	-	
Irreplaceable loss of resources:	(IR) Irreversible	(NL) No Loss;	(ML) Marginal Loss;	(SL) Significant Loss;	(CL) Complete Loss
Level of residual risk:	(L) Low;	(M) Medium;	(H) High;	(VH) Very High	-

The EMPrs for the power line and substation are included in Appendix F

6.2 KEY ISSUES IDENTIFIED

From the above it is evident that mitigation measures should be available for potential impacts associated with the proposed activity and development phases. The scoping methodology identified the following key issues which were addressed in more detail in the BA report – refer to the significance assessment attached as Appendix E1 to the report.

6.2.1 Impacts during the construction phase

During the construction phase the following activities will have various potential impacts on the biophysical and socio-economic environment:

- Activity 11(i) (GN.R. 327): *"The development of facilities or infrastructure for the transmission and distribution of electricity outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts."*

- Activity 12(ii)(a)(c) (GN.R. 327): "*The development of (ii) infrastructure or structures with a physical footprint of 100 square meters or more (a) within a watercourse or (b) within 32 meters of a watercourse, measured from the edge of a watercourse."*

- Activity 19 (GN.R. 327): "*The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil sand, shells, shell grit, pebbles or rock of more than 10 cubic meters from a watercourse"*

- Activity 27 (GN.R. 327): *"The clearance of 1 hectares or more, but less than 20 hectares of indigenous vegetation."*

- Activity 4(b)(i)(bb)(ee) (GN.R. 324): *"The development of a road wider than 4 meters with a reserve less than 13,5m (b) in the Free State Province (i) outside urban areas within (ee) Critical Biodiversity Areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans."*

- Activity 12(b)(i)(ii)(iv) (GN.R 324): *"The clearance of an area of 300 square meters or more of indigenous vegetation in the (b) Free State (i) within critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA, or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004, (ii) within critical biodiversity areas identified in bioregional plans and (iv) areas within a watercourse or wetland, or within 100 metres from the edge of a watercourse or wetland."*

- Activity 14(ii)(a)(c)(b)(i)(ff) (GN.R 324): "*The development of (ii) infrastructure or structures with a physical footprint of 10 square metres or more, where such development occurs (a) within a watercourse, or (c) within 32 meters of a watercourse, measure from the edge of a watercourse, within (b) the Free State, (i) outside urban areas, within (ff) critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans."*

During the construction phase minor negative impacts are foreseen over the short term. The latter refers to a period of months. Table 6.3 summarises the potentially most significant impacts and the mitigation measures that are proposed during the construction phase.

Table 6.3: Impacts and the mitigation measures during the construction phase

SPECIALIST STUDY	IMPACT	PRE-MITIGATION RATING	POST MITIGATION RATING	SUMMARY OF MITIGATION MEASURES
Terrestrial Biodiversity, Animal and Plant Species Impact Assessment	Direct habitat destruction	Negative High	Negative Medium	• The removal of indigenous flora should be kept to a minimum necessary. Trim, rather than fell of woody species along the edges of the development site where possible. The clearing and damage of plant growth in the riparian and wetland areas should be restricted to the actual crossing where possible, and not into the sensitive adjacent areas. Where protected flora will need to be cleared or pruned, permits should be obtained from the relevant authority. • Peripheral impacts around the development corridor on the surrounding vegetation of the area should be avoided and a monitoring programme should be implemented to ensure the impacts are kept to a minimum, while the rehabilitation of the power line route should be prioritized after construction has been completed. • During construction, sensitive habitats must be avoided by construction vehicles and equipment, wherever possible, to reduce potential impacts. Only necessary damage must be caused and, for example, unnecessary driving around in the veld or bulldozing natural habitat must not take place. • An avifauna specialist should be consulted to conduct a specialist study for the project area and monitoring of the potential impact of the powerline in the future. • All development activities should be restricted to specific recommended areas. The Environment Control Officer (ECO) should control these areas. Storage of equipment, fuel and other materials should be limited to demarcated areas. Layouts should be adapted to fit natural patterns rather than imposing rigid geometries. The entire development footprint should be clearly demarcated

				prior to initial site clearance and prevent construction personnel from leaving the demarcated area. This would only be applicable to the construction phase of the proposed development. • The ECO should advise the construction team in all relevant matters to ensure minimum destruction and damage to the environment. The ECO should enforce any measures that he/she deem necessary. Regular environmental training should be provided to construction workers to ensure the protection of the habitat, fauna and flora and their sensitivity to conservation. • Where holes for poles pose a risk to animal safety, they should be adequately cordoned off to prevent animals falling in and getting trapped and/or injured. This could be prevented by the constant excavating and backfilling during planting of the poles along the lines. • Poisons for the control of problem animals should rather be avoided since the wrong use thereof can have disastrous consequences for the raptors occurring in the area. The use of poisons for the control of rats, mice or other vermin should only be used after approval from an ecologist. • Limit pesticide use to non-persistent, immobile pesticides and apply in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications. • Monitoring should be implemented during the construction phase of the development to ensure that minimal impact is caused to the fauna and flora of the area. • Placement of pylons should be outside sensitive vegetation units, outcrops and drainage channels and wetlands (including the 32m buffer). • A detailed wetland assessment should be conducted to determine the exact edges of potential wetlands and drainage channels.

	Habitat fragmentation	Negative High	Negative Medium	• Use existing facilities (e.g., impacted areas) to the extent possible to minimize the amount of new disturbance. • Ensure protection of important resources by establishing protective buffers to exclude unintentional disturbance. All possible efforts must be made to ensure as little disturbance as possible to the sensitive features such as surrounding woodland and riparian woodland outside the project area during construction. • During construction, sensitive habitats must be avoided by construction vehicles and equipment, wherever possible, to reduce potential impacts. Only necessary damage must be caused and, for example, unnecessary driving around in the veld or bulldozing natural habitat must not take place. • Construction activities must remain within defined construction areas. No construction / disturbance will occur outside these areas.
	Increased soil erosion and sedimentation	Negative High	Negative Medium	• The project should be divided into as many phases as possible, to ensure that the exposed areas prone to erosion are minimal at any specific time. • Cover disturbed soils as completely as possible, using vegetation or other materials. • Minimize the amount of land disturbance and develop and implement stringent erosion and dust control practices. • Protect sloping areas and drainage channel banks that are susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and Work Areas. • Repair all erosion damage as soon as possible to allow for sufficient rehabilitation growth. • Gravel roads to the construction sites must be well drained to limit soil erosion. • Control the flow of runoff to move the water safely off the site without

				destructive gully formation. • Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and Work Areas. • Placement of pylons should be outside sensitive soil types and drainage channels.
	Soil and water pollution	Negative Medium	Negative Low	• Any excess or waste material or chemicals should be removed from the site and discarded in an environmentally friendly way. The ECO should enforce this rule rigorously. • Hazardous chemicals to be stored on an impervious surface protected from rainfall and storm water run-off. • Spill kits should be on-hand to deal with spills immediately. • All vehicles should be inspected for oil and fuel leaks on a regular basis. Vehicle maintenance yards on site should make provision for drip trays that will be used to capture any spills. Drip trays should be emptied into a holding tank and returned to the supplier.
	Air pollution	Negative Medium	Negative Low	• A speed limit should be enforced on dirt roads (preferably 30-40km/h). • Implement standard dust control measures, including periodic spraying (frequency will depend on many factors including weather conditions, soil composition and traffic intensity and must thus be adapted on an on-going basis) of construction areas and access roads, and ensure that these are continuously monitored to ensure effective implementation.
	Spread and establishment of alien invasive species	Negative Medium	Negative Low (negligible)	• Control involves killing the plants present, killing the seedlings which emerge, and establishing and managing an alternative plant cover to limit re-growth and re-invasion. Weeds and invader plants will be controlled in the manner prescribed for that category by the CARA or in terms of Working for Water

				guidelines. The control of these species should even begin prior to the construction phase considering that small populations of these species was observed during the field surveys. • Institute strict control over materials brought onto site, which should be inspected for seeds of noxious plants and steps taken to eradicate these before transport to the site. Routinely fumigate or spray all materials with appropriate low-residual herbicides prior to transport to or in a quarantine area on site. The contractor is responsible for the control of weeds and invader plants within the construction site for the duration of the construction phase. Alien invasive tree species listed by the CARA regulations should be eradicated. • Rehabilitate disturbed areas as quickly as possible to reduce the area where invasive species would be at a strong advantage and most easily able to establish. • Institute a monitoring programme to detect alien invasive species early, before they become established and, in the case of weeds, before the release of seeds. Once detected, an eradication/control programme should be implemented to ensure that the species' do not spread to surrounding natural ecosystems.
	Negative effect of human activities and road mortalities	Negative Medium	Negative Low (negligible)	• No staff should be accommodated on the site. If practical, construction workers should stay in one of the nearby villages / towns and transported daily to the site. • The ECO should regularly inspect the site, including storage facilities and compounds and eradicate any invasive or exotic plants and animals. • Maintain proper firebreaks around entire development footprint. • Educate construction workers regarding risks and correct disposal of cigarettes. • More fauna is normally killed the faster vehicles travel. A speed limit should be

				enforced (preferably 40 km/hour). It can be considered to install speed bumps in sections where the speed limit tends to be disobeyed. (Speed limits will also lessen the probability of road accidents and their negative consequences). • Travelling at night should be avoided or limited as much as possible.
Riparian / Wetland Impact Assessment	Impact on the characteristics of the watercourse due to construction within the flood line zone.	Negative High	Negative Low	• Clearing of vegetation at the crossings for the powerline corridors should be scheduled for the drier winter months and limited to areas immediately needed for construction. Vegetation stripping should occur in parallel with the progress of construction to minimise erosion and/or run-off. Large tracts of bare soil will either cause dust pollution or quickly erode and then cause sedimentation in the lower portions of the catchment. Only selected plant species must be used in the re-vegetation process. • Minimize soil exposure around the powerline development. Re-vegetate exposed areas surrounding the powerline development and allow a sufficient buffer between the cropland development to prevent sedimentation into the wetlands / rivers. • Manage water effectively on, to, within, and from this site. • The location where the powerline crosses the drainage channels should be the least sensitive area. The site should be indicated by an ecologist after consultation by the engineers. The following mitigation measures and management actions should be taken to minimize potential impacts of the line crossing drainage channels: o Identify areas of historic or potential vulnerability, such as geologically unstable materials or areas subject to flooding. o Avoid problematic areas and avoid power line locations in areas of high natural hazard risk, such as landslides, rock-fall areas, steep slopes (over 60-70%), wet areas, saturated soils, etc. o Avoid or minimize construction in narrow canyon bottoms or on flood

				plains of rivers that will inevitably be inundated during major storm events. o Minimize changes to natural drainage patterns and crossings to drainages. Drainage crossings are potentially problematic, so they must be well designed. Changes to natural drainage patterns or channels often result in either environmental damage or failures. o Perform scheduled maintenance to be prepared for storms. Ensure that culverts have their maximum capacity, ditches are cleaned, and that channels are free of debris and brush than can plug structures. o Typically keep cut and fill slopes as flat as possible and well covered (stabilized) with vegetation to minimize slumping as well as minimize surface erosion. Well-cemented but highly erosive soils may best to resist surface erosion with near-vertical slopes that minimize the surface area exposed to erosion. o Use deep-rooted vegetation for biotechnical stabilization on slopes. Use a mixture of good ground cover plus deep-rooted vegetative species, preferably native species, to minimize deep-seated mass instability as well as offer surface erosion control protection. o Locate the power line on narrow sections of rivers and in areas of bedrock where possible. Avoid fine, deep alluvial deposits (of fine sand and silt) that are scour susceptible and problematic, or which otherwise require costly foundations. o Ensure that structural designs for the power line crossing the drainage channels include appropriate design criteria and have good foundations to prevent failures during floods. o Place retaining structures, foundations, and slope stabilization measures into bedrock or firm, in-place material with good bearing capacity to minimize undermining, rather than placing these structures on shallow

				colluvial soil or on loose fill material. • The power line should not negatively impact on the actual riparian area itself, and the pylons should be placed outside any riparian zones. • All development activities should be restricted to the footprint areas of the proposed powerline development. The Environment Site Officer (ESO) should demarcate and control these areas. Storage of building equipment, fuel and other materials should be limited to demarcated areas. Layouts should be adapted to fit natural patterns rather than imposing rigid geometries. • The Environment Control Officer (ECO) should advise the construction team in all relevant matters to ensure minimum destruction and damage to the environment and specifically wetlands. The ECO should enforce any measures that he/she deem necessary. Regular environmental training should be provided to construction workers to ensure the protection of the habitat, fauna and flora and their sensitivity to conservation. • Rehabilitation of the development area after construction have been completed should be considered a high priority and all areas rehabilitated should be audited after construction has ceased by a suitably qualified environmentalist. • Should the development be approved by authorities, environmental monitoring of environmental aspects should be implemented during and after the construction phase of the development to ensure that minimal impact is caused to the floodline or wetlands of the area. • Demarcate all riparian boundaries with pegs and danger tape. • Edge effects of pre-construction and construction activities, including erosion, sedimentation and alien/weed control, need to be strictly managed in wetland areas as well as their associated buffer zones.

				• The following general rehabilitation measures should be implemented in the disturbed riparian zone: o All disturbed surface areas will be re-shaped to resemble the surrounding natural topography. Surfaces will be ripped / scarified, and re-vegetated with indigenous grass species. o As far, as is practical, implement concurrent rehabilitation processes to limit degradation of soil biota. o Terrestrial invasive removal programs must be maintained throughout the proposed development as well as in the aftercare and maintenance phases.
	Soil compaction and increased risk of sediment transport and erosion.	Negative High	Negative Low	• Stringent controls must be put in place to prevent any unnecessary disturbance or compaction of alluvial soils. Compaction of soils should be limited and / or avoided as far as possible. Compaction will reduce water infiltration and will result in increased runoff and erosion. Where any disturbance of the soil takes place (have taken place in the past), these areas must be stabilized and any alien plants which establish should be cleared and follow up undertaken for at least 2 years thereafter and preferably longer. Where compaction becomes apparent, remedial measures must be taken (e.g., "ripping" the affected area). Topsoil should preferably be separated from the subsoil, and topsoil sections should be kept intact as deep as possible. • Reprofiling of the banks of disturbed drainage areas to a maximum gradient of 1:3 to ensure bank stability. • Reinforce banks and drainage features where necessary with gabions, reno mattresses and geotextiles. This is especially relevant for the stormwater outlet area. • Reseed any areas where earthworks have taken place with indigenous grasses to prevent further erosion.

				• Erosion control mechanisms must be established as soon as possible. Further financial provision should be continued over the subsequent years to allow for maintenance of the gabions, reno mattresses, and associated structures. • A stormwater plan must be developed with the aid of an engineer to ensure that water runoff is diverted off the site without pooling and stagnation or erosion. Financial provision for closure will include the estimated costs for erosion control post-construction. • If compaction occurs, rectification can be done by application and mixing of manure, vegetation mulch or any other organic material into the area. Use of well cured manure is preferable as it will not be associated with the nitrogen negative period associated with organic material that is not composted. • Vehicle traffic should not be allowed on the rehabilitated areas, except on allocated roads. It will have a negative impact due to the dispersive/compaction characteristics of soils and its implications on the long term. • Appropriate design and mitigation measures must be developed and implemented to minimise impacts on the natural flow regime of the watercourse i.e., through placement of structures/supports and to minimise turbulent flow in the watercourse. • The indiscriminate use of machinery within the in-stream and riparian habitat will lead to compaction of soils and vegetation and must therefore be strictly controlled. • A buffer zone of 32 meters should be implemented around the drainage channels and riparian zone to prevent sediment changes to the channels. No activities or disturbance may take place within the 32m buffer. • Perform scheduled maintenance to be prepared for storms. Ensure that culverts have their maximum capacity, ditches are cleaned, and that channels

				are free of debris and brush than can plug structures.
	Soil and water pollution.	Negative High	Negative Low	• Ensure that all hazardous storage containers and storage areas comply with the relevant SABS standards to prevent leakage. Regularly inspect all vehicles for leaks. Re-fuelling must take place on a sealed surface area to prevent ingress of hydrocarbons into topsoil. • No dumping of waste should take place within the wetland / riparian zone. If any spills occur, they should be immediately cleaned up. • Appropriate sanitary facilities must be provided for the duration of the proposed development and all waste removed to an appropriate waste facility. • Excess waste or chemicals should be removed from site and discarded in an environmentally friendly way. The ECO should enforce this rule rigorously. • All vehicles should be inspected for oil and fuel leaks on a regular basis. Vehicle maintenance yards on site should make provision for drip trays to capture spills. Drip trays should be emptied into a holding tank and returned to the supplier. • Implement standard dust control measures, including periodic spraying (frequency will depend on many factors including weather conditions, soil composition and traffic intensity and must thus be adapted on an on-going basis) and chemical dust suppressants of construction areas and access roads, and ensure that these are continuously monitored to ensure effective implementation. • A speed limit (preferably 40 km/hour) should be enforced on dirt roads. • Limit pesticide use to non-persistent, immobile pesticides and apply in accordance with the label and application permit directions and stipulations for terrestrial and aquatic applications.

	Spread and establishment of alien invasive species.	Negative High	Negative Low	• Alien and invader vegetation must not be allowed to colonise in the area. Control involves killing alien invasive plants present, seedlings and establishing an alternative plant cover to limit re-growth. The use of indigenous plants must be encouraged in the rehabilitated areas (stormwater canals), and stockpiles containing mostly exotic or weedy species should receive specialised handling and should be invasion. Control should begin prior to construction phase considering small populations of AIS occur around the sites. • Institute strict control over materials brought onto site, which should be inspected for seeds and steps taken to eradicate these before transport to the site. The contractor is responsible for the control of weeds and invader plants. • Rehabilitate disturbed areas as quickly as possible. • Institute a monitoring programme to detect alien invasive species early. • Institute an eradication/control programme for early intervention if invasive species are detected. The use of indigenous plants must be encouraged in the rehabilitated areas (stormwater canals), and stockpiles containing mostly exotic or weedy species should receive specialised handling and should be covered for extended periods to inhibit seedling germination of these species. Active management and eradication of exotic / alien plant species should also occur when seedlings are found.
Avifaunal Impact Assessment (preliminary desktop assessment)	Displacement of priority avian species from important habitats	Negative Medium	Negative Low	• Limit the construction footprint. • Retain indigenous vegetation wherever possible. • Limit access to remainder of area. • Avoid construction during the breeding season (summer). • Laydown areas to be placed only disturbed zones. • Construct in shortest timeframe.

				• Control noise to minimum.
Visual Impact Assessment	Visual impact of construction activities on sensitive visual receptors in close proximity to the proposed power line	Negative Low	Negative Low	• Retain and maintain natural vegetation immediately adjacent to the development footprint. • Ensure that vegetation is not unnecessarily removed during the construction phase. • Plan the placement of laydown areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e., in already disturbed areas) where possible. • Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads. • Ensure that rubble, litter, etc. are appropriately stored (if it can't be removed daily) and then disposed of regularly at a licenced waste site. • Reduce and control dust during construction by utilising dust suppression measures. • Reduce construction activities between 07:00 and 18:00, where possible, in order to reduce the impacts of construction lighting. • Rehabilitate all disturbed areas immediately after the completion of construction work and maintain good housekeeping.
Heritage Impact Assessment	Impacts on heritage objects	Negative Low	Negative Low	• Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. • Implement the Fossil Finds Procedure.
Other	Generation of waste - general waste, construction waste,	Negative Medium	Negative Low	• The Contractor shall install mobile chemical toilets on the site. • Staff shall be sensitised to the fact that they should use these facilities at all

	sewage and grey water.			times. No indiscriminate sanitary activities on site shall be allowed. • Ablution facilities shall be within 30m from workplaces. There should be enough toilets available to accommodate the workforce (minimum requirement 1:15 workers). • Toilets shall be serviced regularly and the ECO shall inspect toilets regularly. • Under no circumstances may open areas, neighbours fences or the surrounding bush be used as a toilet facility. • Construction methods and materials should be carefully considered in view of waste reduction, re-use and recycling opportunities. • Specific areas must be designated on-site for the temporary management of various waste streams. Location of such areas must seek to minimise the potential for impact on the surrounding environment, including prevention of runoff, seepage and vermin control. • Adequate weather and vermin proof waste bins and skips should be placed on site. Separate bins should be provided for general and hazardous waste. • Documentation (waste manifest) must be maintained detailing the quantity, nature and fate of any regulated waste. Waste disposal records must be available for review at any time. • Refuse bins must be placed at strategic positions to ensure that litter does not accumulate within the construction site. • The Contractor shall supply waste collection bins where such is not available and all solid waste collected shall be disposed of at registered/licensed landfill. • A housekeeping team should be appointed to regularly maintain the litter and rubble situation on the construction site.

				• If possible and feasible, all waste generated on site must be separated into glass, plastic, paper, metal and wood and recycled. An independent contractor can be appointed to conduct this recycling. • Littering by the employees of the Contractor shall not be allowed under any circumstances. The ECO shall monitor the neatness of the work sites as well as the Contractor campsite. • Skip waste containers should be maintained on site. These should be kept covered and arrangements made for them to be collected regularly. • All waste must be removed from the site and transported to a landfill site promptly to ensure that it does not attract vermin or produce odours. • Where a registered waste site is not available close to the construction site, the Contractor shall provide a method statement with regard to waste management. • A certificate of disposal shall be obtained by the Contractor and kept on file, if relevant. • Under no circumstances may solid waste be burnt on site. • All waste must be removed promptly to ensure that it does not attract vermin or produce odours
	Creation of local employment and business opportunities, skills development and training	Positive Low	Positive Medium	• Strategies need to be identified by the local municipality and the business sectors in order to maximise the potential benefits associated with the establishment. • Efforts should be made to employ local contractors first and contractors that are compliant with the Broad Based Black Economic Empowerment (BBBEE) criteria. • Gender equality should also be promoted. If possible, a training and skills

				development programme for the local workers should be initiated prior to the construction phase.
	Technical support to local farmers and municipalities	Negative Low	Positive Low	• Private consultation sessions with local farmers can be held to inform them about the installation of solar energy facilities, the benefits thereof, the process and costs. • Workshops can also be held for the local farmers as well as the local municipality to also advise them regarding the installation of SPPs (and the associated infrastructure) and the process and costs thereof.
	Potential loss of productive farmland	Negative Medium	Negative Low	• Development footprint needs to be fenced off prior to the construction phase and all construction related activities should be confined in this fenced off area. Livestock grazing on the proposed site need to be relocated.
	In-migration or influx of job seekers.	Negative Medium	Negative Low	• A policy that no employment will be available at the gate should be implemented. Job seekers from the local community should be employed first.
	Presence of construction workers on the local communities	Negative Medium	Negative Low	• The proposed site should be fenced off and the movement of construction workers should be limited to the vicinity of the site. • Transportation for the construction workers need to be arranged by the contractor to ensure that there will be no trespassing of properties by any staff. Necessary arrangements to enable workers to return to their hometowns over weekends should also be arranged in order to reduce the risks posed to local family structures and social networks. No staff should be accommodated overnight on site, except for security staff. Contractors need to ensure that all workers sign a code of conduct before the construction phase starts, which are drawn up in accordance with the South African labour legislation. By doing this, workers will be legally informed of the associated risks on the property and that they would be held liable for any damages or losses. This code of conduct should also outline the acceptable behaviour an activities of construction workers.

	Heavy vehicles and construction activities	Negative Low	Negative Low	• With regards to all safety measures, the drivers of the vehicles must be qualified and all vehicles must be road worthy. • Drivers should also be made aware of the strict speed limits on and off site and the potential road safety issues on site. • The contractor must repair any damages to the gravel roads on the site, during the construction phase, and any cost with regards to the repair of the roads must be borne by the contractor.
	Risk to safety, livestock and farm infrastructure.	Negative Low	Negative Low	• The proposed site should be fenced off and the movement of construction workers should be limited to the vicinity of the site. • Contractors need to ensure that all workers sign a code of conduct before the construction phase starts, which are drawn up in accordance with the South African labour legislation. By doing this, workers will be legally informed of the associated risks on the property and that they would be held liable for any damages or losses. • Any form of theft, damaged infrastructure and trespassing will lead to immediate dismissal and the workers would be held liable for the costs thereof.
	Increased risk of veld fires.	Negative Medium	Negative Low	• A firebreak should be implemented before the construction phase. The firebreak should be controlled and constructed around the perimeters of the project site. • Adequate fire-fighting equipment should be provided and readily available on site and all staff should be trained in fire-fighting and how to use the fire-fighting equipment. • The contractor should ensure that no open fires are allowed on site. The use of cooking or heating implements should only be used in designated areas. • Contractors need to ensure that any construction related activities that might

				pose potential fire risks, are done in the designated areas where it is also managed properly.

6.2.2 Impacts during the operational phase

During the operational phase the grid connection corridor will serve a 132kV single-circuit power line and substation. The potential impacts will take place over a period of 20 – 30 years. Table 6.4 summarised the negative impacts are generally associated with the power line and substation, which include impacts on the avifauna, soils, geology, surface water, the pressure on existing services infrastructure, and visual impacts. The provision of sustainable services delivery also needs to be confirmed. The operational phase will have a direct positive impact through the provision of employment opportunities for its duration, and the generation of income to the local community.

During the operational phase the following activities will have various potential impacts on the biophysical and socio-economic environment:

- Activity 11(i) (GN.R. 327): *"The development of facilities or infrastructure for the transmission and distribution of electricity outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts."*

Table 6.4: Impacts and the mitigation measures during the operational phase

SPECIALIST STUDY	IMPACT	PRE-MITIGATION RATING	POST MITIGATION RATING	SUMMARY OF MITIGATION MEASURES
Avifaunal (preliminary desktop assessment)	Collision when flying into power line infrastructure	Negative Very High	Negative Medium	• Undertake a walk-through after pole positions are determined to demarcate sections requiring bird deterrents/flappers. • Install flappers on all required sections of power lines (as directed by avifaunal specialist) on or directly adjacent to site. • Undertake quarterly fatality monitoring.
	Electrocution when perched on power line infrastructure	Negative High	Negative Medium	• Pole designs to discourage bird perching and to be signed off by avifaunal specialist. • Undertake quarterly fatality monitoring.
Visual Impact Assessment	Potential visual impacts on sensitive visual receptors located within a 5km radius.	Negative Medium	Negative Medium	• Retain/re-establish and maintain natural vegetation under the power line. • Maintain the general appearance of the power line corridor/servitude
	Potential visual impacts on sensitive visual receptors in the region (5-10km)	Negative Low	Negative Low	• Retain/re-establish and maintain natural vegetation under the power line. • Maintain the general appearance of the power line corridor/servitude

	Visual and sense of place impacts	Negative Low		Negative Low		• The subjectivity towards the project in its entirety can be influenced by creating a "Green Energy" awareness campaign, educating the local community and potentially tourists on the benefits of renewable energy. This can be achieved by also hosting an 'open day' where the local community can have the opportunity to view the completed project which may enlist a sense of pride in the renewable energy project in their area. • Maintain good housekeeping measures.
Other	Soil erosion	Negative Low		Negative Low		• There are no additional mitigation measures required, over and above what has already been included in the Generic EMPr for overhead electricity transmission and distribution infrastructure and substation infrastructure as per Government Notice 435, which was published in Government Gazette 42323 on 22 March 2019.
	Local employment and business opportunities, skills development and training	Positive Low		Positive Medium		• If possible, a training and skills development programme for the local workers should be initiated prior to the operational phase.
	Potential loss of productive farmland	Negative Low		Negative Low		• Establish a rehabilitation fund. This fund can be utilised for the rehabilitation of the proposed project in the decommissioning phase.
	Change in the sense of place	Negative Low	Positive Low	Negative Low	Positive Low	• Due to the height of the power line and extent of the project, no viable mitigation measures can be implemented to eliminate the visual impact of the

				power line, but the subjectivity towards the project in its entirety can be influenced by creating a "Green Energy" awareness campaign, educating the local community and potentially tourists on the benefits of renewable energy.
	Development of infrastructure for the generation of clean, renewable energy	Positive Medium	Positive Medium	• Utilise the proposed solar power plant and the associated grid connection infrastructure to promote and increase South Africa's contributions of renewable energy to the national energy supply grid.

6.2.3 Impacts during the decommissioning phase

The physical environment will benefit from the closure of the power line and substation since the Sonvanger Photovoltaic Solar Power Plant will be restored to its natural state. Table 6.5 provides a summary of the impacts during the decommissioning phase. The decommissioning phase will however potentially result in impact on soils, pressure on existing service infrastructure, surface water and the loss of permanent employment. Skilled staff will be eminently employable and a number of temporary jobs will also be created in the process. Decommissioning of a PV facility, and the associated grid connection infrastructure, will leave a positive impact on the habitat and biodiversity in the area as the area will be rehabilitated to its natural state.

Table 6.5: Impacts and the mitigation measures during the decommissioning phase

SPECIALIST STUDY	IMPACT	PRE-MITIGATION RATING	POST MITIGATION RATING	SUMMARY OF MITIGATION MEASURES
Ecological Fauna and Flora Habitat Survey	Direct habitat destruction	Negative High	Negative Medium	• The removal of indigenous flora should be kept to a minimum necessary. Trim, rather than fell of woody species along the edges of the development site where possible. The clearing and damage of plant growth in the riparian and wetland areas should be restricted to the actual crossing where possible, and not into the sensitive adjacent areas. Where protected flora will need to be cleared or pruned, permits should be obtained from the relevant authority. • Peripheral impacts around the development corridor on the surrounding vegetation of the area should be avoided and a monitoring programme should be implemented to ensure the impacts are kept to a minimum, while the rehabilitation of the power line route should be prioritized after construction has been completed. • Sensitive habitats must be avoided by construction vehicles and equipment, wherever possible, to reduce potential impacts. Only necessary damage must be caused and, for example, unnecessary driving around in the veld or bulldozing natural habitat must not take place. • All development activities should be restricted to specific recommended areas. Storage of equipment, fuel and other materials should be limited to demarcated areas. Layouts should be adapted to fit natural patterns rather than imposing rigid geometries. The entire development footprint should be clearly demarcated prior to initial site clearance and prevent construction personnel from leaving the demarcated area. This would only be applicable to the construction phase of the proposed

				development. • The ECO should advise the team in all relevant matters to ensure minimum destruction and damage to the environment. The ECO should enforce any measures that he/she deem necessary. Regular environmental training should be provided to construction workers to ensure the protection of the habitat, fauna and flora and their sensitivity to conservation. • Where holes for poles pose a risk to animal safety, they should be adequately cordoned off to prevent animals falling in and getting trapped and/or injured. This could be prevented by the constant excavating and backfilling during planting of the poles along the lines. • Poisons for the control of problem animals should rather be avoided since the wrong use thereof can have disastrous consequences for the raptors occurring in the area. The use of poisons for the control of rats, mice or other vermin should only be used after approval from an ecologist. • Limit pesticide use to non-persistent, immobile pesticides and apply in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications. • Monitoring should be implemented to ensure that minimal impact is caused to the fauna and flora of the area.
	Habitat fragmentation	Negative High	Negative Medium	• Use existing facilities (e.g., impacted areas) to the extent possible to minimize the amount of new disturbance. • Ensure protection of important resources by establishing protective buffers to exclude unintentional disturbance. All possible efforts must be made to ensure as little disturbance as possible to the sensitive features such as surrounding woodland and riparian woodland outside the

				project area during construction. • Sensitive habitats must be avoided by construction vehicles and equipment, wherever possible, to reduce potential impacts. Only necessary damage must be caused and, for example, unnecessary driving around in the veld or bulldozing natural habitat must not take place. • Construction activities must remain within defined construction areas. No construction / disturbance will occur outside these areas.
	Increased soil erosion and sedimentation	Negative High	Negative Medium	• Cover disturbed soils as completely as possible, using vegetation or other materials. • Minimize the amount of land disturbance and develop and implement stringent erosion and dust control practices. • Protect sloping areas and drainage channel banks that are susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and Work Areas. • Repair all erosion damage as soon as possible to allow for sufficient rehabilitation growth. • Gravel roads to the construction sites must be well drained to limit soil erosion. • Control the flow of runoff to move the water safely off the site without destructive gully formation. • Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and Work Areas.
	Soil and water pollution	Negative Medium	Negative Low	• Any excess or waste material or chemicals should be removed from the site and discarded in an environmentally friendly way.

				• Hazardous chemicals to be stored on an impervious surface protected from rainfall and storm water run-off. • Spill kits should be on-hand to deal with spills immediately. • All vehicles should be inspected for oil and fuel leaks on a regular basis. Vehicle maintenance yards on site should make provision for drip trays that will be used to capture any spills. Drip trays should be emptied into a holding tank and returned to the supplier.
	Air pollution	Negative Medium	Negative Low	• A speed limit should be enforced on dirt roads (preferably 30-40km/h). • Implement standard dust control measures, including periodic spraying (frequency will depend on many factors including weather conditions, soil composition and traffic intensity and must thus be adapted on an on-going basis) of construction areas and access roads, and ensure that these are continuously monitored to ensure effective implementation.
	Spread and establishment of alien invasive species	Negative Medium	Negative Low (negligible)	• Control involves killing the plants present, killing the seedlings which emerge, and establishing and managing an alternative plant cover to limit re-growth and re-invasion. Weeds and invader plants will be controlled in the manner prescribed for that category by the CARA or in terms of Working for Water guidelines. • Institute strict control over materials brought onto site, which should be inspected for seeds of noxious plants and steps taken to eradicate these before transport to the site. Routinely fumigate or spray all materials with appropriate low-residual herbicides prior to transport to or in a quarantine area on site. The contractor is responsible for the control of weeds and invader plants within the construction site for the duration of the construction phase. Alien invasive tree species listed by the CARA regulations should be eradicated. • Rehabilitate disturbed areas as quickly as possible to reduce the area

				where invasive species would be at a strong advantage and most easily able to establish. • Institute a monitoring programme to detect alien invasive species early, before they become established and, in the case of weeds, before the release of seeds. Once detected, an eradication/control programme should be implemented to ensure that the species' do not spread to surrounding natural ecosystems.
	Negative effect of human activities and road mortalities	Negative Medium	Negative Low (negligible)	• No staff should be accommodated on the site. If practical, construction workers should stay in one of the nearby villages / towns and transported daily to the site. • Regularly inspect the site, including storage facilities and compounds and eradicate any invasive or exotic plants and animals. • Educate construction workers regarding risks and correct disposal of cigarettes. • More fauna is normally killed the faster vehicles travel. A speed limit should be enforced (preferably 40 km/hour). • Travelling at night should be avoided or limited as much as possible.
Other	Generation of waste	Negative Medium	Negative Low	• All decommissioned equipment must be removed from site and disposed of at a registered land fill. Records of disposal must be kept.
	Soil erosion	Negative Low	Negative Low	• There are no additional mitigation measures required, over and above what has already been included in the Generic EMPr for overhead electricity transmission and distribution infrastructure and substation infrastructure as per Government Notice 435, which was published in Government Gazette 42323 on 22 March 2019.

6.3 SUMMARY OF RECOMMENDATIONS FROM SPECIALIST STUDIES

To address the key issues highlighted in the previous section the following specialist studies and processes were commissioned:

- Terrestrial Biodiversity, Plant and Animal Species Impact Assessment – conducted by AGES (see Appendix D1).
- Wetland / Riparian Impact Assessment – conducted by AGES (see Appendix D2).
- Avifaunal Impact Assessment (preliminary desktop assessment) – conducted by Agreenco (see Appendix D3).
- A Visual impact assessment - conducted by Phala Environmental Consultants (see Appendix D4).
- A Heritage Screener- conducted by CTS Heritage (see Appendix D5).
- An assessment of the cumulative impacts associated with the proposed development – conducted by the lead consultant, Environamics in conjunction with the project specialists (refer to Section 7 of this report).

The following sections summarise the main findings from the specialist reports in relation to the key issues raised during the scoping phase.

6.3.1 Issue 1: Heritage and archaeological impacts

South Africa's heritage resources comprise a wide range of sites, features, objects and beliefs. According to Section 27(18) of the National Heritage Resources Act (NHRA), No. 25 of 1999, no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site. In accordance with Section 38 of the NHRA, an independent heritage consultant was therefore appointed to conduct a Heritage Impact Assessment (HIA) to determine if any sites, features or objects of cultural heritage significance occur within the proposed site. The main question which needs to be addressed is:

"Will the proposed development impact on any heritage or archaeological artefacts?"

The Heritage Screening Study (Refer to Appendix D5) confirmed the following:

Based on the known archaeological sensitivity of the broader area, as well as the previously disturbed nature of the grid connection corridor along the R30 and the limited footprint anticipated for the proposed power line, it is not anticipated that the proposed development will negatively impact on any significant archaeological resources.

It is noted that there is an existing municipal cemetery located within the grid connection corridor, this is a modern cemetery managed by the municipality which is clearly demarcated. The proposed power line will not impact on this cemetery through the careful placement of pylons and the location of the power line alignment as close to the R30 as possible. While it remains possible that burials may be located outside of the cemetery and within the power line corridor, impact to these sites can be avoided through strategic placement of the pylons.

According to a Desktop Palaeontological Assessment completed by Bamford (2021) for this project, "The proposed site route in the northern section lies on the Quaternary sands, alluvium and calcretes

that are non-fossiliferous unless there are traps for fossils such as paleo-pans or palaeo-springs. No such feature is visible on the satellite imagery. The southern half is on non-fossiliferous dolerite of Jurassic age. Based on this information it is recommended that no palaeontological site visit is required unless fossils are found when excavations for foundations commence." No further studies are required. The implementation of a Fossil Find procedure must be undertaken as part of the EMPr.

From a heritage point of view, it is recommended that the proposed development be allowed to continue.

6.3.2 Issue 2: Ecological Impacts

The potential impact of the proposed development on threatened flora and fauna and sensitive ecological features and areas known to occur in the Free State Province had to be determined. The main question which needs to be addressed is:

"How will the proposed development impact on the ecology?"

The Terrestrial Biodiversity, Plant and Animal Species Impact Assessment (Appendix D1) concludes that the proposed development activities will modify the vegetation and faunal habitats of the corridor to a certain extent varying according to the habitats on the site, although in general the vegetation where the development footprint is planned are classified slightly degraded to completely modified.

It is evident from the distribution of biodiversity, presence of threatened species and sites of scientific interest, that the proposed development has the potential for negative impact on the flora and fauna. This is particularly true of the sensitive vegetation associated with the riverine and wetland ecosystems and the project area.

Many fauna threatened species are grassland and riparian specialists, linked to these habitats either for breeding, feeding or shelter. Major impacts on riverine areas should be avoided wherever possible during construction. Where unavoidable impacts will occur on grassland and riparian zones, strict mitigation measures and legislation should be implemented (licence for eradication of protected plants, IWUL application etc.).

The corridor for the development varies from being in a completely modified to slightly degraded state.

A sensitivity analyses was conducted to identify the most suitable site for the development. From this investigation and ecological surveys, the following main observations was made:

- Most of the natural grassland and microphyllous woodland have a Medium Sensitivity and development can be supported in the area provided certain mitigation measures are implemented. Where the clearance of the vegetation would cause protected plants or other fauna to be removed, permits should be obtained from the relevant authorities.
- The wetlands (including valley bottoms and pans) and riparian zones have a high sensitivity and should be preserved as important fauna and flora habitats.
- The degraded grasslands and exotic bushclumps have a low sensitivity.

Some potential rare fauna may also occur in the area, and specific mitigation measures need to be implemented to ensure that the impact of the development on the species' habitat will be low. Specific mitigation relating to red data fauna includes the following:

- Disturbances in close vicinity of the development (periphery) should be limited to the smallest possible area to protect species habitat.
- Corridors are important to allow fauna to move freely between the areas of disturbance.
- Specific mitigation should be implemented around wetlands and drainage features in the area to prevent negative impacts.

Several potential impacts were identified and assessed. A few of these were assessed as having potentially medium or high significance, including the following:

- Destruction or disturbance to sensitive ecosystems leading to reduction in the overall extent of a particular habitat.
- Increased soil erosion.
- Impairment of the movement and/or migration of animal species resulting in genetic and/or ecological impacts.
- Destruction/permanent loss of individuals of rare, endangered, endemic and/or protected species.
- Soil and water pollution through spillages.
- Establishment and spread of declared weeds and alien invader plants.
- Impacts of human activities on fauna and flora of the area during construction.
- Air pollution through dusts and fumes from construction vehicles (construction phase)

Mitigation measures are provided that would reduce these impacts from a higher to a lower significance, which will then allow for an acceptable level of impact. Furthermore, the proposed layout plan of the development should be consistent with the sensitivity map and recommendations stipulated in this report, and the impact on the sensitive habitats on site should be kept to a minimum.

Provided that the proposed development and layout plan is consistent with the sensitivity map and take all the mitigation measures into consideration stipulated in this report, the planned development can be supported.

6.3.3 Issue 3: Wetland Impacts

The potential impact of the proposed development on wetlands and riparian areas and areas known to occur in the Free State Province had to be determined. The main question which needs to be addressed is:

"How will the proposed development impact on the surface water features?"

Two wetland types were identified namely a valleybottom wetland and depressions (pans and man-made dams) (Appendix D2). The non-perennial channels can be classified as 'River channels',

although these drainage channels are not wetlands in the 'true' sense of the word but should rather be described as water courses as stipulated in the National Water Act. The channels are floodplain river channels. Baseline soil information, landscape profile and vegetation were used to confirm riparian and terrestrial properties within the study area. The impacts associated with the construction site is reflected in the results of the PES assessment which indicates that the riparian zones, wetlands and water courses are 'Moderately Modified'.

The EIS of the drainage system on site are moderate and are ecologically important and sensitive. The biodiversity of these wetlands may be sensitive to flow and habitat modifications. They play a role in moderating the quantity and quality of water of major rivers.

An impact assessment was conducted for the wetlands and riparian zones on site in addition to the mitigation measures recommended to ensure the protection of the riverine ecosystems. Impacts relating to the proposed development on the water courses / riparian zones are as follows:

- Impact on the characteristics of the watercourse i.e., flow regime, habitat, biota, water quality and geomorphology due to construction within floodline zone.
- Soil erosion and sedimentation.
- Water pollution from spillages, vehicle emissions and dust.
- Spread and establishment of alien invasive species in wetlands.

Specific mitigation measures need to be implemented in the areas surrounding the riparian zones and water courses to prevent any negative impacts other than the impacts that will be caused during the clearance of the power line servitude.

Provided that all the mitigation measures and recommendations surrounding the water courses and riparian zones are strictly adhered to (i.e. impacts managed to a low acceptable level) the development of the solar development can be supported.

6.3.4 Issue 4: Avifaunal Impacts

The potential impact of the proposed development on birds known to occur in the Free State Province had to be determined. The main question which needs to be addressed is:

> *"How will the proposed development impact on the avifauna?"*

According to the Avifaunal Study (preliminary desktop assessment - Appendix D3) the proposed power line for the Sonvanger SPP is situated in an area of moderate avifaunal diversity, but has the potential to impact many large, fast-flying and otherwise power line-sensitive species. The findings of this desktop study should only be considered preliminary and will be updated following repeat winter and summer surveys. There are individual impacts that are relatively high, however most can be effectively mitigated through the controls prescribed in this report. The overall mitigated impacts can result in the project having an overall Low-Negative impact rating on avifauna.

6.3.5 Issue 5: Visual Impacts

Due to the extent of the proposed photovoltaic solar plant it is expected that the plant will result in potential visual impacts. The main question which needs to be addressed is:

> *"To what extent will the proposed development be visible to observers and to will the landscape provides any significant visual absorption capacity*"

The Visual Impact Assessment (Refer to Appendix D4) concluded that the significance of the visual impact will remain a "Negative Low Impact". The construction and operational phases of the proposed power line, may have a visual impact on the study area, especially within (but not restricted to) a 5 - 10km radius of the proposed power line. The visual impact will differ amongst places, depending on the distance of the power line. The proposed development is located in a close proximity to other existing Eskom power infrastructure.

Due to the height of the power line (32m), no viable mitigation measures can be implemented to eliminate the visual impact of the power line, but the possible visual impacts can be reduced. A number of mitigation measures have however been proposed regardless of whether or not mitigation measures will reduce the significance of the of the anticipated impacts, they are considered good practice and should be implemented and maintained throughout the construction, operational and decommissioning phases of the project. In terms of possible landscape degradation, the landscape does not appear to have any specific protection or importance. No buffer areas or areas to be avoided are applicable for this development.

6.4 METHOD OF ENVIRONMENTAL ASSESSMENT

The environmental assessment aims to identify the various possible environmental impacts that could results from the proposed activity. Different impacts need to be evaluated in terms of its significance and in doing so highlight the most critical issues to be addressed.

Significance is determined through a synthesis of impact characteristics which include context and intensity of an impact. Context refers to the geographical scale i.e. site, local, national or global whereas intensity is defined by the severity of the impact e.g. the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence. Significance is calculated as shown in Table 6.6.

Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

6.4.1 Impact Rating System

Impact assessment must take account of the nature, scale and duration of impacts on the environment whether such impacts are positive or negative. Each impact is also assessed according to the project phases:

- planning
- construction
- operation
- decommissioning

Where necessary, the proposal for mitigation or optimisation of an impact should be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance should also be included. The rating system is applied to the potential impacts on the receiving environment and includes an objective evaluation of the mitigation of the impact. In assessing the significance of each impact the following criteria is used:

Table 6.6: The rating system

NATURE		
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity.		
GEOGRAPHICAL EXTENT		
This is defined as the area over which the impact will be experienced.		
1	Site	The impact will only affect the site.
2	Local/district	Will affect the local area or district.
3	Province/region	Will affect the entire province or region.
4	International and National	Will affect the entire country.
PROBABILITY		
This describes the chance of occurrence of an impact.		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
DURATION		
This describes the duration of the impacts. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase (0 – 1 years), or the impact will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the

		entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered indefinite.
INTENSITY/ MAGNITUDE		
Describes the severity of an impact.		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/ component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired. Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
REVERSIBILITY		
This describes the degree to which an impact can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures.
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.

IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts. A cumulative impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		
1	Negligible cumulative impact	The impact would result in negligible to no cumulative effects.
2	Low cumulative impact	The impact would result in insignificant cumulative effects.
3	Medium cumulative impact	The impact would result in minor cumulative effects.
4	High cumulative impact	The impact would result in significant cumulative effects
SIGNIFICANCE		
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The calculation of the significance of an impact uses the following formula: (Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity. The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.		
Points	Impact significance rating	Description
6 to 28	Negative low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive low impact	The anticipated impact will have minor positive effects.
29 to 50	Negative medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
29 to 50	Positive medium impact	The anticipated impact will have moderate positive effects.

51 to 73	Negative high impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
51 to 73	Positive high impact	The anticipated impact will have significant positive effects.
74 to 96	Negative very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
74 to 96	Positive very high impact	The anticipated impact will have highly significant positive effects.

7 CUMULATIVE EFFECTS ASSESSMENT

This section aims to address the following requirements of the regulations:

Appendix 1. (3)(i) An BAR (...) must include-

(j) an assessment of each identified potentially significant impact and risk, including- (i) cumulative impacts.

7.1 INTRODUCTION

The EIA Regulations (as amended in 2017) determine that cumulative impacts, "*in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities*." Cumulative impacts can be incremental, interactive, sequential or synergistic. EIAs have traditionally failed to come to terms with such impacts, largely as a result of the following considerations:

- Cumulative effects may be local, regional or global in scale and dealing with such impacts requires coordinated institutional arrangements;
- Complexity - dependent on numerous fluctuating influencing factors which may be completely independent of the controllable actions of the proponent or communities; and
- Project level investigations are ill-equipped to deal with broader biophysical, social and economic considerations.

Despite these challenges, cumulative impacts have been afforded increased attention in this Basic Assessment Report and for each impact / field of study a separate section has been added which discusses any cumulative issues, and where applicable, draws attention to other issues that may contextualise or add value to the interpretation of the impact. This chapter analyses the proposed project's potential cumulative impacts in more detail by: (1) defining the geographic area considered for the cumulative effects analysis; (2) providing an overview of relevant past and present actions in the project vicinity that may affect cumulative impacts; (3) presenting the reasonably foreseeable actions in the geographic area of consideration; and (4) determining whether there are adverse cumulative effects associated with the resource areas analysed.

The term "Cumulative Effect" has for the purpose of this report been defined as: the summation of effects over time which can be attributed to the operation of the Project itself, and the overall effects on the ecosystem of the grid connection corridor that can be attributed to the project and other existing and planned future projects.

7.2 GEOGRAPHIC AREA OF EVALUATION

The geographic area of evaluation is the spatial boundary in which the cumulative effects analysis was undertaken. The spatial boundary evaluated in this cumulative effects analysis generally includes an area of a 30km radius surrounding the proposed development – refer to Figure 13 below.

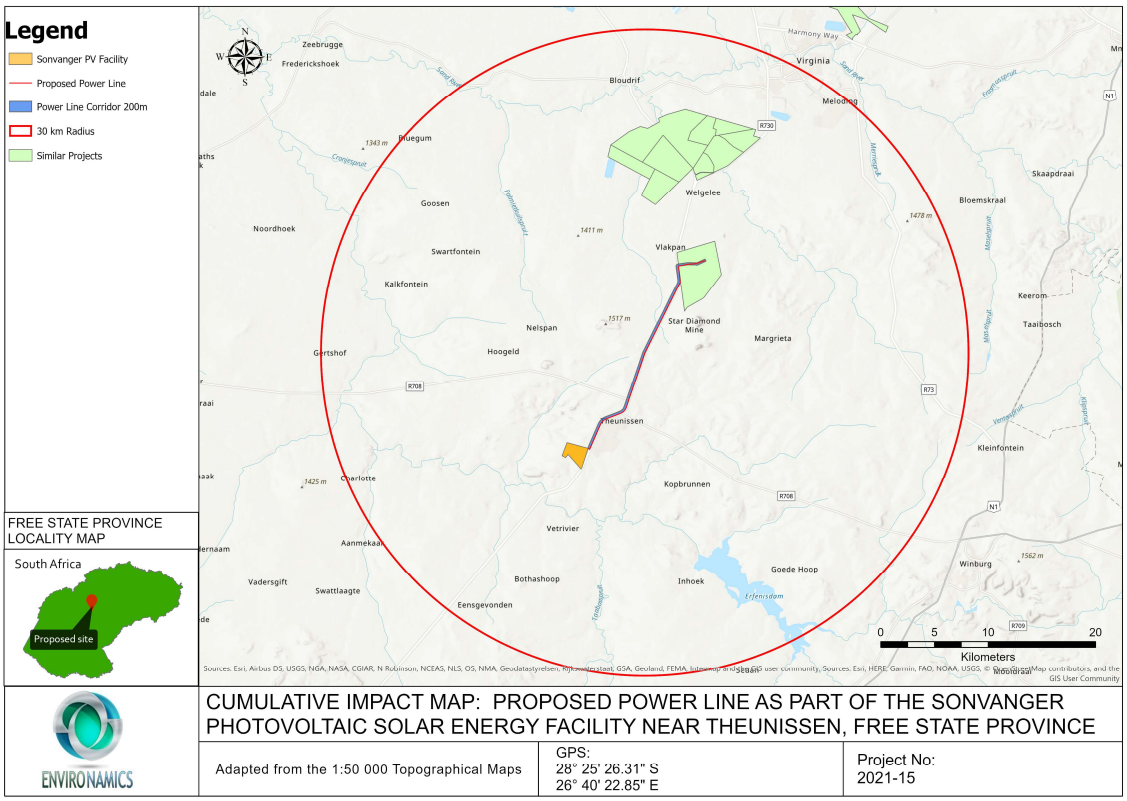

Figure 13: Geographic area of evaluation with utility-scale renewable energy generation sites (assuming the presence of required associated grid connection infrastructure)

The geographic spread of solar PV projects (including the associated grid connection infrastructure), administrative boundaries and any environmental features (the nature of the landscape) were considered when determining the geographic area of investigation. It was argued that a radius of 30km would generally confine the potential for cumulative effects within this particular environmental landscape. The geographic area includes projects located within the Free State Province. A larger geographic area may be used to analyse cumulative impacts based on the specific temporal or spatial impacts of a resource. For example, the socioeconomic cumulative analysis may include a larger area, as the construction workforce may draw from a much wider area. The geographic area of analysis is specified in the discussion of the cumulative impacts for that resource where it differs from the general area of evaluation described above.

7.3 TEMPORAL BOUNDARY OF EVALUATION

A temporal boundary is the timeframe during which the cumulative effects are reasonably expected to occur. The temporal parameters for this cumulative effects analysis are the anticipated lifespan of the proposed project, beginning in 2022 and extending out at least 20 years, which is the minimum expected project life of the proposed project. Where appropriate, particular focus is on near-term cumulative impacts of overlapping construction schedules for proposed projects in the area of evaluation.

7.4 OTHER PROJECTS IN THE AREA

The following section provides details on existing projects being proposed in the geographical area of evaluation.

7.4.1 Existing projects in the area

The area within which the proposed power line corridor is proposed is characterised by existing Eskom transmission and distribution infrastructure and solar power facilities. It must be noted that not all details of existing and proposed grid connection infrastructure within the surrounding area is known. The focus of the cumulative impact assessment is on proposed and existing solar power plants and the associated required grid connection infrastructure needed for the operation of the facilities.

Table 7.1: A summary of related facilities, that may have a cumulative impact, in a 30 km radius of the study area

Project Name	MW	DEA REF	PROJECT STATUS
Construction Of the 19MW Photovoltaic Facility For The Generation Of Electricity On Portion Of Farm Palmietkuil 328, Beatrix Mine Shaft 4, Oryx Mine In Virginia, Free State Province.	19	12/12/20/2666	Approved
Proposed Construction Of A Photovoltaic Solar Panel Facility And Associated Infrastructure On Portion 52 Of Farm Leeubult, Beatrix Mine Shaft 2 In Virginia, Free-State Province	14	12/12/20/2667	Approved
Proposed development and implementation of solar panels (solar photovoltaic project 221) for electricity generation on portion of the farm Leeubult 52 Beatrix Mine Shaft 2, Virginia, Free State	19.9	12/12/20/2668	Approved
The Proposed Construction Of The Photovoltaic Solar Facility And Associated Infrastructure On Portion 225 Of Farm Kalkoenkrans, Beatrix Mine Shaft 4, Oryx Mine In Virginia, Free-State Province	19	12/12/20/2669	Approved
The Proposed Installation Of A Co-Generation Plant At Shaft 4 At The Beatrix Gold Mine, Theunissen, Free State Province	18.8	14/12/16/3/1/3	Approved
The Proposed Development Of Co-Generation Facility At The Beatrix Gold Mine Shaft 4, Located Between Theunissen And Virginia, Within Masilonyana Local Municipality, Free State Province	4	14/12/16/3/3/2/328	Approved
Proposed 75MW Oryx solar energy facility near Virginia Free State Province	75	14/12/16/3/3/2/526	In process
Proposed Sonvanger photovoltaic solar energy facility near Theunissen in Free State	84	14/12/16/3/3/2/672	Approved

It is unclear whether other projects not related to renewable energy is or has been or will be constructed in this area. In general, development activity in the area is focused on mining and agriculture. Agriculture in the area is primarily associated with cattle grazing and cultivation. The next section of this report will aim to evaluate the potential for solar projects (including the associated grid connection infrastructure) for this area in the foreseeable future.

7.4.2 Projects in the foreseeable future

As part of the SEA for Wind and Solar Energy in South Africa, the CSIR and the DEFF mapped the location of all EIA applications submitted within South Africa. According to this database

approximately 07 applications have been approved, with one application still being in process. The majority of these projects are located to the north, near the Beatrix Mine (Sibanye Stillwater).

7.5 SPECIALIST INFORMATION ON CUMULATIVE EFFECTS

In line with the Terms of Reference (ToR) provided, specialists were asked to, where possible, take into consideration the cumulative effects associated with the proposed development and other projects which are either developed or in the process of being developed in the local area. The following sections present their findings.

7.5.1 Ecology and Wetlands

The Terrestrial Biodiversity, Plant and Animal Species Impact Assessment and the Wetland Impact Assessment (refer to Appendix D1 and Appendix D2) confirmed that the impacts associated with the proposed power line will include direct habitat destruction, habitat fragmentation, increased soil erosion and sedimentation, soil and water pollution, air pollution, spread and establishment of alien invasive species, negative effect of human activities and road mortalities, impact on the characteristics of the watercourse, soil compaction and increased risk of sediment transport and erosion, soil and water pollution and the spread and establishment of alien invasive species. With the implementation of the proposed mitigation measures the extent of the impacts is expected to be reduced and concentrated within the site/grid connection corridor, and will therefore be linked only to the actual on-ground development footprint of the proposed infrastructure. Considering the location of the project adjacent / parallel to an existing road (R30), and the extent of the associated impacts being concentrated to the site with the implementation of mitigation measures, no unacceptable cumulative impacts are identified. Downstream impacts may however be related to soil and water pollution where pollutants are spilled into the water features.

7.5.2 Avifaunal

It is the cumulative impacts, when considering the existing transformation of the threatened habitats to croplands and mining, in addition to the prevalence of planned solar developments, that increase the cumulative risks and, therefore, warrant mitigations. Mitigating the cumulative impacts would require limiting the impact of Sonvanger SPP's power lines to an absolute minimum, which is not necessarily feasible but should be pursued. The mitigations to reduce cumulative impacts involve limiting the disturbance footprint (overall size), focussing the development on already disturbed zones, limiting human activity and noise throughout the project life, disturbing as little natural vegetation as possible, retaining the natural vegetation beneath the panels and around infrastructure, limiting the extent and width of roadways, reducing the speeds that vehicles travel, and then thoroughly rehabilitating the entire footprint back to natural grassland representing the Vaal-Vet Sandy Grassland after decommissioning. Implementing successful mitigations along the power line should reduce the impact rating for cumulative displacement resident avifauna by 19% down to an acceptable Low-Negative score, however cumulative displacement of priority avian species would reduce by 28% but would still be in the Medium-Negative category

7.5.3 Visual

The Visual Impact Assessment (refer to Appendix D4) confirms that cumulative impacts are expected to occur during the construction and operation phases of the project. During the construction phase the construction activities may increase the cumulative visual impact together with existing electricity

infrastructure, specifically for road users using the R48. Dust is considered to be the main factor which must be considered for this phase. The significance of the impacts will be low.

During the operation phase visual impacts are expected to occur for observers in close proximity to the development, for visual receptors within the region and visual and sense of place impacts. The significance of these impacts will be low.

7.5.4 Heritage

Based on the known archaeological sensitivity of the broader area, as well as the previously disturbed nature of the grid connection corridor along the R30 and the limited footprint anticipated for the proposed power line, it is not anticipated that the proposed development will negatively impact on any significant archaeological resources. While it is possible that burials may be located within the grid connection corridor, impact to these sites can be avoided through strategic placement of the pylons.

According to a Desktop Palaeontological Assessment completed by Bamford (2021) for this project, "The proposed site route in the northern section lies on the Quaternary sands, alluvium and calcretes that are non-fossiliferous unless there are traps for fossils such as paleo-pans or palaeo-springs. No such feature is visible on the satellite imagery. The southern half is on non-fossiliferous dolerite of Jurassic age. Based on this information it is recommended that no palaeontological site visit is required unless fossils are found when excavations for foundations commence." No further studies are required. The implementation of a Fossil Find procedure must be undertaken as part of the EMPr.

Considering the low sensitivity of the area from a heritage perspective, the cumulative impacts will be low.

7.6 IMPACT ASSESSMENT

Following the definitions of the term, the "residual effects on the environment", i.e. effects after mitigation measures have been put in place, combined with the environmental effects of past, present and future projects and activities will be considered in this assessment. Also, a "combination of different individual environmental effects of the project acting on the same environmental component" can result in cumulative effects.

7.6.1 Potential Cumulative Effects

The receptors (hereafter referred to as Valued Ecosystem Components (VECs) presented in Section 6 (refer to the matrix analysis) have been examined alongside other past, present and future projects for potential adverse cumulative effects. A summary of the cumulative effects discussed are summarized in Table 7.2. There have been 22 specific VECs identified with reference to the Solar Project (Table 6.2), which relates to the biophysical and socio-economic environments. Table 7.2 indicates the potential cumulative effects VECs and the rationale for inclusion/exclusion.

Table 7.2: Potential Cumulative Effects for the proposed project

Valued Ecosystem Components (VECs)	Rationale for Inclusion / Exclusion	Level of Cumulative Effect
Construction Phase		
Loss or fragmentation of indigenous natural fauna and flora	The loss of habitat on-site has the potential to add to the cumulative impacts that habitat loss in the region is having on avifauna.	- Low
Avifauna	Development of multiple solar energy facilities, and the associated grid connection infrastructure, in this region may have cumulative impacts on birds, this will happen via the same factors identified here viz: collision, avoidance and displacement.	- Medium
Loss or fragmentation of habitats	Removal of large areas of habitats may have a significant effect on loss of habitats.	- Medium
Soil erosion	The largest risk factor for soil erosion will be during the construction phase. Should these impacts occur, there may be a cumulative impact on storm water runoff in the corridor.	- Medium
Impacts of the geology on the proposed development	A fatal flaw cannot be identified that may prematurely terminate the development of the proposed solar farm.	N/A
Generation of waste	An additional demand for landfill space could result in cumulative impacts if services become unstable or unavailable, which in turn would negatively impact on the local community.	- Low
Employment opportunities	The community will have an opportunity to better their social and economic well-being, since they will have the opportunity to upgrade and improve skills levels in the area.	+ Low
Visual intrusion	The construction of the PV plant and 132kV evacuation line may increase the cumulative visual impact together with farming and mining activities and people using the regional road adjacent to site.	- Low

	Dust will be the main factor to take into account.	
Increase in construction vehicles	If damage to roads is not repaired, then this will affect the farming and mining activities in the area and result in higher maintenance costs for vehicles of locals and other road users. The costs will be borne by road users who were no responsible for the damage.	- Negligible
Impact of construction workers on local communities & influx of job seekers	Impacts on family and community relations that may, in some cases, persist for a long period of time. Also in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent cumulative impacts on the affected individuals and/or their families and the community.	- Low
Risk to safety, livestock and farm infrastructure	If fire spreads to neighbouring properties, the effects will be compounded. Negligible cumulative effects, provided losses are compensated for.	- Low
Increased risks of grass fires	The risk of grass fires can be mitigated and managed.	- Negligible
Operational Phase		
Loss of agricultural land	Because of the location of the corridor parallel to a regional road its contribution to any cumulative impact is considered to be low.	- Low
Change in land use	Overall loss of farmland could affect the livelihoods of the affected farmers, their families, and the workers on the farms and their families. The impacts is however mitigated with the placement of the grid connection corridor adjacent to the existing R30 regional road.	- Low
Visual intrusion	The operation of the 132kV evacuation line may increase the cumulative visual impact together with the existing Eskom power infrastructure, mining in the area and	- Low

	agricultural infrastructure.	
Consumption of water	An additional demand on water sources could result in a significant cumulative impact with regards to the availability of water. However, the power line will not use water during the operational phase.	- Negligible
Generation of additional electricity	The evacuation of generated electricity into the Eskom grid will strengthen and stabilize the grid (especially in the local area).	+ Low
Change in the sense of place	The construction of the power line will increase the cumulative change in the sense of place due to industrial type infrastructure that is being proposed and the existing mining infrastructure in the region. Since the area is already largely transformed, the impact will be limited.	- Low
Development of infrastructure for the generation of clean, renewable energy	Reduce carbon emissions via the use of renewable energy and associated benefits in terms of global warming and climate change.	+ Medium
Decommissioning Phase		
Visual intrusion	The decommissioning of the PV plant and 132kV evacuation line may increase the cumulative visual impact together with farming and people using the existing roads adjacent to site. Dust and housekeeping will be the main factors to take into account.	- Low
Generation of waste	An additional demand on municipal services could result in significant cumulative impacts with regards to the availability of landfill space.	- Medium

7.7 CONCLUSION

This chapter of the Basic Assessment Report (BAR) addressed the cumulative environmental effects of the construction, operation and decommissioning project phases. The information to date has shown that no significant adverse residual impacts are likely. However, cumulative impacts could arise as other similar projects are constructed in the area.

The potential most significant cumulative impacts relate to:

- Cumulative effects during construction phase:

- Loss or fragmentation of indigenous natural fauna and flora (- Low)
- Avifauna (- Medium)
- Loss or fragmentation of habitats (- Medium)
- Soil erosion (- Medium)
- Generation of waste (- Low)
- Temporary employment (+ Low)
- Visual intrusion (- Low)
- Increase in construction vehicles (-Negligible)
- Impact of construction workers on local communities & influx of job seekers (- Low)
- Risk to safety, livestock and farm infrastructure (-Low)
- Increased risk of grass fires (-Negligible)

- Cumulative effects during the operational phase:

- Loss of agricultural land (-Low)
- Change in land use (- Low)
- Visual intrusion (- Low)
- Consumption of water (-Negligible)
- Generation of additional electricity (+ Low)
- Change in the sense of place (- Low)
- Development of infrastructure for the generation of clean, renewable energy (+ Medium)

- Cumulative effects during the decommissioning phase:

- Visual intrusion (- Low)
- Generation of waste (- Medium)

8 ENVIRONMENTAL IMPACT STATEMENT

This section aims to address the following requirements of the regulations:

Appendix 3. (3) An BAR (...) must include-

(l) an environmental impact statement which contains-

(i) a summary of the key findings of the environmental impact assessment:

(ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and

(iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;

(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr;

(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;

(o) a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;

(q) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;

8.1 SUMMARY OF KEY FINDINGS AND ASSESSMENT RESULTS

Based on the contents of the report the following key environmental issues were identified, which were addressed in this EIA report (rating provided is the significance of the impact include mitigation):

- Impacts during construction phase:
  - Direct habitat destruction (-Medium)
  - Habitat fragmentation (-Medium)
  - Increased soil erosion and sedimentation (-Medium)
  - Soil and water pollution (-Low)
  - Air pollution (-Low)
  - Spread and establishment of alien invasive species (-Negligible)
  - Negative effect of human activities and road mortalities (-Negligible)
  - Impact on the characteristics of the watercourse due to construction within the flood line zone. (-Low)

- Soil compaction and increased risk of sediment transport and erosion (- Low)
- Soil and water pollution (- Low)
- Spread and establishment of alien invasive species (- Low)
- Displacement of priority avian species from important habitats (- Low)
- Impacts on heritage objects (- Low)
- Generation of waste - general waste, construction waste, sewage and grey water (- Low)
- Creation of local employment and business opportunities, skills development and training (+Medium)
- Technical support to local farmers and municipalities (+Low)
- Potential loss of productive farmland (- Low)
- In-migration or influx of job seekers (- Low)
- Presence of construction workers on the local communities (- Low)
- Heavy vehicles and construction activities (- Low)
- Risk to safety, livestock and farm infrastructure (- Low)
- Increased risk of veld fires (- Low)
- Visual impact of construction activities on sensitive visual receptors in close proximity to the proposed power line (-Low)

➢ Impacts during the operational phase:

- Collision of avifauna when flying into power line infrastructure (-Medium)
- Electrocution of avifauna when perched on power line infrastructure (-Medium)
- Soil erosion (- Low)
- Local employment and business opportunities, skills development and training (+Medium)
- Potential loss of productive farmland (- Low)
- Change in the sense of place (- Low)
- Development of infrastructure for the generation of clean, renewable energy (+Medium)
- Potential visual impacts on sensitive visual receptors located within a 5km radius (-Medium)
- Potential visual impacts on sensitive visual receptors in the region (5-10km) (- Low)
- Visual and sense of place impacts (- Low)

➢ Impacts during the decommissioning phase:

- Direct habitat destruction (-Medium)
- Habitat fragmentation (-Medium)
- Increased soil erosion and sedimentation (-Medium)
- Soil and water pollution (-Low)
- Air pollution (-Low)
- Spread and establishment of alien invasive species (-Negligible)
- Negative effect of human activities and road mortalities (-Negligible)

- Generation of waste (-Low)
- Soil erosion (-Low)

➢ Cumulative biophysical impacts resulting from similar development in close proximity to the proposed activity (- Medium)

8.2 RECOMMENDATION OF EAP

The final recommendation by the EAP considered firstly if the legal requirements for the EIA process had been met and secondly the validity and reliability of the substance of the information contained in the BA report. In terms of the legal requirements it is concluded that:

- All key consultees have been consulted as required by Chapter 6 of the EIA Regulations - already approved by the environmental authority.
- The Basic Assessment process has been conducted as required by the EIA Regulations, Regulations 19 and Appendix 1.
- The EMPr was compiled in conjunction with the Generic EMPr for overhead electricity transmission and distribution infrastructure and substation infrastructure which was published in Government Gazette 42323 on 22 March 2019.
- The proposed mitigation measures will be sufficient to mitigate the identified impacts to an acceptable level.

In terms of the contents and substance of the BA report the EAP is confident that:

- All key environmental issues were identified during the BA process. These key issues were adequately assessed during the BA phase to provide the environmental authority with sufficient information.

The final recommendation of the EAP is that:

It is the opinion of the independent EAP that the proposed development will have a net positive impact for the area and will subsequently ensure the optimal utilisation of resources through enabling the operation of the authorised Sonvanger Solar Power Plant. All negative environmental impacts can further be effectively mitigated through the proposed mitigation measures, and the significance of the impacts can be reduced to either medium or low. Based on the contents of the report it is proposed that an environmental authorisation be issued, which states (amongst other general conditions) that the power line and substation as part of the Sonvanger Solar Power Plant and associated infrastructure, Registration Division Theunissen, Free State Province be approved subject to the following conditions:

- Implementation of the proposed mitigation measures set out in the EMPr.
- Implementation of the proposed mitigation measures set out in the specialist studies.
- The proposed power line must comply with all relevant national environmental laws

and regulations.

- All actions and task allocated in the EMPr should not be neglected and a copy of the EMPr should be made available onsite at all times.
- Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

We trust that the department find the report in order and eagerly await your final decision in this regard.

Lisa Opperman

Environamics - Environmental Consultants

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