DRAFT

DRAFT ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT SCOPING REPORT FOR THE PROPOSED DEVELOPMENT OF RENEWSTABLE®QHAKAZA ON THE FARM SCHURVEPOORT 63-HS PORTION 10 IN AMERSFOORT WITHIN THE JURISDICTION OF DR PIXELY KA ISAKA SEME LOCAL MUNICIPALITY, MPUMALANGA PROVINCE

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13 SEPTEMBER 2024

PREPARED FOR:

RENEWSTABLE MPUMALANGA

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"From the world we live to the world we seek"

PROJECT TITLE:

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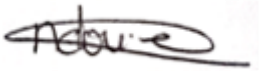
DRAFT ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT SCOPING REPORT	Karabo Mashabela  _____ EAP EAPASA: 2019/ 4157 02 September 2024	Esther Ndou  _____ Candidate EAP EAPASA: 2020/2319 09 September 2024

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13 September 2024

EXECUTIVE SUMMARY

As part of the Eskom land tender MWP1247GX, Hydrogene de France (HDF- Energy) has been awarded 1782 ha of Eskom's land to develop 8 Renewstable® hydrogen power plants in the Mpumalanga Province, South Africa. Distributed over five farm portions near the Tutuka and Majuba Coal Power Stations, HDF-Energy is part of a cluster of different project developers, also awarded with land in the area to develop infrastructure related to renewable energy. HDF-Energy, under its Special Purpose Company (SPC) "Renewstable Mpumalanga (Pty) Ltd", is undertaking the development and implementation of 4 projects referred to as Majuba Cluster that consists of the following:

- Renewstable®Ntokozo
- Renewstable® Bokamoso
- Renewstable® Sivutse
- **Renewstable® Qhakaza**

These projects are high-capacity renewable power plants based on hydrogen energy storage technology. They will provide the country with the respective electricity services. This ESIA is specifically for the proposed Renewstable®Qhakaza, within an agricultural area on the Farm Schurvepoort 63-HS Portion 10, located approximately 18 km northeast of Majuba Power Station and approximately 8 km southeast of Amersfoort, within Ward 7 of the Dr Pixley Ka Isaka Seme Local Municipality in the Mpumalanga Province. The extent of the site is approximately 120 ha. The proposed site is located approximately 10km south-west of Amersfoort and 10km north-east of Daggakraal in ward 7 of Dr Pixley Ka Isaka Seme Local Municipality (DPKISLM), in turn, forms part of the Gert Sibande District Municipality (GSDM) of the Mpumalanga Province.

Spatially, the GSDM covers an area of 31 841 km^2 and has seven local municipalities. The DPKISLM covers a geographical area of 5,236 km^2. The administrative seat of the DPKISLM is located in Volksrust. The local community relevant to the economic impact assessment is defined as those within a 5km radius of the site, meaning they are the project's immediate influence sphere. In comparison, the communities that fall within the 10 km radius of the wider influence sphere will also be considered if applicable.

The proposed development aims to respond to the government initiative driven by the need to diversify the country's energy sources and create a balanced, more sustainable energy mix. The proposed project will contribute significantly to South Africa's transition to clean and sustainable energy, reduce greenhouse gas emissions, create job opportunities, and enhance energy security. The project is a compelling endeavour that addresses immediate energy needs and sets the stage for a greener and more prosperous future in South Africa. The proposed project will ensure energy diversification, enhance diversification, enhance grid services, and provide economic stimulus for the region and country.

The proposed Renewstable® Bokamoso triggers listed activities in terms GNR 983, GNR 984, and GNR 985 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), EIA Regulations of 2014 as amended, which requires an Environmental Impact Assessment (EIA) process to be undertaken by a registered Environmental Assessment Practitioner (EAP); a Water Use Licence Application (WULA) triggering Section 21: a, b, c, e, g, and i, in terms of the National Water Act, 1998 (Act No. 36 of 1998) (NWA) from the Department of Water and Sanitation (DWS).

Subsequently, Nsovo Environmental Consulting (Nsovo) is the independent consultant appointed by HDF-Energy (Pty) Ltd and is responsible for the necessary authorisation and licensing processes to comply with the legislative requirements. The project Applicant is Renewstable Mpumalanga (Pty) Ltd., whereas the Competent Authority is the Department of Forestry, Fisheries, and the Environment (DFFE). The project will be undertaken in line with the requirements of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) and associated EIA Regulations of 2014 as amended.

The objectives of the Scoping process, as indicated in the Regulations process, is to, through a consultative process—

i. identify the relevant policies and legislation relevant to the activity;
ii. motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
iii. identify and confirm the preferred activity and technology alternative through an identification of impacts and risks and ranking process of such impacts and risks;
iv. identify and confirm the preferred site through a detailed site selection process, which includes an identification of impacts and risks inclusive of identification of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment
v. identify the key issues to be addressed in the assessment phase;
vi. agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be conducted to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration, and probability of the impacts to inform the location of the development footprint within the preferred site; and
vii. Identify suitable measures to avoid, manage, or mitigate identified impacts and determine the extent of the residual risks that need to be managed and monitored.

The Scoping phase entails a detailed description of the baseline environment, forming the backdrop of the impact assessment phase. Further, it allows for identifying critical issues and concerns based on input from the relevant stakeholders, I&APs, and the EAP's professional judgment based on experience and expertise.

Alternatives

Various aspects are considered in identifying the alternatives, including the degree of sensitivity of the site, technical viability, and, to a certain extent, economic viability. The scoping assessment, including specialist input, highlighted the following: The proposed Renewstable®Qhakaza will be undertaken on land parcels earmarked for similar projects and deemed preferable and most feasible for projects of this nature. As such, alternatives considered will only include technical and no-go alternatives.

Specialist Input

To assess the potential impacts on the environment associated with the construction and operation of the proposed Renewstable®Qhakaza and associated infrastructure, detailed specialist studies must be undertaken to assess the environmental impacts. The identification and assessment of impacts were based on input from specialist studies that provided baseline information and the necessary details in preparation for the report. The details of the Specialist are included in the Table below, and the Reports are attached as Appendix C:

Specialist Study	Company	Specialist	Screening Tool	SSV OUTCOME
Draft Reports /SSV Reports completed and attached.				
Wetland and Aquatic Assessment	WaterMakers	Willem Lubbe		
Heritage Impact Assessment	AHSA	Edward Matenga		
Agricultural Impact Assessment	Nsovo Environmental Consulting	Tshiamo Setsipane		
Terrestrial Biodiversity Assessment	Amanzi Environmental Services	Rudi Greffrath		
Plant theme				
Animal				
Paleontological Assessment	Bamford (Pty) Ltd	Dr. Marion Bamford		
Civil Aviation Verification	GWI Group	Jon Heeger		
Glint and Glare				
RFI				

Specialist Study	Company	Specialist	Screening Tool	SSV OUTCOME
Visual Impact Assessment	Outline Landscape Architects	Katherine Hammel-Louw		
Defence	Nsovo Environmental			
Avifauna Impact Assessment	Cossypha Ecological	Robyn Phillips		
Herpetofauna	Mboneni Ecological Services	Avhafarei Phamphe		
Traffic Impact Assessment	Traffic Surveys	Pieter Joost		
Social Impact Assessment and Tourism	The Mana Holdings	Vhahangwele Manavhela		
Included in the Plan of Study to be completed during the EIA Phase				
Noise and Vibration Specialist	DB Acoustics	Barend		
Major Hazard Installation	ISHECON	-		
Air Quality and Climate Change Impact	EHRCON	Uno Neveling		

Screening

According to the National Web-based Environmental Screening Tool (2020),

- The project site is located within the Mpumalanga Air Quality Priority Area
- The site is not within the South African Protected Areas
- The site encroaches on Critical Biodiversity Area 2, particularly the southern and western portions, while the majority is heavily modified.
- The site is within an important bird area
- Channelled valley bottom wetlands were identified within the site. As such, the requisite buffers have been considered.

Public Participation

Social risks are a product of social development, and modern civilisation can further be defined as the potential for any loss, conflict, or instability due to specific issues in projects (e.g., investments, policies, or decisions) and the reaction of related stakeholders that are confronted with negative influences due to proposed projects. Social Risks cannot be eliminated; they can be effectively managed to mitigate the negative impacts. The Public Participation Process (PPP) is any process that involves the public in problem-solving and decision-making; it forms an integral part of the Scoping and ESIA process. The PPP provides I&APs with an opportunity to provide comments and raise concerns or make suggestions that may enhance the project's benefits. The main principle of Public Participation holds that those affected by a decision have the right to be involved in the decision-making process (i.e., the public's contribution will influence the decision).

The principles of public participation are to ensure that the PPP:

- Communicates the interests of and meets the process needs of all participants;
- Seek to facilitate the involvement of those potentially affected;
- Involves participants in defining how they participate; and
- Is as inclusive and transparent as possible; it must be conducted in line with the requirements of Regulations as amended.

The Scoping Report has been prepared as dictated by the Regulations and thus achieved the primary objectives as detailed above. The Draft Scoping Report will be available to the Interested and Affected Parties (I&APs) and the Organs of State for thirty (30) days for review and comment. All comments received will be included in the Comments and Response Report, which will form part of the final Scoping Report. The Plan of Study for the EIA is also incorporated in this report, and it is submitted to the Competent Authority (CA) (the National Department of Forestry, Fisheries, and Environment, (DFFE)) in terms of section 24C of the National Environmental Management Act (NEMA).

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LIST OF ACRONYMS AND ABBREVIATIONS

AEL	Atmospheric Emission License
BES	Battery Energy System
CARA	Conservation of Agricultural Resources Act, 1983 (43 of 1983)
CBA	Critical Biodiversity Area
CBD	Central Business District
DEFEAT	Department of Economic Development, Environmental Affairs and Tourism
DFFE	Department of Forestry, Fisheries, and the Environment
DSWS	Department of Water and Sanitation
DMRE	Department of Mineral Resources and Energy
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMPr	Environmental Management Programme
ERA	Electricity Regulation Act, 2006 (4 of 2006)
GNR	Government Notice Regulations
HyPCe	Hydrogen Power Center
HSA	Hazardous Substances Act, 1973 (56 of 1973)
I&APs	Interested and Affected Parties
ICE	Internal Combustion Engine
IDP	Integrated Development Plan
IEA	International Energy Agency
IEP	Integrated Energy Plan
IEM	Integrated Environmental Management
IFC	International Finance Corporation

IOGP	International Association for Oil & Gas Producers
IPCC	Intergovernmental Panel on Climate Change
IPPPP	Independent Power Producers Procurement Programme
IRP	Integrated Resource Plan
LM	Local Municipality
LNG	Liquefied Natural Gas
MPT	Mpumalanga Parks and Tourism
MBSP	Mpumalanga Biodiversity Sector Plan
MPRDA	Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MDARDLA	Mpumalanga Department of Agriculture, Rural Development and Land Administration
MW	Megawatt
NCRECA	Noise Control Regulations under the Environmental Conservation Act, 1989 (73 of 1989)
NDP	National Development Plan
NEMA	National Environmental Management Act, 1998 (Act 107 of 1998)
NEMAQA	National Environmental Management: Air Quality Act, 2004 (No. 39 of 2004)
NEMBA	National Environmental Management: Biodiversity Act, 2004 (No. 10 of 2004)
NEMPA	National Environmental Management: Protected Areas Act, 2003 (57 of 2003)
NEMWA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NHRA	National Heritage Resources Act, 1999 (No. 25 of 1999)
NO_2	Nitrogen dioxide
NPA	National Ports Act, 2005 (12 of 2005)
NPAES	National Protected Areas Expansion Strategy (2009)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
OCGT	Open Cycle Gas-Turbine
OHSA	Occupational Health and Safety Act, 1993 (Act 85 of 1993)
PPP	Public Participation Process

SACAD	South Africa Conservation Areas Database
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SAPAD	South Africa Protected Areas Database
ToR	Terms of Reference
WULA	Water Use Licence Application
OEM	Original Equipment Manufacturer
O&M	Operation and Maintenance
OHSA	Occupational Health and Safety Act 85 of 1993

Term	Definition
Cumulative Impacts	Cumulative impacts are those that result from the successive, incremental, and/or combined effects of an action, project, or activity (collectively referred to as "developments") when added to other existing, planned, and/or reasonably anticipated future ones
Direct Job	A direct job is created to fulfil the demand for a product or service.
Environment	The aggregate of surroundings within which people exist. The environment is made up of the soil, water, and atmosphere; fauna and flora; any part, combination, or interrelationships among these; and all the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.
Indirect job	An indirect job is one that produces the goods and services needed by workers with direct jobs.
Induced Jobs	Employment created by the additional personal spending (e.g., eating at a restaurant) by direct and indirect workers is classified as an induced job.
Protected Areas	The International Union for Conservation of Nature defines a protected area as a clearly defined geographical space recognised, dedicated, and managed through legal or other effective means to achieve the long-term conservation of nature.
Remote Navigation	Satellite-based navigation systems similar to GNSS.
Runway	According to the International Civil Aviation Organization, a runway is a "defined rectangular area on a land airport prepared for the landing and take-off of aircraft."

Species Of Conservation Concern (SCC)	Species of conservation concern (SCC) are those with a Red List status higher than Least Concern at a national level (Taylor et al., 2015) and a global level (IUCN, 2023) and/or species Protected at a national level (DFFE, 2023).
Stakeholders	All individuals, groups, organizations, and institutions interested in and potentially affected by a project or having the ability to influence a project.
Wetland	According to the National Water Act (Act no 36 of 1998), a wetland is defined as "land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil."

1 INTRODUCTION AND BACKGROUND

As part of the Eskom land tender MWP1247GX, Hydrogene de France (HDF- Energy) has been awarded 1782 ha of Eskom's land to develop 8 Renewstable® hydrogen power plants in the Mpumalanga Province, South Africa. Distributed over five farm portions near the Tutuka and Majuba Coal Power Stations, HDF-Energy is part of a cluster of different project developers, also awarded with land in the area to develop infrastructure related to renewable energy. HDF-Energy, under its Special Purpose Company (SPC) "Renewstable Mpumalanga (Pty) Ltd", is undertaking the development and implementation of 4 projects referred to as Majuba Cluster that consists of the following:

- Renewstable® Ntokozo
- Renewstable® Bokamoso
- Renewstable®Sivutse
- **Renewstable® Qhakaza**

The project's main objective is to design, develop, build, manufacture, operate, and maintain a 34MW Renewstable® Qhakaza power plant and related infrastructure near Amersfoort in Mpumalanga to generate clean energy/electricity, increase access to electricity and contribute to the country's sustainable development initiatives.

1.1 BACKGROUND

The proposed development triggers the NEMA EIA listed activities; as such, Renewstable Mpumalanga (Pty) Ltd is required to undertake an Environmental and Social Impact Assessment (ESIA) process and obtain an Environmental Authorisation in line with the requirements of the EIA Regulations of 2014 as amended and promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). This is an Environmental Authorisation application for listed activities in Government Notice Regulations (GN R) GN 983, GN R984 and GNR 985.

Subsequently, HDF-Energy appointed Nsovo Environmental Consulting (hereafter referred to as Nsovo) to undertake the necessary authorisation process to comply with the legislation's requirements. As per Section 24C(2)(a) of NEMA, the application will be lodged at the Department of Forestry, Fisheries, and the Environment (DFFE) since the Minister is the competent authority for granting environmental authorisations for establishing renewable energy projects.

1.2 SCOPE OF WORK

The proposed Renewstable® Qhakaza triggers listed activities, as indicated above, and can thus not proceed without an Environmental Authorisation issued by the Competent Authority. The project will thus follow the full Environmental Assessment (EIA), a two-phase process comprising the Scoping and the EIA phases. The social aspect will form part of the process to align with the requirements of South African legislation and international standards. Henceforth, the

process will be referred to as the Environmental and Social Impact Assessment (ESIA). The objectives of this ESIA are to:

- Identify the project's probable positive and negative impacts on the physical and social environment before, during, and after construction.
- Provide technical information and recommendations to enable the selection and design of the best alternatives for the project.
- Identify mitigation actions and monitoring plans and describe institutional and capacity-building arrangements for implementing the ESMP.

The objectives of the Scoping process, as indicated in the Regulations process, is to, through a consultative process—

i. Identify the relevant policies and legislation relevant to the activity.
ii. motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
iii. identify and confirm the preferred activity and technology alternative through an identification of impacts and risks and ranking process of such impacts and risks;
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v. identify the key issues to be addressed in the assessment phase;
vi. agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be conducted to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration, and probability of the impacts to inform the location of the development footprint within the preferred site; and
vii. Identify suitable measures to avoid, manage, or mitigate identified impacts and determine the extent of the residual risks that need to be managed and monitored.

The ESIA has been prepared and aligns with the requirements of the legislation provided in Section 6. The document has been prepared in line with Appendix 2 of the EIA Regulations of 2014 as amended, and all required information is contained herein.

2 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

HDF-Energy appointed Nsovo Environmental Consulting as the independent Environmental Assessment Practitioner (EAP) for the proposed project and meets the general requirements stipulated in regulations 13(3) of the NEMA 2014 EIA Regulations as amended. Nsovo therefore:

- Is independent and objective;
- Has expertise in conducting EIAs;
- Considers all relevant factors relating to the application; and
- Provides full disclosure to the applicant and the relevant environmental authority.

Table 1 provides details of the EAP and relevant experience. A detailed CV and qualifications are attached in Appendix B.

Table 1 : Details of the Environmental Assessment Practitioner (EAP)

Name of Company	Nsovo Environmental Consulting
Person Responsible	Munyadziwa Rikhotso
Professional Registration	EAP (EAPASA): Reg 2019/1156
Physical Address	40 Lyncon Road, Carlswald, Midrand, 1684
Telephone Number	087 803 9294
Fax Number	086 602 8821
Email	munyadzi@nsovo.co.za / admin@nsovo.co.za
Qualifications & Experience	BSc Hons Environmental Science **20 years of experience**
Project Related Expertise	In terms of project-related expertise, the Environmental Assessment Practitioner has undertaken projects of varying scale and complexity, including: • Integrated Environmental Impact Assessment and WULA for Exxaro discard dump expansion (2021). • Integrated Environmental Impact Assessment and WULA for Bushveld Vanchem Expansion project (2021).

	• Integrated Environmental Impact Assessment and WULA for Grammatikos Vogelfontein project (2021). • EIA for the proposed Tubatse Strengthening Phase 1 – Senakangwedi B integration within the jurisdiction of Greater Tubatse Local Municipality in Limpopo Province 2018). • EIA for the proposed Maphutha-Witkop powerline in Limpopo Province (2018).

2.1 DETAILS OF THE APPLICANT

Table 2 presents details of the applicant.

Table 2: Details of the Applicant

Name of Company	Renewstable Mpumalanga (Pty)Ltd
Project	Renewstable®Qhakaza

2.2 DETAILS OF THE SPECIALIST

To adequately identify and assess potential environmental impacts associated with the proposed project, Nsovo has appointed specialist sub-consultants listed in Table 3: List of Specialists. The specialist reports are included in the draft Environmental Social Impact Assessment Scoping Report (dESIAR).

Table 3: List of Specialists

Specialist Study	Company	Specialist	Reference
Draft Reports /SSV Reports completed and attached.			
Wetland and Aquatic Assessment	WaterMakers	Willem Lubbe	Appendix C1
Heritage Impact Assessment	AHSA	Edward Matenga	Appendix C2
Agricultural Impact Assessment	Nsovo Environmental Consulting	Tshiamo Setsipane	Appendix C3
Biodiversity (Terrestrial, Animal, and Plant) Assessment	Amanzi Environmental Services	Rudi Greffrath	Appendix C4

Specialist Study	Company	Specialist	Reference
Paleontological Assessment	Bamford (Pty) Ltd	Dr. Marion Bamford	Appendix C5
Civil Aviation Verification	GWI Group	Jon Heeger	Appendix C6
Glint and Glare			
RFI			
Visual Impact Assessment	Outline Landscape Architects	Katherine Hammel-Louw	Appendix C7
Herpetofauna	Mboneni	Avhafarei Phamphe	Appendix C8
Traffic Impact Assessment	Traffic Surveys	Pieter Jooste	Appendix C9
Social Impact Assessment and Tourism	Mana (Pty) Ltd	Vhahangwele Manavhela	Appendix C10
Avifauna Impact Assessment	Cossypha Ecological	Robyn Phillips	Appendix C11
Included in the Plan of Study to be completed during the EIA Phase			
Noise and Vibration Specialist	DB Acoustics	Barend Van Der Merwe	
Major Hazard Installation	ISHECON	-	
Climate Change Impact	EHRCON	Jeandre Neveling	

3 DESCRIPTION OF THE LOCALITY AND THE PROPERTY ON WHICH THE ACTIVITY IS TO BE UNDERTAKEN AND THE LOCATION OF ACTIVITY ON THE PROPERTY

The IFC PS section 8 states that where the project involves specifically identified physical elements, aspects, and facilities that are likely to generate impacts, environmental and social risks and impacts will be identified in the context of the Project's Area of Influence (PAOI). This area of influence encompasses, as appropriate, the area likely to be affected by:

(i) the project and the client's activities and facilities that are directly owned, operated or managed (including by contractors) and are a project component.

(ii) impacts from unplanned but predictable developments caused by the project that may occur later or at a different location or

(iii) indirect project impacts on biodiversity or ecosystem services upon which Affected Communities' livelihoods depend.

Subsequently, this section provides detailed information on the proposed project's location. The main aim is to provide the environmental aspects of the proposed development area and the baseline description of the surroundings.

3.1 LOCALITY OF THE PROPOSED PROJECT

The proposed project will be located outside an urban area, near Amersfoort on the Farm Schurvepoort 63-HS Portion 10, approximately 18 km northeast of Majuba Power Station and 8 km southeast of Amersfoort, within Ward 7 of DPKISLM in the jurisdiction of the Gert Sibande District Municipality, Mpumalanga Province.

The extent of the site is approximately 117 ha. Figure 1 below is a locality map that depicts the proposed study area at a scale of 1:50 000. Refer to Appendix A for the A3 locality and sensitivity maps. Figure 1 below is the locality map that depicts the proposed Renewstable®Qhakaza land parcel at a scale of 1:50 000.

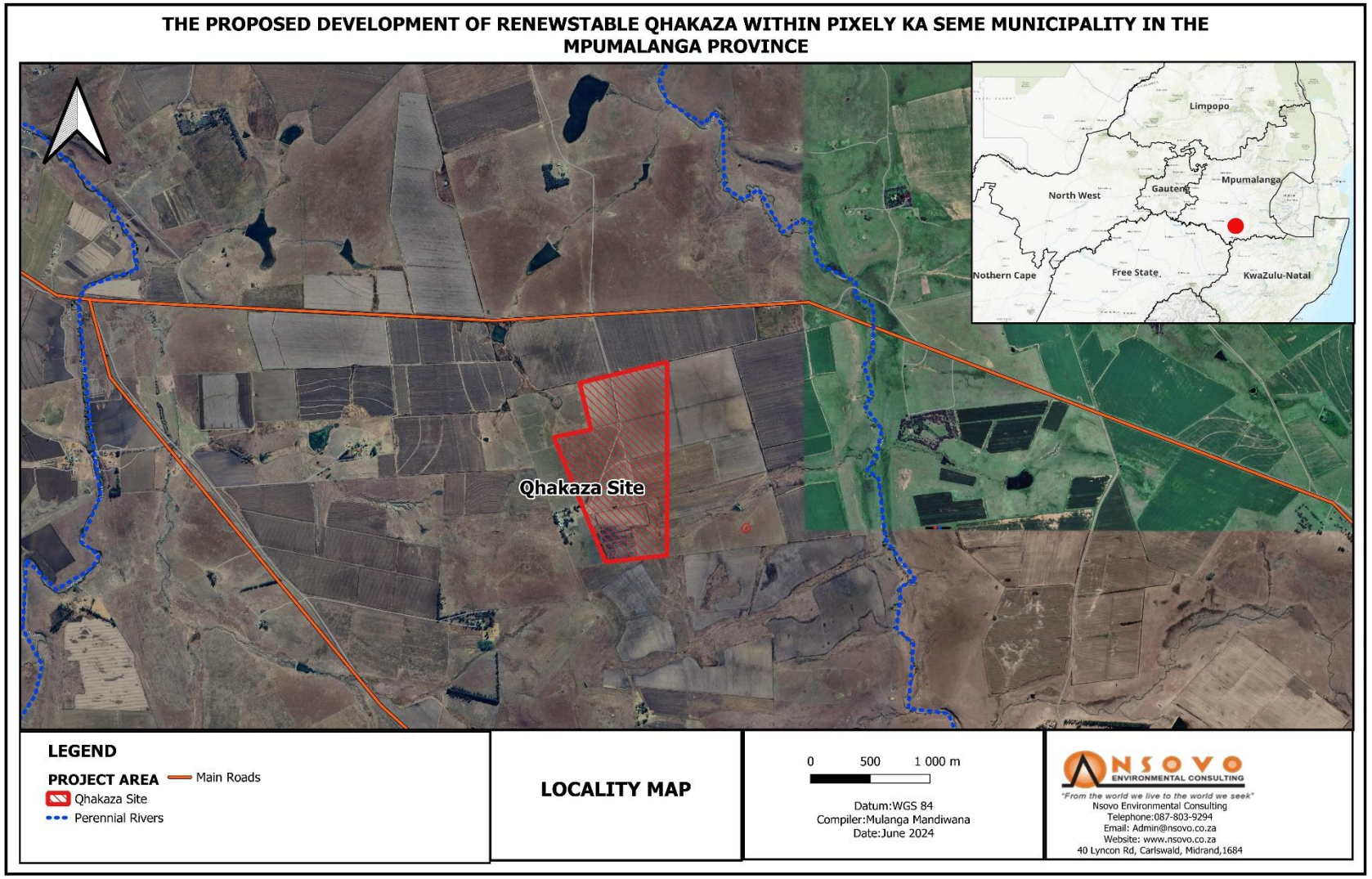


Figure 1: Locality map showing the proposed site for the Renewstable®Qhakaza

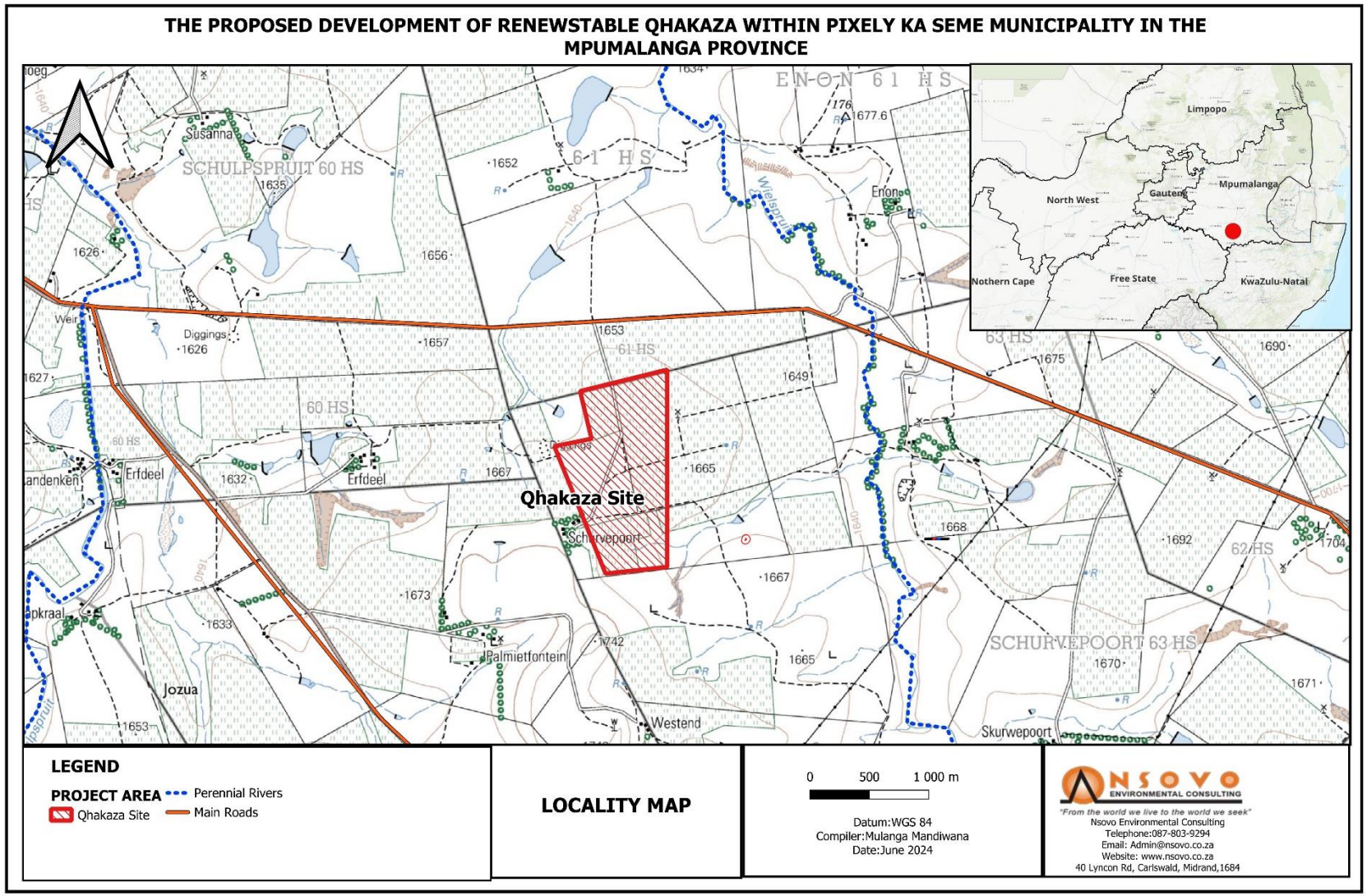


Figure 2. Topographical Locality Map

3.1.1 PROVINCE AND PROVINCIAL BOUNDARIES

The proposed development is located within the Mpumalanga Province, which lies in eastern South Africa and borders Eswatini and Mozambique. It shares borders with the South African provinces of Limpopo to the north, Gauteng to the west, the Free State to the southwest, and KwaZulu-Natal to the south. The provincial capital is Mbombela.

3.2 DESCRIPTION OF THE AFFECTED PROPERTIES

The proposed development of Renewstable® Qhakaza plant and associated infrastructures will be located on the Farms listed in Table 4.

Table 4: Property Details

Farm Name	Portion Number	Surveyor General 21 Digit Code
Proposed Site		
Farm Schurvepoort 63-HS	10	T0JU00000000006300010
Access Roads		
Farm Schurvepoort 63-HS	10	T0JU00000000006300010

3.3 COORDINATES OF THE PROPOSED SITE

Table 5 and Figure 1 indicate the approximate coordinates for the proposed project area.

Table 5: Coordinates for the proposed project area

Point	Coordinates Latitude	Coordinates Longitude
Proposed Site		
Corner A	27° 2'15.48"S	29°55'51.55"E
Corner B	27° 2'9.51"S	29°56'17.68"E
Corner C	27° 3'2.95"S	29°56'17.70"E
Corner D	27° 3'4.76"S	29°55'59.23"E
Center coordinate	27° 2'38.60"S	29°56'4.11"E
Corner E	27° 2'30.26"S	29°55'43.37"E
Corner F	27° 2'28.00"S	29°55'54.73"E
Access Roads		
Start	27° 1'28.85"S	29°52'34.63"E

Middle	27° 1'56.64"S	29°55'1.90"E
End	27° 2'13.04"S	29°56'0.16"E

3.4 Surrounding Land Uses

Being Part of the "Majuba Cluster," Renewstable® Qhakaza and Renewstable® Ntokozo are the most isolated projects in the cluster. The land parcel is located 8 km as the crow flies from the Bergvliet farm portion relating to the project Renewstable® Sivutse. This land parcel is 17km and 76,6km from the Majuba Coal Power Substation and Eskom Alpha substation, respectively. The land use within and around the proposed development is predominantly agricultural and industrial. These are discussed in detail in the sub-sections below:

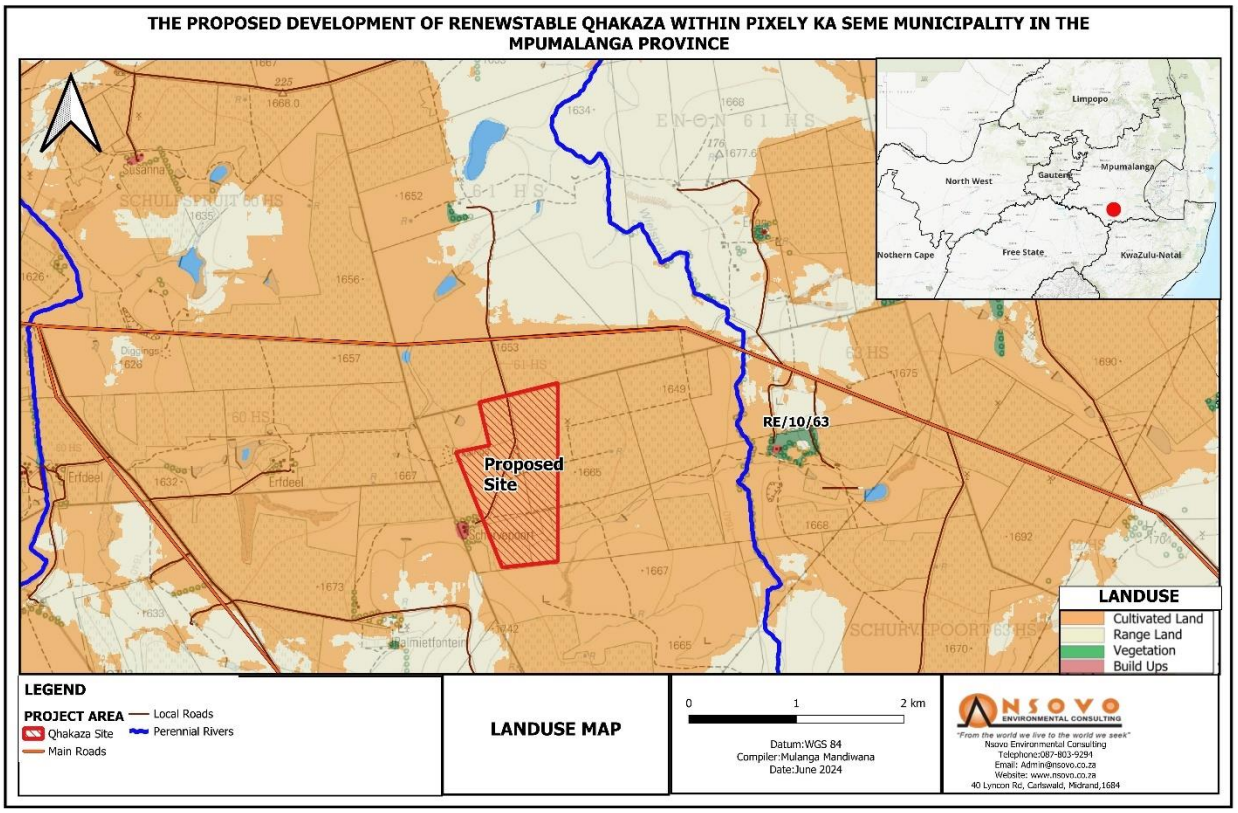


Figure 3: Land use Map of the study area (Nsovo,2024).

3.3.1 Agriculture And Farming

Amersfoort town is surrounded by vast open spaces predominantly used for rearing and maize farming. The proposed development is within Farm Schurvepoort 63-HS, currently used for crop farming and has maize as the cultivated crop.

3.3.2 Residential

The proposed development lies outside Amersfoort, and the site's immediate surroundings are mainly agricultural lands. The closest residential community is located on farm Schurvepoort, approximately 100m away. This relocated community was established when Majuba was developed and shares a property boundary with the Renewstable® Qhakaza project site. Other residential areas are more than 5km away, as detailed in Table 6 below.

Table 6: Residential Communities adjacent to the study area

Area	Type of community	Distance from the study area
Schurvepoort	This is a low-medium income residential household adjacent to the plant. The settlements were established following the relocation from Eskom.	Approximately 100 m
Amersfoort	Primarily, medium-income residential households characterise the town.	Approximately 8 km
Daggakraal	It is an impoverished and isolated community with plenty of unmined mineral resources. It is a low-income settlement whose primary activity is farming.	Approximately 10km

3.4.1 Commercial And Industrial

The main economic sectors within the DPKISLM include agriculture, community services, construction, mining, electricity, finance, manufacturing, transport, and trade.

3.4.2 Protected Areas

The site is approximately 12 km northwest of the African Farm Protected Area and 15 km northeast of the Majuba Nature Reserve. It is located within an area the avifauna specialist identifies as an Important Bird Area. The figures below confirm the closest nature reserves to the proposed site.

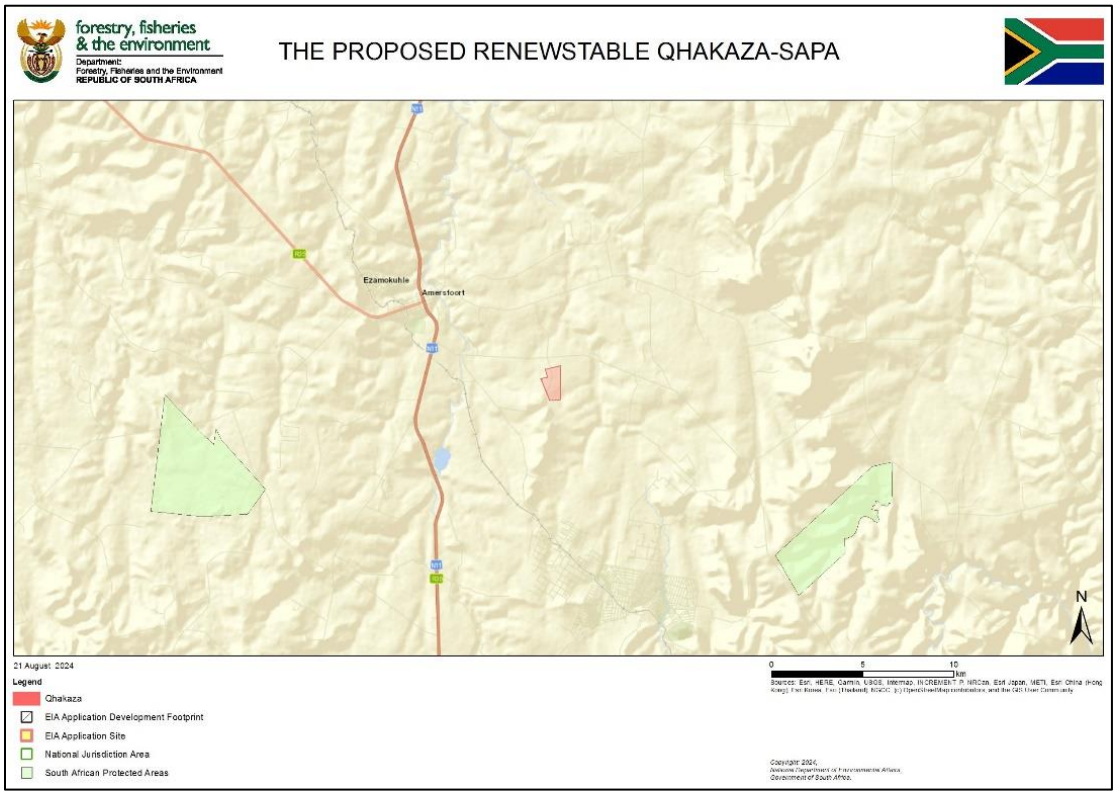


Figure 4: Confirmation of nature reserves within 10km of the study area (DFFE Screening Tool,2024)

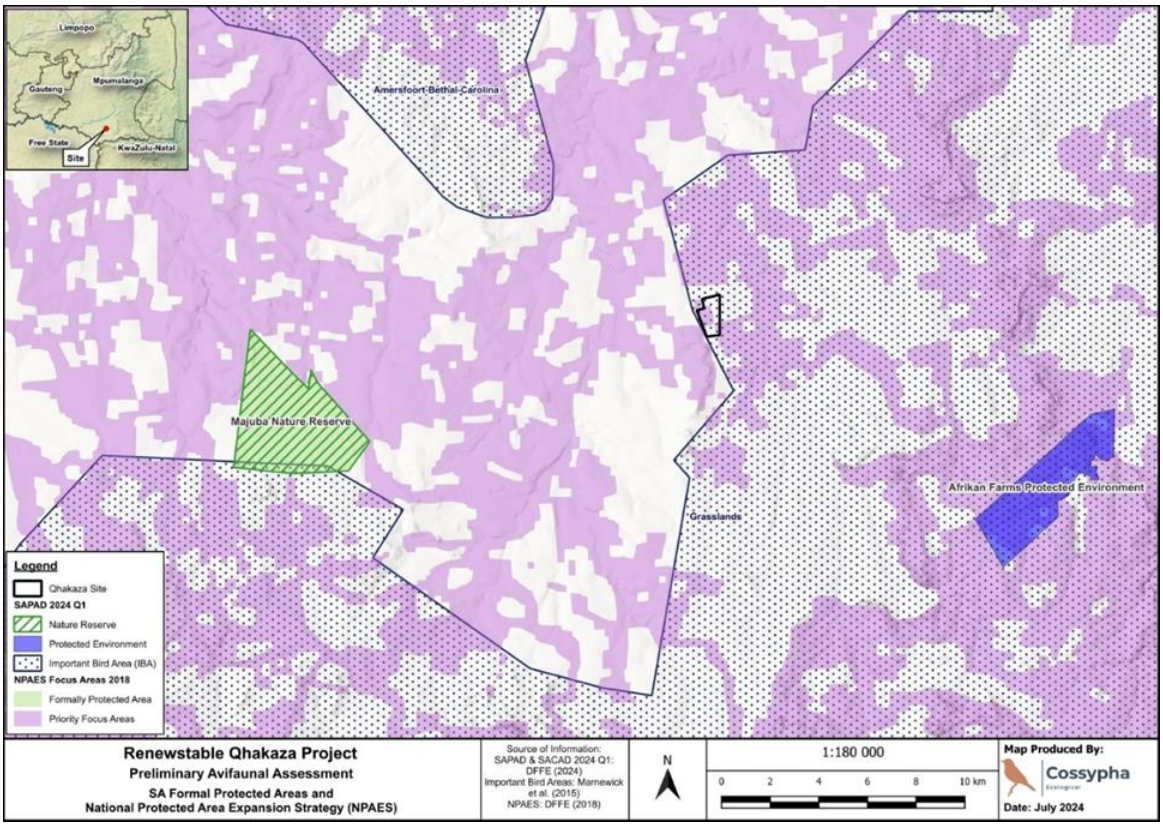


Figure 5: Nature Reserves and Important Bird Areas (Cossypha, 2024)

3.4.3 SURFACE INFRASTRUCTURE

This section describes the surface infrastructures within the study area, including a description of the road network and existing powerlines.

3.4.3.1 Existing Powerlines and Substations

There are existing 11kV and 22kV distribution powerlines within the proposed study area approximately 2.6 km from the eastern boundary. An additional 14km 132kV distribution line is proposed to connect the site to the grid.

3.4.3.2 Road Network

The primary access road to the proposed study area is the N11 to Volksrust, while secondary access to sites will be the existing access road from Road P48/3. The planned access to the site can be accessed via a gravel road. The existing road network will need to be upgraded to allow easy access to the site during construction and other project phases.

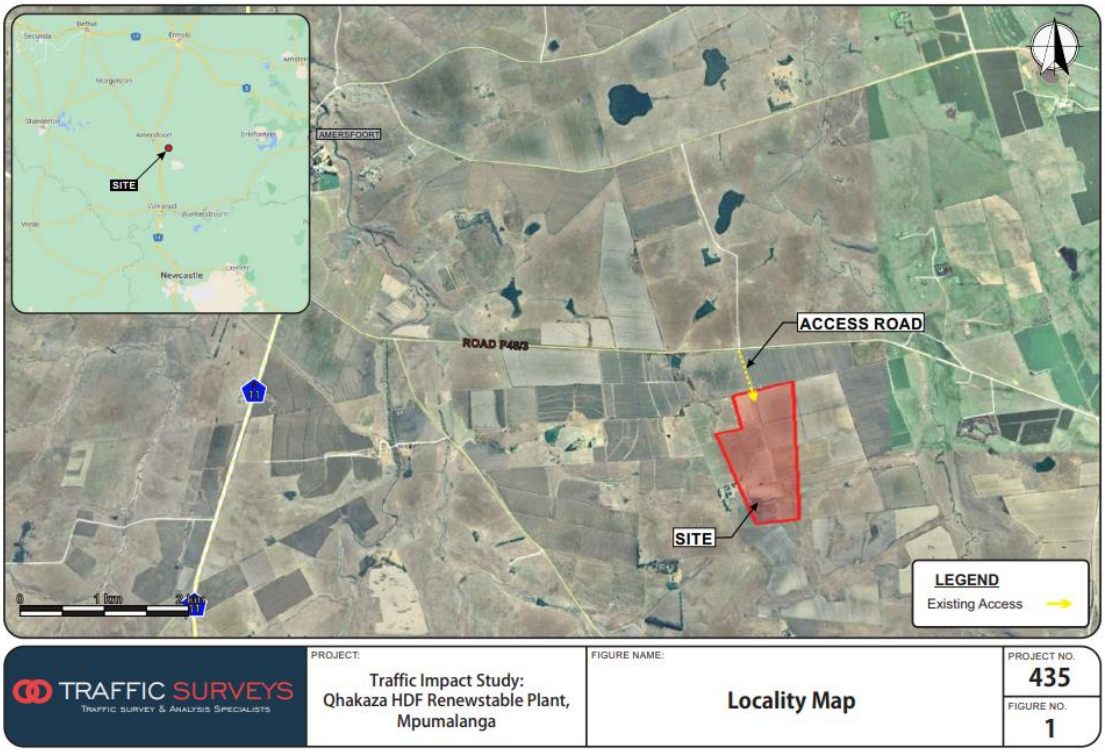


Figure 6: Road Network (Traffic Surveys, 2024)

3.4.4 OTHER SURROUNDING ACTIVITIES

The map below shows other activities within and around the proposed study site.

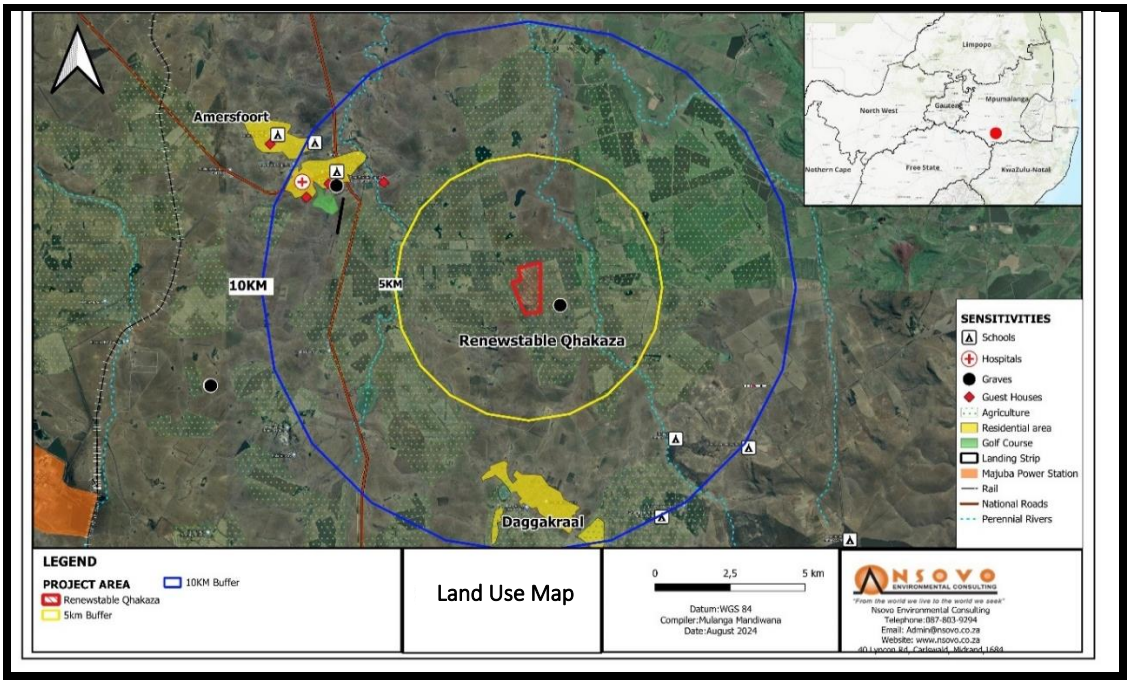


Figure 7: Land Use Map

4 A PLAN THAT LOCATES THE PROPOSED ACTIVITY OR ACTIVITIES APPLIED FOR, AS WELL AS ASSOCIATED STRUCTURES AT AN APPROXIMATE SCALE

Figure 8 presents the proposed activities at a scale of 1:100 000. The proposed activities presented are described in detail in Section 5.

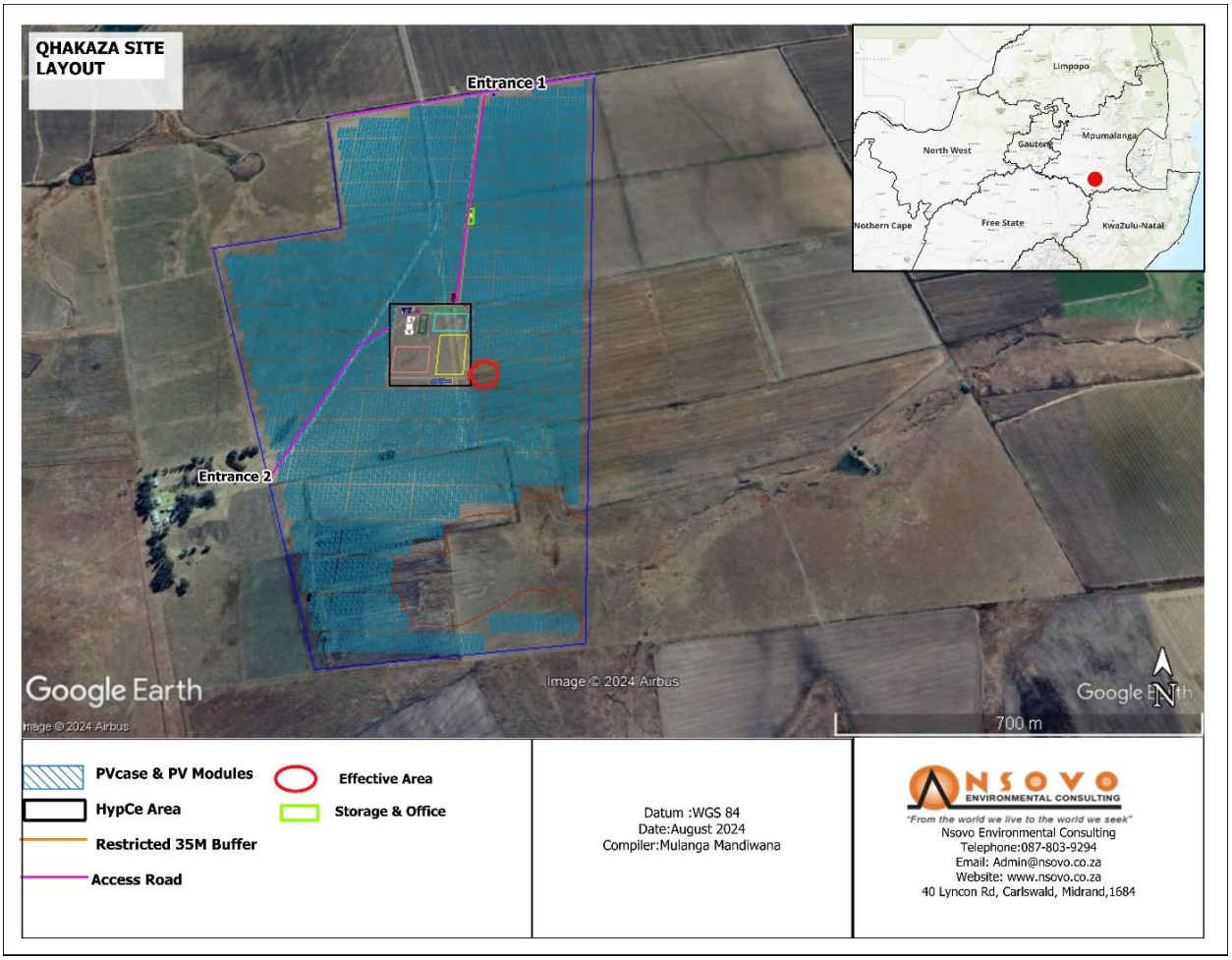


Figure 8 : Proposed activities Preliminary Layout at a scale of 1:100 (HDF-Energy, 2023)

5 DESCRIPTION OF THE PROPOSED ACTIVITY, INCLUDING ALL LISTED AND SPECIFIED ACTIVITIES TRIGGERED AND A DESCRIPTION OF THE ACTIVITIES TO BE UNDERTAKEN, INCLUDING ASSOCIATED STRUCTURES AND INFRASTRUCTURE

This section describes the proposed activities, including the proposed project's scope, focusing on the listed activities that trigger the ESIA process. It also describes the associated structures and infrastructure related to the proposed development.

5.1 PROJECT OVERVIEW

HDF-Energy proposes the development of a 34MW Renewstable®Qhakaza Power Plant, which is a high-capacity renewable power plant based on hydrogen BESS storage technology that harnesses renewable energy from a Photovoltaic (PV) Park and converts it into hydrogen using an electrolyser system. This hydrogen is stored in a compressed gas form; subsequently, when the photovoltaic park generates insufficient energy, the stored hydrogen is utilised to produce electricity for the grid through a fuel cell system. This innovative approach ensures a continuous and reliable power supply even when the PV park's energy production is inadequate. The system will only emit oxygen and water vapour as by-products.

The electricity produced by the plant will be purchased by a private(s) off-taker (s) at an agreed rate under the Power Purchase Agreement (PPA) for at least 25 years from the commissioning. The plant is scheduled to be commissioned in 2029 and will contribute to the greening of the local power grid and enhance the territory's energy independence.

The proposed development entails the following primary infrastructure:

Table 7: Primary Infrastructure with Power produced

Primary Infrastructure	Power Produces
Baseload electricity	25 MW morning, day, and evening- 6 MW night
Solar plant	80 MW
Electrolyzers	30 MW
Green H2 storage	132MWh
High-capacity fuel cells	6MW
Battery power	25MW
Battery storage	100MWh

Primary Infrastructure	Power Produces
Land required	110 hectares
Capacity factor	87%
Electricity production	356.16MWh daily 130 000 MWh yearly

Associated infrastructure includes the following:

- Hydrogen Power Centre
- Control Room
- Warehouse
- Access roads
- Communication DC and AC cables installed underground and overhead
- Fencing and security
- High Voltage Collector station that will be shared with other IPPS

Figure 9 depicts the proposed Renewstable® Qhakaza flow diagram; further details of the proposed activities are provided below.

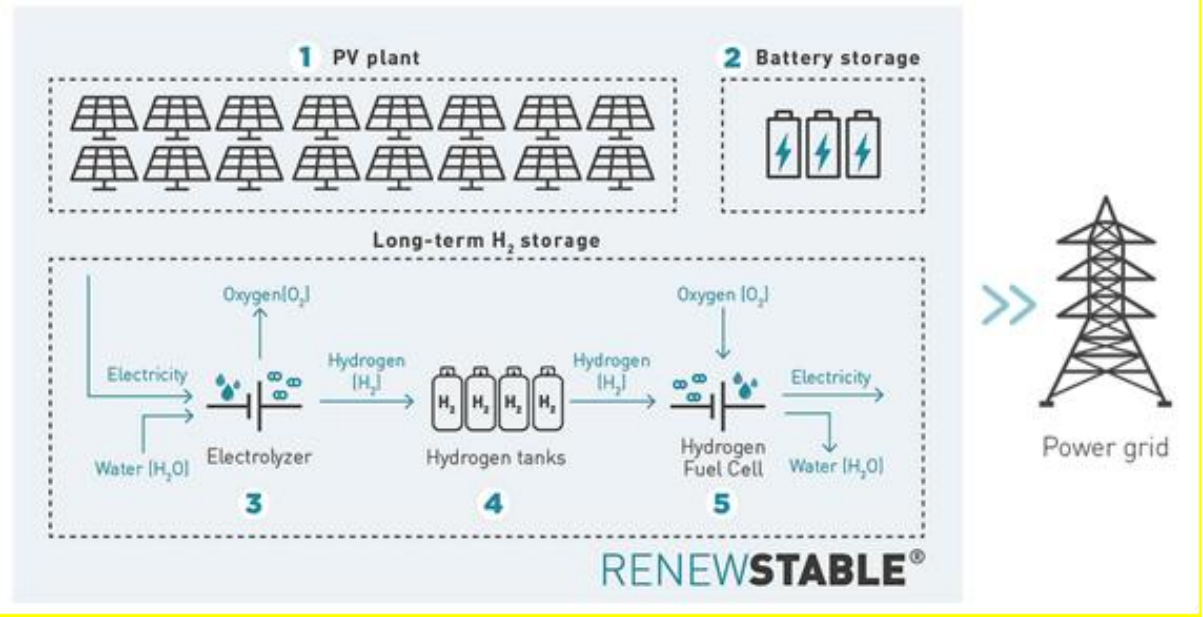


Figure 9: Proposed Renewstable® Qhakaza Process Flow Diagram

5.2 DESCRIPTION OF THE PROJECT'S MAIN COMPONENTS

The proposed development entails the following primary components:

Table 8: Components of the project

PV

When the sun shines, the solar power plant generates the carbon-free primary source of electricity for the Renewstable® Power Plant. A solar PV plant alone generates intermittent power, which raises an issue for the grid operator in balancing the grid and securing power generation. Moreover, the PV plant is associated with a long-term energy storage system, enabling it to deliver clean power and avoid the intermittent related to renewable energy sources on isolated grids.

The multi-MW photovoltaic plant has been designed to fit the site's specificities in terms of topography, land area, solar exposure, and density. The tracker-oriented structure is the chosen system as it maximises the power generated by the PV plant all day. The main equipment and materials included in the PV power plant are the modules, inverters, transformers, and structures. It will be purchased from tier-1 suppliers with adequate track records, performance guarantees, and products adapted to South Africa's specificities.

The 80 MWp PV solar panels consist of solar cells and modules made from semi-conductor material, primarily silicon-based. They will be fixed to a single-axis horizontal tracking structure, where they will tilt as the sun moves from east to west. Lightning protection poles will be installed, with a maximum height of up to 6 m. The panels will be mounted on steel frames and reinforced with cement into the ground. A drainage system will be designed to keep the site from flooding.

Technical Details

Project Technical Details	Capacity/Quantity
Installed (MW)	80MWp
Number of Modules	134 000
Invertors	18
Power Station	6

PV Park, tracker technology

Battery Energy Storage System ('BESS')

The Battery Energy Storage System ('BESS') provides the end-of-the-day peak power and, in combination with the hydrogen storage, ensures the stability of the electricity service. The BESS is an efficient system to provide short-term balancing with high responsiveness. Typically, the BESS will be able to balance the large drops in power generation within the power plant due to intense cloud cover, provide the end-of-the-day peak power to the grid when solar power is not available, and assist in maintaining sufficient power output after sunrise and before sunset.

In the Renewstable® Power Plant, BESS complements hydrogen for short-term energy storage and power regulation. The current leading technology, and more suitable for Renewstable®, is the Li-Ion BESS. BESS architecture is like a preassembled enclosure solution for easy plug-and-play integration. BESS integrates its safety features in the assembly.

The 25MW/100MWh BESS facility will occupy approximately 2 ha of land. The BESS stores electricity, provides the end-of-the-day peak power to the grid when solar energy is unavailable and assists in maintaining sufficient power output after sunrise and before sunset.

Technical Details

Electricity Supply technical details

Project Technical Details	Capacity/Quantity
Installed (MW)	25MW
Capacity (MWh)	100MWh
Enclosure	20ft container Number of units: 50
Power Station	Max Power Station: 4MW Number of Power Station: 7 Enclosure: Skid

Renewstable® Qhakaza BESS dedicated to Auxiliary Supply technical details

Project Technical Details	Capacity/Quantity
Installed (MW)	2,5 MW
Capacity (MWh)	10MWh
Enclosure	20ft container Number of Unit: 5
Power Station	Max Power Station: 0,5MW Number of Power Station: 5 Enclosure: Skid

Example of BESS installations – pre-assembled enclosure

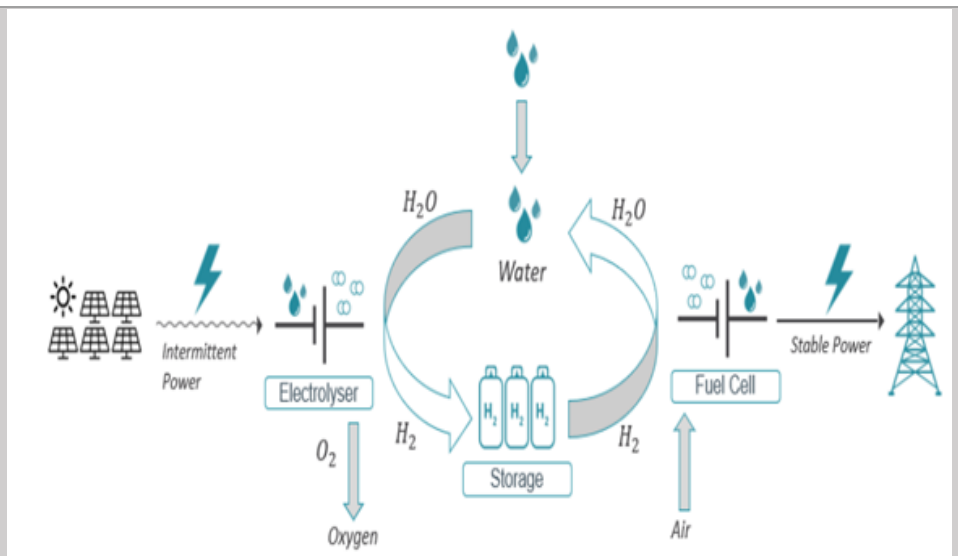
Hydrogen Chain principle: Water Cycle

The Renewstable® Power Plant produces energy based on a renewable source and the water cycle breaking/recomposition: turning electricity and water to hydrogen, storing it, and then using it when needed to produce water and electricity again. The hydrogen system is used for long-term energy storage.

1. The Electrolyser system splits the water molecule ($H2O$) into hydrogen and oxygen using the electricity generated from the PV plant; it is based on an electrochemical reaction called “water electrolysis.”
2. The oxygen is released into the atmosphere. Hydrogen is stored in gaseous form in pressure vessels.
3. The Fuel Cell executes the reverse operation: it produces power and water by combining hydrogen and oxygen.
4. The byproducts of this process are only oxygen and water; there are no harmful emissions whatsoever.

Both the electrolyser and the BESS can absorb solar power in parallel to maximise the power plant's storage capability during the day. Combining both storage technologies allows for optimising the use of the intermittent primary electricity source, solar.

Hydrogen chain principle



Electrolysis System

The electrolyser converts electricity from the photovoltaic park into hydrogen via electrolysis during the day. The electrolyzer is a system that produces hydrogen from the electrolysis of water. e system can use either PEM1 or alkaline-technology electrolysers with DC power to induce an electrochemical reaction (i.e., water electrolysis). The final products of the water electrolysis process will be hydrogen gas, which will be stored, and oxygen, which will be released into the atmosphere. The electrolysers will be housed in dedicated buildings according to the country's good industry practices. The buildings will be equipped with H2 detectors (set to 20% of the lower explosive limit) and ventilation switch detectors and will be actively ventilated to maintain a non-explosive atmosphere. In the case of the Renewstable® concept, the electrolyzer uses renewable energy to produce the hydrogen that will store the energy. Green hydrogen is one of the most promising ways to store renewable energy; HDF-Energy has put this potential into reality in a concrete and competitive application.

Technical Details

Project Technical Details	Capacity/Quantity
Installed (MW)	30 MWp
Technology	Alkalin
Chemicals present on site	KOH at 30%w: 75 m3
Enclosure	Building
Power Station	6

Example of Alkaline electrolysis system

Hydrogen Power Centre

Hydrogen Storage is a key to enabling the advancement of hydrogen and fuel cell technologies in applications including stationary power, portable power, and transportation. Hydrogen has the highest energy per mass of any fuel. Hydrogen requires the development of advanced storage methods that have the potential for higher energy density due to its low ambient temperature density, causing low energy per unit volume. Several types of hydrogen storage exist (gas, Cold/cryo compressed, and liquid), but gas storage is the more mature and less costly. The hydrogen gas produced from the electrolysis process will be compressed and stored in cylindrical steel tanks arranged horizontally.

The Renewstable® Qhakaza power plant will cover 7ha. It converts the electricity from the photovoltaic park into hydrogen through an electrolyser system, stores it in compressed gas form, and restitutes the electricity to the grid through a fuel cell system.

Technical Details | **Example of Alkaline electrolysis system**

Project Technical Details	Capacity/Quantity
Energy Stored	132 MWh (12 418kg)
Stored@ 300 bar	No Storage @300bar, only @30bar
Stored @30 bar	Volume per vessel: 115 m3 Number of vessels: 40 Dimensions: D: 2,8m, L: 22m

Fuel Cell

The hydrogen fuel cell has been identified as a critical solution in the clean energy transition for several decades. From mobility to backup power generators, the fuel cell has multiple applications aiming to decarbonise all sectors (power generation, mobility, industry, etc.). Benefiting from years of development of fuel cell technologies, HDF-Energy has designed a multi-megawatt power fuel cell dedicated to utility-scale stationary applications. The HDF-ENERGY Industry Fuel Cell uses Polymer Electrolyte Membrane (PEM) technology. The PEM technology is currently the most mature stack technology as it has demonstrated its reliability in various utilisations for mobility. The PEM fuel cells operate at relatively low temperatures (around 60°C), resulting in better durability, up to 40,000h. The fuel cell combines hydrogen and oxygen to produce carbon-free electricity and rejects water as steam. The total capacity of fuel cells will be housed in prefabricated and containerised enclosures for easy integration into the HyPCe area of the power plant. The hydrogen fuel cell enclosures will also be equipped with H2 detectors (set to 20% of the lower explosive limit) and ventilation switch detectors and will be actively ventilated to maintain a non-explosive atmosphere.

Technical Details

Project Technical Details	Capacity/Quantity
Installed (MW)	6 MW
Enclosure	Per 1,5MW unit : 2x 40ft cont + 1x 20ft cont Total units: 4

Example of Fuel Cell

Energy Management System

The Renewstable® Power Plant integrates an Energy Management System (EMS) that manages the energy storage system and the renewable producer, the PV plant, in real-time to ensure a stable power supply at the targeted power level.

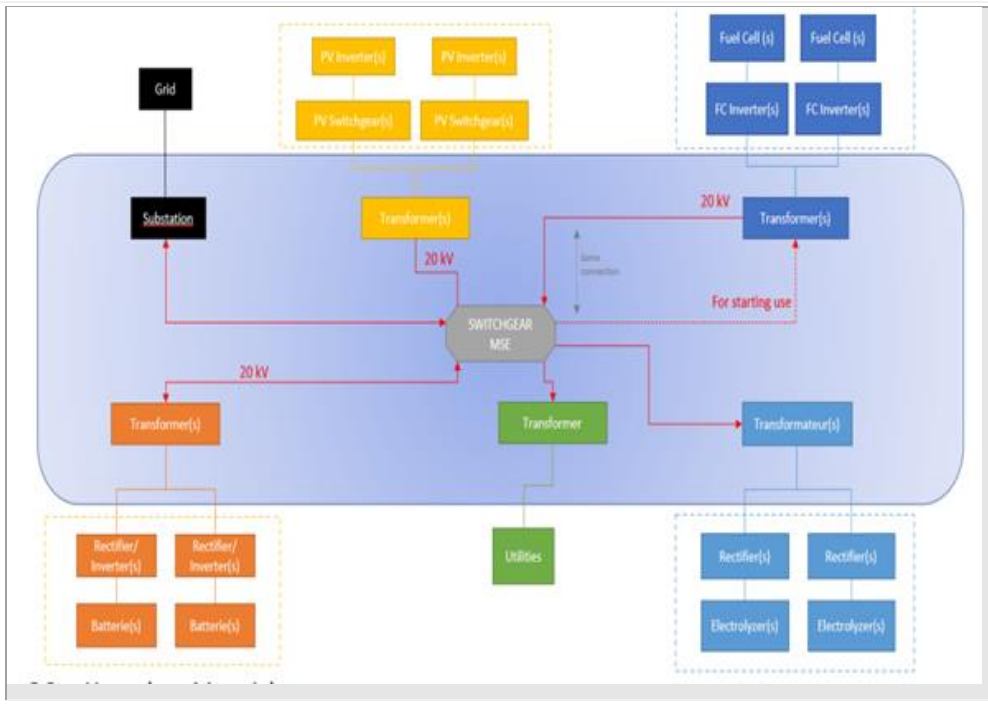
The Energy Management System is the power plant brain; it is responsible for ensuring the balancing of the different systems composing the power plant:

1. The PV plant is a renewable energy source.
2. When the PV is produced, the EMS distributes the energy to deliver the due power to the grid and charge the energy storage through hydrogen production in the electrolyzer and the battery.

When the PV is not sufficient to deliver the due power, the EMS will order the battery or the fuel cell to deliver power.

Power Plant Architecture

The principle electrical architecture of the power plant is presented in the figure.



Grid Connection

The grid connection will primarily be a 132kV 14km powerline, and the maximum export capacity will be 34 MVA. The requisite Collector station will be shared with other IPPs. The HV substation is the Majuba Coal Power substation. ***An Environmental Authorisation will be undertaken separately for the Grid connection***.

Project Technical Details	Capacity or Quantity	
Connection to the Grid	Max Export Capacity	34MVA
	Voltage	132Kv
Collector Station	Assets shared with other IPPs	
HV Substation	Majuba Coal Power Substation	
Associated Infrastructure	Cables: Communications DC and AC cables installed underground and overhead. AC cabling up to 33kV between components (underground and overhead cabling). A step-up transformer from 33kV to 132kV to connect the 132kV overhead power lines at the Point of Common Coupling with Eskom. TBC by ESKOM.	

Other Infrastructure

Buildings	Several buildings are proposed for the Project Property and will be amalgamated where possible without compromising Project requirements for efficiency, power, functionality, and safety. Proposed Project buildings, which include, for example, guard buildings/security booth, office/equipment storage buildings, are anticipated to **occupy a total of approximately 3 ha within the Project Property**. The approximately 7 ha for the HyPCe area (or HyPCe facilities yard) will also contain buildings such as an electrical building, electrolysers building, power stations and various utilities on the skids, a pump house, and a package water treatment plant. Laydown areas will be required for the outdoor storage of vehicles, heavy equipment, machinery, prefabricated Project components, construction materials, and other construction, operation, and maintenance supplies. They will also include platforms for equipment assembly/installation.
Access/Service Roads	Internal site roads and parking areas throughout the Project Property will facilitate the transportation of Project personnel, equipment, and materials/supplies within and between the solar PV power plant, the HyPCe area, and the entrances. These roads will range between 3 m and 10 m in width. The main roads, HyPCe area access roads, and roads to and within the administrative area, including the parking area, will be asphalted paved; the remainder of the internal site roads will be unpaved.
Fencing and Security	The Project Property will be surrounded by fencing on all sides, and the HyPCe area will be enclosed by a security fence approximately 2.5 m high. Adequate 24-hour security will prevent curious onlookers or passers-by from wandering into Project-related construction or operational areas.
Site lighting	General site lighting will combine power line pole-mounted fixtures and building-mounted fixtures at the guard's buildings/security booths, staff buildings/facilities, office/equipment storage buildings, and other miscellaneous buildings. Project components and facilities are not anticipated to be permanently lit; detection sensors or manual switches will be used to engage lighting when required for operational tasks and security or safety reasons.
Hazardous Materials	The primary hazardous materials that will be present on-site include: 1. Petroleum Hydrocarbon 2. Li-ion batteries 3. Potassium hydroxide (KOH), also known as caustic potash

	4. Glycol 5. Pressure gaseous hydrogen Oil in electrical transformers
Water Usage and Ablution	The primary water sources are still being investigated. The anticipated annual consumption is 69 621 m3/y, and water discharge is 20 886 m3/y.
Waste Management	All waste generated on site will be handled per the Renewstable Qhakaza plant Waste Management Plan and the approved EMPr. Solid and liquid waste destined for off-site disposal will be temporarily stored in waste bins, containers, or water-tight barrels. Approved third-party service providers will be engaged to remove non-hazardous and hazardous wastes for off-site disposal, recycling, and/or treatment at dedicated waste management facilities in accordance with applicable regulatory requirements. Waste containment receptacles containing food wastes will be secured to prevent birds or other wildlife attractions. Efforts will be made to divert solid waste materials from the landfill through re-use or recycling wherever practical. Construction demolition waste, such as concrete, steel, scrap iron, and wood, will be collected and temporarily contained on-site in a designated area until it can be transported to an approved existing disposal facility or landfill site.

5.2.1 Activities Associated with the Project

The power plant will provide a mid-merit power profile to the national grid. It will be designed to operate for 25 years, after which, subject to prevailing circumstances, it will either be decommissioned or refurbished and extended. If decommissioned, the land where the power plant is located will undergo extensive rehabilitation, removing all power plant equipment and reinstating the land to its original land use.

The proposed project's construction phase will start in 2027/2028 and take approximately 28 months. Commercial operation would then begin in the first quarter of 2029. The electricity produced by the plant will be purchased by a private off-taker at an agreed rate under a Power Purchase Agreement (PPA) for at least 25 years from the plant's commissioning.

The main activities associated with the project's construction phase will consist of site preparation, physical construction and equipment installation, and finalisation commissioning. During peak construction activities, such as installing the PV modules, the project is expected to create approximately 300 employment opportunities.

Significant aspects to note during the construction phase include the following:

- The Bergvliet parcel offers the opportunity to refurbish and use existing Eskom buildings in an apparent good structural state. This place can become a worker's camp during construction and become the vibrant heart of the green hydrogen industry in the country during operation. This “green hydrogen centre” could be:
    - A centre of training where students are hosted
    - Visit of the public
    - Partnership with universities to be discussed
    - HDF office for Mpumalanga
    - Building for electrolysers
- The Project components required for physical construction and equipment installation will be transported to the project property by truck, primarily in 12-m shipping containers. Some raw materials may be transported in bulk, and the hydrogen tanks will be transported as out-of-gauge cargo.
- Construction activities will take place only during daylight.

The proposed development will ultimately include constructing and assembling the above-associated infrastructures. Table 9 details the main activities associated with the project construction phase.

Table 9: Construction phase activities

Activity	Plants Facility (PV power Plant, BESS, HyPCe)	Access road
Site walk down	Site walk down to determine sensitivities and demarcate areas of sensitivity as a no-go.	Site walk down the access road to determine sensitivities and mark them as a no-go.
Site Preparation	Project construction will begin with clearing vegetation and levelling soil where necessary throughout the Project Property. Only light vegetation removal will be required since the project property is currently primarily used for crop farming and is therefore not forested or heavily vegetated other than with agricultural cry laydown areas will be established for the outdoor storage of vehicles, heavy equipment, machinery, prefabricated Project components, construction materials, and other supplies. Site preparation activities will also include platform levelling for the HyPCe buildings, digging trenches and constructing the drainage system for surface runoff management.	Site preparation activities will also include access road construction and internal road construction.
Vegetation clearance	Vegetation clearance of the ±110 hectares footprint.	Clearance of 4m width for access roads.
Excavation of foundations	Excavation of foundation and concrete works for the plant (Solar PV HyPCe area, BESS, etc.).	No foundations are required for the access road.
Civil works	Construction of solar PV power plant, including: • PV structure foundation • Structure assembly • Modules installation • Power station installation Construction of HyPCe area facilities (i.e., BESS, HESS, and EMS), including: • Foundation construction	The civil works will entail the preparation of proper drainage channels and surfacing of the roads.

Activity	Plants Facility (PV power Plant, BESS, HyPCe)	Access road
	• Electrical building • Installation of integrated systems, containers, and associated power stations for batteries, electrolysers, and fuel cells. • Erection of electrical and mechanical balance of plant components (e.g., cabling, piping, and auxiliaries). Construction/installation of remaining supporting infrastructure, facilities, and utilities, including other Project buildings (e.g., guard building/security booth and office/equipment storage building), fencing, lighting, package water treatment plant, water storage tanks, and drainage works.	
Technical/ Mechanical	Mechanical activities to prepare for operation.	Surfacing the road.
Rehabilitation	Upon completion of construction work, the site will be rehabilitated as per the specifications of the EMPr and approved Method Statements and will meet the Closure and Rehabilitation Plan requirements. The rehabilitation activities will include: • Remove excess rubble and building material. • Repairing any damage caused by construction activities. • Rehabilitating any area affected by engineering activities undertaken while constructing the proposed facility and its associated infrastructure. • Reinstating damaged roads as the result of either construction vehicles or any construction work related to the development of the Renewstable Qhakaza. • Replacing topsoil and planting indigenous vegetation where necessary.	

5.2.2 OPERATION AND MAINTENANCE

The maintenance of the Renewstable® Qhakaza plant is comparable to the maintenance of any renewable power plant. In this case, the architecture of the design provides redundancy and flexibility, which means that maintenance can be done in hidden times, implying that no projected downtime due to annual maintenance is expected. The main activities associated with the operation and maintenance of the proposed Renewstable® Qhakaza are detailed as follows:

- The solar power plant will be cleaned and undergo light preventive and corrective operations (changing fuses and modules, inspecting inverters and cables, etc.).
- The EMS will enable aspects of the power plant and energy storage systems (i.e., the BESS and HESS) to be controlled remotely during Project operations. Since Project components in the HyPCe area will be mainly automated, the operator's primary job will be to monitor the infrastructure (including associated cooling, fire safety, security, and fault detection systems) to support their safe, secure, and efficient operation.
- Operation and maintenance of the power plant and associated energy storage and management systems in the HyPCe area will entail:
    - Regular visual inspections of the PV modules, cables, power stations, and other equipment; thermal control of electrical equipment (e.g., boxes and inverters); cleaning of the PV modules;
    - Grass cutting within the grounds of the power plant to manage the vegetation in specific areas; transformer oil sampling and testing, and potential transformer retreatment (if necessary) at a specialised third-party facility off-site; and
    - Control water quality (electrolysis input and output) through filtration, treatment, product changing when necessary; and waste management.
- Maintenance activities will also include corrective or preventative replacement of components such as electrolyte solutions, PV modules, inverters, battery cells, and fuel cell stacks.
- For these critical subsystems, an LTSA (Long-Term Service Agreement) will be executed with the suppliers so that the supplier is responsible for the specific maintenance and long-term performance of the subsystem.
- The power plant operation may require Full-Time Employees (FTEs): operators, electrical and mechanical technicians, and management.

During the various phases of the project, HDF-Energy plans to encourage the transfer of knowledge to the local technical community. Secondary activities such as security, greenspace management, logistics, and training would also be subcontracted.

HDF-Energy will assemble a team that will be responsible for operations and maintenance. The team's primary responsibilities entail the following:

- Performance monitoring: power delivery to the grid, Grid Code, Safety, Health & Environment (HSE) rules
  • Remote operation, diagnosis, and failure response
- Maintenance strategy: preventative maintenance
- Corrective maintenance

- Consumables management, spare parts, and scheduled maintenance
- Waste management, vegetation mowing, site and office cleaning, site security

5.2.3 DECOMMISSIONING

The Project will be designed, built, and maintained to be in operation for at least 25 years. While decommissioning or abandonment of the new facility is not currently envisioned, the Project will at some point be decommissioned or rebuilt at the end of its useful service life in accordance with the applicable standards and regulations that are in effect at that time. Potential future decommissioning activities will likely involve the following:

- Dismantling and removal of the power plant and other on-site buildings, equipment, and facilities, including:
    - possible excavation and removal of concrete pads;
    - transferring of waste materials to disposal, recycling, and/or treatment facilities, as applicable (where re-use is not possible);
    - backfilling of ponds and ditches and re-establishment of natural drainage patterns; and
    - recontouring and revegetation (via natural regrowth and/or seeding with non-invasive plant species) of disturbed areas of the site as necessary to facilitate the desired end land use of the Project Property by the landowner (Eskom).

5.3 LISTED ACTIVITIES APPLICABLE TO THE PROJECT

The proposed development triggers listed activities in terms of 2014 EIA Regulations as amended, the National Water Act, 1998 (Act 36 of 1998), and the National Environmental Management: 1998 (Act 39 of 1998). The listed activities applicable are listed and briefly described in Table 10 below:

Table 10: Listed activities applicable to the project

Listed Activity		Describe the portion of the proposed project to which the applicable listed activity relates.
Applicable activities listed under the EIA Regulations of 2014 as amended – Listing Notice 1		
GNR 983 Activity 12	*The development of infrastructure or structures with a physical footprint of 100 square metres or more where such development occurs-* *(a) Within a watercourse*	The proposed Renewstable®Qhakaza entails developing infrastructure with a footprint of more than 100m2 and will encroach on a watercourse.
GNR 983 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 metres from (i) a watercourse.	The proposed development will require the removal of more than 10m3 soil during excavation for the Solar PV foundations within 500m of a watercourse.
GNR 983 Activity 24	*"The development of a road:* *(ii) A road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than **8 meters**."*	The proposed project will require the development of a ± 10m wide access road to the development site and associated infrastructure.
GNR 983 Activity 28	*Residential, mixed, retail, commercial, industrial, or institutional developments where such land was used for agriculture, game farming, equestrian purposes, or afforestation on or after 01 April 1998 and where such development:* *(ii)will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for residential, mixed, retail, commercial, industrial, or institutional purposes.*	The proposed development will be outside an urban area on land zoned agriculture. The land parcel is 117 hectares, and the footprint and associated infrastructure will be ±110hectares.
GNR 983 Activity 56 (ii)	*The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre—* *(ii) where no reserve exists, where the existing road is wider than 8 metres*	The proposed development will require widening and lengthening the existing access roads by more than 6 m and 1 km, respectively.
Applicable activities listed under the EIA Regulations of 2014 as amended – Listing Notice 2		

Listed Activity		Describe the portion of the proposed project to which the applicable listed activity relates.
GNR 984, Activity 1	*"The development and related operation of facilities or infrastructure for generating electricity from a renewable resource where the electricity output is 20 megawatts or more".*	The proposed Renewstable®Qhakaza entails developing a 34 MW Solar PV plant outside an urban area.
GNR 984, Activity 4	*The development and related operation of facilities or infrastructure, for storing, storing, and handling a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.*	The hydrogen gas produced from the electrolysis process will be compressed and stored in cylindrical steel tanks arranged horizontally, with a combined capacity of more than 500 cubic meters.
GNR 984, Activity 6	*"The development of facilities or infrastructure for any process or activity which requires a permit or license or an amended permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or affluent."*	The proposed project entails electricity generation and will require a Generation Licence from the National Energy Regulator of South Africa (NERSA) in terms of Section 11 of the Electricity Act (Act 4 of 2006). The proposed development will require a Water Use License (WUL) under the National Water Act (Act 39 of 2004) (NWA). Other required permits will include biodiversity and heritage permits for NEMBA and NHRA, respectively.
GNR 984, Activity 15	*"The clearance of an area of 20 hectares or more of indigenous vegetation"*	The proposed site is approximately 117 hectares, and more than 20 hectares of indigenous vegetation will be removed for construction purposes.
Applicable activities listed under the EIA Regulations of 2014 as amended – Listing Notice 3		
GNR 985, Activity 4 f, i, (cc) and (ee)	*The development of a road wider than 4 metres with a reserve of less than 13.5 metres.* *f. Mpumalanga* *i. Outside urban areas:* *(cc) Sensitive areas as identified in an environmental management framework as*	The proposed development will require a 10 m wide access road within a Critical Biodiversity Area 2 and other natural areas in an urban area.

Listed Activity		Describe the portion of the proposed project to which the applicable listed activity relates.
	contemplated in Chapter 5 of the Act and as adopted by the competent authority *(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;*	
Activity 12 f, ii	*The clearance of an area of 300 square metres or more of indigenous vegetation.* ***f. Mpumalanga*** *ii. Within critical biodiversity areas identified in bioregional plans;*	The proposed development will require clearance of more than 300 m^2 of indigenous vegetation within critical biodiversity areas for construction purposes.
GNR 985, Activity 14 ii, a, f, (i), (dd) and (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;* ***f. Mpumalanga*** *i. Outside urban areas:* *(dd)Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority* *(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in* *bioregional plans*	The proposed development footprint will be more than 10m^2 within a watercourse outside urban areas. The site is identified as a critical biodiversity area.

Furthermore, the proposed development triggers Section 21 water use activities, as detailed in Table 11 below; as such, a Water Use Licence Application (WULA) in terms of Section 40 of the National Water Act, 1998 (Act No. 36 of 1998) (NWA) will be undertaken to obtain a Water Use Licence (WUL) from the Department of Water and Sanitation (DWS) before the commencement of any listed water use activity. The application has been lodged with the responsible authority, the DWS.

Table 11: Listed Activities under Section 21 of NWA, 1998

The National Water Act, 1998 (Act 36 of 1998) Activities	
Section 21 (a) *21 (a) taking water from a water resource*	Water for consumption and construction would be sourced from a borehole drilled on the site. A borehole will be the primary source of water supply on-site.
Section 21 (c) *21(c) Impeding or diverting the flow of water in a watercourse; and*	Construction of roads and culverts within medium sensitivity buffer zone. The proposed development is close to a watercourse (wetland).
Section 21 (i) *21(i) Altering the Bed, Banks, Course, or Characteristics of a Water Course*	The proposed development is close to a watercourse (wetland).
Section 21 (g) *21 (g) Disposing of waste in a manner which may detrimentally impact on a water resource*	The construction of a septic tank and Brine Pond.

Considering the available information, no waste-related activities as per NEM: WA Section 21 are triggered; therefore, a Waste Management Licence is not required. The storage, handling, and management of waste on-site will be dictated by the EMPr, associated norms and standards, and Municipal by-laws.

6 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 RESPONSE TO THE LEGISLATION AND POLICY CONTEXT

6.1 LIST OF APPLICABLE ACTS AND REGULATIONS

IEM prescribes a code of practice for ensuring that environmental management principles are fully integrated into all stages of the development process. It advocates using several environmental and management tools appropriate for the various levels of decision-making. The most comprehensive set of legislative tools to date that provides a legislative framework that allows IEM to be rolled out is the Specific Environmental Management Acts (SEMA), which are sector-specific and linked to NEMA. These include NEM: WA (waste), NEM: AQA (air quality), NEM: BA (biodiversity), NWA (water resources), NEM: PAA (protected areas), and in some instances, NEM: ICMA (coastal management). In addition to the SEMAs, every developmental project must comply with international, national, provincial, and local legislation, regulations, strategies, and policies to manage environmental impacts.

The EIA Regulations of 2014, as amended, under Appendix 2 Section 1(e), requires a description of applicable legislation in the Scoping Report. This section lists and describes the acts and legislations applicable to the proposed development and associated infrastructure. A list of the current South African environmental legislation that is pertinent to the proposed development is described in Table 12 below. It is not an exhaustive analysis; however, it provides a guideline for the relevant aspects of each legislation.

Municipal policies, plans, by-laws, Renewstable Mpumalanga internal policies, and world best practices were considered during the ESIA process.

Table 12: Legislation Pertaining to the Proposed Project

Legislation	Administering Authority:	Summary	Applicability
The Constitution of the Republic of South Africa (Act 108 of 1996)	All Spheres of Government	The Constitution is the supreme law of the Republic of South Africa, so statutes must be in line with it. Section 24 indicates that everyone has the right to an environment that is not harmful to one's health or well-being. That Right includes an obligation imposed on the State to protect the environment for the benefit of present and future generations.	The proposed development must consider the best environmental management practices during the project's life cycle.
National Environmental Management Act (Act 107 of 1998)	National and Provincial	The Act requires that an environmental authorisation must be issued before a listed activity may commence. Section 24(4) of NEMA prescribes that the procedures for the investigation, assessment, and communication of the potential consequences or impacts of activities on the environment must, among other things, with respect to every application for environmental authorisation, ensure that the general objectives of Integrated Environmental Management (IEM) are considered. Section 24(2) indicates that the Minister can publish a list of activities that may not commence without environmental authorization. Three listing notices, Listing Notice 1, 2, and 3, were published in 2014 and amended on the 7th of April 2017 to determine whether a Basic Assessment or Scoping and Environmental Impact Assessment should be undertaken. NEMA also provides for the duty of care and remediation of environmental damage. This duty is set out in section 28 and is imposed on every person "who causes, has caused or may cause significant pollution or degradation	The proposed development triggers "listed activities," as defined by NEMA, therefore requiring an EA from the relevant Competent Authority (CA), in this case, the DFFE according to Section 24C. Furthermore, the DFFE screening tool has been consulted from the project onset, and a copy of the report has been uploaded together with the application form. The DFFE screening tool was also used to guide the specialist studies required; thus, the list corresponds with the specialist studies identified in the screening tool report submitted to the DFFE **(Appendix C).**

Legislation	Administering Authority:	Summary	Applicability
		of the environment. Section 30 further indicates the procedures for reporting incidents and the need to implement remedial measures that deal with incidents.	
National Environmental Biodiversity Act (Act 10 of 2004)	National and Provincial	The National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. The following regulations, strategies, and frameworks emanate from this Act: • Alien and Invasive Species Regulations, 2014 • South Africa's • National Biodiversity Strategy and Action Plan (NBSAP) • National Spatial Biodiversity Assessment (NSBA) • National Biodiversity Framework (NBF, 2009)	The sensitivity of the PAoI has been mapped, and sensitive areas have been flagged to allow for the creation of buffers and protection. The requisite application will be submitted to the provincial department, where protected species have been identified and mapped within the construction footprint. The DFFE Biodiversity Directorate and the Protected Areas Planning and Management Effectiveness will be consulted.
National Environmental Management: Protected Areas Act	National and Provincial	The Act protects and conserves ecologically viable areas representative of South Africa's biological diversity. Section 17 declares areas protected. Any development envisaged in a protected area would require approval from the responsible management authority.	The site's sensitivity has been mapped, and sensitive areas have been flagged to allow for buffers and protection of protected areas. The site is 12 km from the Afrikan Farms Protected Environment, but it is not within a protected area.

Legislation	Administering Authority:	Summary	Applicability
National Environmental Management: Air Quality Act (Act No. 39 of 2004)	Municipalities	The Act's purpose includes reforming the law relating to air quality and providing national norms and standards regulating air quality monitoring, management, and control in the country. It also gives effect to S24 of the Constitution. Apart from imposing an obligation on metropolitan and district municipalities to implement the licensing system, a list of activities has been published, which indicates activities that require an Air Emission Licence (AEL).	The proposed project is in an air quality priority area. None of the proposed activities triggers Section 21 of this Act; however, the proposed projects must consider climate change and global warming issues.
National Environmental Management: Waste Act (Act No. 59 of 2008)	National and Provincial	The Act's purpose includes reforming the law regulating waste management to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation, securing ecologically sustainable development, and remediating contaminated land. A list of activities has been published indicating activities requiring a Waste Management Licence (WML).	No waste-related activities as per NEM: WA Section 21 are triggered; therefore, a Waste Management Licence is not required. The EMPr, associated norms and standards, and Municipal by-laws will dictate the on-site storage, handling, and management of waste.
National Water Act (Act No. 36 of 1998)	National and Provincial	The Act seeks to ensure that the country's water resources are protected, used, developed, conserved, managed, and controlled in a manner that considers relevant factors such as meeting the basic human needs of present and future generations. It further lists the 11 water uses specified in Section 21 that require a licence/ General Authorisation.	Some of the proposed activities will encroach on water resources, including watercourses and wetlands. This is expected for the proposed culverts and loops along the corridor. Therefore, the requisite WUL application must be lodged with the DWS for the sites that trigger Section 21 listed activities. Applications for the proposed

Legislation	Administering Authority:	Summary	Applicability
			scope will primarily trigger Section 21 a, c, i and g.
National Heritage Resources Act (Act No. 25 of 1999)	National and Provincial	The purpose of NHRA is to introduce an integrated and interactive system for managing national heritage resources. Any development that falls within the ambit of the developments described in the Act and/or involves an impact on heritage resources must comply with the requirements of the NHRA. Permits for this specific project would be administered by the Provincial Heritage Agency or South African Heritage Resources Agency (SAHRA).	The scoping phase confirmed the presence of graves 600m east of the project site. As such, the measures proposed by the specialist must be adhered to, and the requirements of the legislation regarding the preservation of graves must be considered.
Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)	National, Provincial, and Local	The Act aims to provide control over the use of natural agricultural resources to promote the conservation of soil, water resources, and vegetation and combat weeds and invader plants. Section 6 of the Act makes provision for control measures to be applied to achieve the objectives of the Act. In addition, there is also draft legislation, namely, Sustainable Utilisation of Agricultural Resources.	The proposed project is on agricultural land. Measures relating to soil, water, and vegetation conservation and the management of alien invasive species must be considered and form part of the EMPr.
Noise Control Regulations in terms of the Environmental Conservation, 1989 (Act 73 of 1989)	Municipality	The assessment of impacts relating to noise pollution management and control, where appropriate, must form part of the EMPr.	Noise generated during the project's construction and operational phases must comply with the provincial Noise Control Regulations.

Legislation	Administering Authority:	Summary	Applicability
Electricity Regulation, 2006 (Act 4 of 2006)	National	This act provides the national regulatory framework for the electricity supply industry to make the National Energy Regulator the custodian and enforcer of the national electricity regulatory framework; to provide for licenses and registration as how generation, transmission, distribution, reticulation, trading, and the import and export of electricity are regulated; to regulate the reticulation of electricity by municipalities, and to provide for matters connected to it.	The proposed project is an electricity generation project.
National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)	National	The purpose of this Act is to provide for the protection, conservation, and management of ecologically viable areas representative of South Africa's biological diversity and natural landscapes.	The site is not within the South African Protected Areas, so this Act may not necessarily apply.
National Road Traffic Act (Act No. 93 of 1996)	National, Provincial, and Local	An abnormal load vehicle permit will be required to transport the various solar power plant and transmission line components to the site for construction. These include: • Route clearance and permits for vehicles carrying abnormally heavy or abnormally dimensional loads will be required. • Transport vehicles exceeding the dimensional limitation (length) of 22m.	The constriction phase will entail delivering components that may sometimes be abnormal loads. At all times, the project will need to comply with the Act's requirements and apply for permits as required.

Legislation	Administering Authority:	Summary	Applicability
Occupational Health and Safety Act (OHS Act	National	The Major Hazard Installation (MHI) regulations (July 2001) published under Section 43 of the Occupational Health and Safety Act (OHS Act) requires employers, self-employed persons, and users who have on their premises, either permanently or temporarily, a major hazard installation or a quantity of a substance which may pose a risk (our emphasis) that could affect the health and safety of workers and the public to conduct a risk assessment in accordance with the legislation. Following legislation, the risk assessment must be done by an approved inspection authority (AIA) registered with the Department of Labour and accredited by the South African Accreditation Systems (SANAS) before construction of the facility.	The project must comply with the requirements of the Act throughout the project phases. Installation of gas tanks and gas pipelines will need to comply with the requirements of the Act.
Hazardous Substance Act, 1973 (56 of 1973)		The Hazardous Substances Act controls hazardous substances' production, import, use, handling, and disposal. Under the Act, hazardous substances are defined as substances that are toxic, corrosive, irritant, strongly sensitising, flammable, and pressure-generating under certain circumstances and may injure, cause ill health, or even death in humans.	The project will generate hazardous waste, which will be handled in accordance with the requirements of the Act and applicable norms and standards. Furthermore, the project comprises a highly flammable hydrogen plant; as such, the requirements of the Act must be adhered to.
Gas Act, 2001 (48 of 2001)		The Gas Act 48 of 2001 intends: • to promote the orderly development of the piped gas industry; • to establish a national regulatory framework; • to establish a National Gas Regulator as the custodian and enforcer of the national regulatory framework; and	The project will generate Hydrogen gas, therefore, this act must be complied with.

Legislation	Administering Authority:	Summary	Applicability
		• to provide for matters connected therewith. The objects of this Act are to: (a) promote the efficient, effective, sustainable, and orderly development and operation of gas transmission, storage, distribution, liquefaction, and regasification facilities and the provision of efficient, effective, and sustainable gas transmission, storage, distribution, liquefaction, re-gasification, and trading services; (b) facilitate investment in the gas industry. (c) ensure safety and efficiency—economical and environmentally responsible transmission, distribution, storage, liquefaction, and gas re-gasification. (d) promote companies in the gas industry owned or controlled by historically disadvantaged South Africans using license conditions to enable them to become competitive. (e) ensure that gas transmission, storage, distribution, trading, liquefaction, and re-gasification services are provided equitably and that all parties concerned consider the interests and needs of all parties concerned. (f) promote skills among employees in the gas industry; (g) promote employment equity in the gas industry. (h) promote the development of competitive markets for gas and gas services. (i) facilitate gas trade between the Republic and others.	

Legislation	Administering Authority:	Summary	Applicability
		(j) promote access to gas affordably and safely.	
Mpumalanga Nature Conservation Act, 1998 (Act No. 10 of 1998)	Provincial	This Act makes provisions with respect to nature conservation in the Mpumalanga province. It provides for, among other things, wildlife protection, hunting, fisheries, endangered fauna, and flora as listed in the Convention on International Trade in Endangered Species of Wild Fauna and Flora, the control of harmful animals, freshwater pollution, and enforcement.	The project is 12km away from the Afrikan Farms Protected Environment.
Climate Change Bill (2018)		The objects of the Act are to: a) provide for the coordinated and integrated response to climate change and its impacts by all spheres of government by the principles of cooperative governance; b) provide for the effective management of inevitable climate change impacts through enhancing adaptive capacity, strengthening resilience, and reducing vulnerability to climate change to build social, economic, and environmental resilience and an adequate national adaptation response in the global climate change response. c) make a fair contribution to the global effort to stabilise greenhouse gas concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe and in a manner that enables economic, employment, social and environmental development to proceed sustainably.	Climate change consideration must be incorporated in the design and the objects of the Act adhered to.

Legislation	Administering Authority:	Summary	Applicability
		The National Greenhouse Gas Emission Reporting Regulations have been promulgated in terms of NEM: AQA to introduce a single national reporting system for the transparent reporting of greenhouse gas emissions. The regulations apply to the categories of emission sources listed in Annexure 1 to the regulations and include electricity production exceeding 10 MW. Tier 1 reporting is required at a minimum, with a five-year grace period applicable before reporting to the lower tiers.	
Spatial Planning and Land use Management Act, 2013 (Act No.16 of 2013)	National	The Act makes provisions regarding developing a new framework to govern planning permissions and approvals, sets parameters for new developments and provides for different lawful land uses in South Africa.	A change in land use is required as the area is currently zoned agriculture and needs to be rezoned to industrial. The rezoning application will be conducted with the Local municipality.
Civil Aviation	Civil Aviation Act 13 of 2009	As outlined in Part 139.01.30 of the Civil Aviation Regulations (GN R425, GG 35398 of 1 June 2012), Buildings or other objects which will constitute an obstruction or potential hazard to aircraft moving in the navigable air space in the vicinity of an aerodrome, or navigation aid, or which will adversely affect the performance of the radio navigation or instrument landing systems, must not be erected or allowed to come into existence without the prior approval of the Director.	The screening report rated civil aviation high. However, a detailed mapping assessment confirmed that the proposed power plant location is within the low sensitivity of civil aviation aerodromes.
Defence	Defence Act 42 of 2002	The Defence Act 42 of 2002 is a comprehensive piece of legislation in South Africa that governs various aspects related to national defence, military organisation, and security matters.	The screening tool assessed the proposed site as having low sensitivity to Defence concerns. Therefore, according to protocols

Legislation	Administering Authority:	Summary	Applicability
			for Specialist (GN.320) of March 2020, there are no anticipated adverse impacts on defence. Moreover, GIS mapping confirmed that the proposed project is located within a low-sensitivity area.
Development Facilitation Act (Act 67 of 1995)	National	The Development Facilitation Act (Act 67 of 1995) (DFA) sets out several key planning principles that have a bearing on assessing proposed developments, considering the national planning requirements. The planning principles most applicable to the study area include: • Promoting the integration of the social, economic, institutional, and physical aspects of land development; • Promoting integrated land development in rural and urban areas in support of each other; • Promoting the availability of residential and employment opportunities near or integrated; • Optimising the use of existing resources including such resources relating to agriculture, land, minerals, bulk infrastructure, roads, transportation, and social facilities; • Contributing to the correction of the historically distorted spatial patterns of settlement in the Republic and the optimum use of existing infrastructure more than current needs; • Promoting the establishment of viable communities; and	Applies to all developments.

Legislation	Administering Authority:	Summary	Applicability
		• Promoting sustained protection of the environment.	
Mineral And Petroleum Resources Development Act of 2002.	National	Section 53 of the Act administers the use of land surface rights contrary to the objects of the Act. (1) Subject to subsection (2), any person who intends to use the surface of any land in any way which may be contrary to any object of this Act or which is likely to impede any such object must apply to the Minister for approval in the prescribed manner. The requisite application will be submitted.	The Section 53 application is in progress.
OTHER National Protected Areas Expansion Strategy (NPAES) Environmental Conservation Act (Act No. 73 of 1983) Natural Scientific Professions Act (Act No. 27 of 2003) National Forest Act (Act No. 84 of 1998) National Veld and Forest Fire Act (101 of 1998) National Protected Areas Expansion Strategy (NPAES) Civil Aviation Act (Act 13 of 2009) and Civil Aviation Regulations (CAR) of 1997 Civil Aviation Authority Act (Act 40 of 1998) The Civil Aviation Act No. 13 of 2009 Draft White Paper on Civil Aviation Policy, 2017 ICAO Annex 14, Volume 1: Aerodrome Design and Operations (see Appendix 6.4 & 6.5) SA Civil Aviation Regulations (CARS): Part 139 – Aerodromes and Heliports			

Legislation	Administering Authority:	Summary	Applicability
SA Civil Aviation Technical Standards (CATS): SACATS 139.01.30 (26th Amendment) – Obstacle Limitations and Markings Outside Aerodromes or Heliports (Appendix 6.2) **PROVINCIAL** Mpumalanga Nature Conservation Ordinance (Ordinance 8 of 1969) **MUNICIPAL** Municipal Systems Act (Act No. 32 of 2000) Municipal By-laws as applicable to the project area Laws identified in the respective specialist reports **INTERNATIONAL** International Finance Corporation Performance Standards Equator Principles International Convention on Biological Diversity (CBD, 1993) The Convention on Wetlands (RAMSAR Convention, 1971) The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 1973) The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention, 1979) The United Nations Framework Convention on Climate Change (UNFCC,1994)			

6.2 POLICIES AND GUIDELINES

The following Guideline documents were considered in the preparation of this report:

- Department of Environmental Affairs (DEA) Integrated Environmental Management Guideline Series 7, Public Participation in the EIA Process as published in Government Gazette No. 33308, 18 June 2010;
- Implementation Guidelines (published for comment) in Government Notice 603 of 2010;
- Integrated Environmental Management Information Series (Booklets 0 to 23) (DEAT, 2002 – 2005);
- Energy Efficiency Strategy of the Republic of South Africa (Department of Minerals and Energy (DME) now operating as Department of Mineral Resources (DMR), March 2005);
- White Paper on Renewable Energy (2003); and
- Integrated Resource Plan for South Africa (2010).
- Climate Change Policy

6.3 PROVINCIAL AND MUNICIPAL PLANS

The ESIA considers the provincial and municipal plans and the project's relevance and alignment with the existing plans as detailed in the motivation (Section 7)

Table 13: Provincial and Municipal Plan

Plan	Description
Mpumalanga Provincial Growth and Development Strategy (2003), which is part of the Mpumalanga Vision 2030 Strategic Implementation Framework	The Mpumalanga Provincial Growth and Development Strategy (PGDS) is a comprehensive framework to guide the province's socioeconomic development. It aligns with the broader national objectives and focuses on several key areas: Economic Growth and Employment: Promoting sustainable economic growth and creating job opportunities. **Education and Innovation**: Improving education systems and fostering innovation. **Healthcare**: Ensuring accessible healthcare for all residents. Social Protection: Providing social safety nets to protect vulnerable populations. Infrastructure Development: Building and maintaining economic infrastructure. Environmental Sustainability: Promoting sustainable environmental practices. Rural Development: Enhancing the rural economy and improving living conditions in rural areas. **Governance**: Building a capable and developmental state and fighting corruption. This strategy is part of the Mpumalanga Vision 2030, which aims to transform the province into a more inclusive and prosperous region by 2030. Vision 2030 clearly and concisely captures the broader drivers of change globally and globally. In this respect, it

Plan	Description
	correctly identifies the implications of the global and regional trends on development and the parameters within which development will unfold. Vision 2030 is driven by a belief that South Africa could create 11 million jobs by 2030 through, among others, building partnerships between the public sector, business, and labour to facilitate, direct and promote investment in labour-intensive areas. **The proposed project is anticipated to contribute to the plan as it will create up to 5175 direct and indirect jobs during the construction and operational phases. Induced employment created during the construction and operational phases will be 5400 and 810, respectively**. As part of the fundamental mechanisms, the plan highlights efforts to focus on economic infrastructure, which includes energy, electricity, water and broadband. The plan encourages a shift towards renewable energy sources, recognising the limits of electricity that rely on dwindling coal reserves. The current reliance on coal for energy means an adequate supply of electricity and liquid fuel is a concern. Waterberg will be developed as an alternative coal supply region. There is a need to balance domestic coal supply with export growth and find alternative sustainable renewable energy resources, such as gas. Another mechanism identified includes environmental sustainability and resilience, noting that climate change has a marked impact on South Africa. Furthermore, climate change is identified as one of the key drivers of change. It highlights that in responding to these changes, industries and households will have to reduce their negative impact on the environment. Corresponding policies applicable at the provincial level to reduce carbon emissions include electricity from renewables such as biofuels and improving energy efficiency via incentives.
Mpumalanga Industrial Development Plan (2016)	The Mpumalanga Industrial Development Plan is an integrative approach to industrialisation in the province within the context of a broad policy and planning framework that covers all spheres of Government. At the core of the provincial strategic and planning framework is the Mpumalanga Economic Growth and Development Path, which indicates a clear commitment by the provincial government towards industrialisation through enabling infrastructure development and resource allocation. The plan aims to achieve short- and long-term goals of Developing inter-sectoral linkages that will localise the supply chains within the province, especially with major companies in the mining and energy sectors; Planned efforts to distribute development investments over a range of industries to prioritise job creation; and expanding sustainable and value-adding employment opportunities.

Plan	Description
Gert Sibande District Municipality Local Economic Development Strategy	The vision for the GSDM LED Strategy is to promote long-term sustainable growth within the GSDM through job creation, the eradication of poverty and unemployment, meeting the socio-economic needs of the community, and diversification of the economic base. One of the sectors driving the economy in the district is Energy generation. The district has four out of 10 operational coal-fired power stations in Mpumalanga, namely, Tutuka, Camden, Majuba and Grootvlei. As such, coal-fired power generation is a major industry in Gert Sibande, and these power stations are located near the coal mines due to the high cost associated with the transportation of coal. The Majuba Rail Network was commissioned to ease the pressure placed on the existing road infrastructure between Ermelo and Amersfoort by the truck transporting coal to Majuba Power Station. Amongst the NDP targets are energy and electricity-related targets that include: • The proportion of people with access to the electricity grid should rise to at least 90% by 2030; and • The country would need an additional 29 000MW of electricity by 2030, of which at least 20 000MW of this capacity should come from renewable sources. In line with National Outcome 6, which focuses on an efficient, competitive and responsive economic infrastructure network with the following outputs, the output includes: • Output 1: Improving competition and regulation • Output 2: Ensure reliable generation, distribution and transmission of electricity.
Pixley Ka Seme Local Municipality	The mining and energy sectors are key to the municipality's economic growth. The Majuba Power Station is located within the municipal area, and several mines are also in the municipality. The municipality has recognised that climate change is one of the most critical issues currently occupying governments throughout the globe, citing that the impact of highly unpredictable climate change has reached unparalleled levels. To address the issue of climate change in regard to infrastructure provision, the introduction of “green Infrastructure” must be implemented and adopted in frameworks and development plans. Currently, South Africa is facing a major electricity backlog as Eskom is in debt and is correctly using emergency reserves to address the issue of load shedding. Electrical demand will only be met through the national grid or self-governing renewable energy sources like solar energy that will be sustainable and address climate change.

Plan	Description
	Even though there is a reduction in terms of solar energy usage as a form of generating electricity, it is evident that this technology is projected to be even cheaper than traditional coal and natural gas-charged electricity generation.

Table 14: Mpumalanga Strategic Initiatives and alignment with the project

Strategic Initiative	Alignment with Renewstable®Qhakaza
Mpumalanga Vision 2030	
Economic Diversification	The project contributes to economic diversification in Mpumalanga by introducing industrial activities in the energy sector and reducing reliance on agriculture and mining.
Infrastructure Development	Enhances the province's energy infrastructure, providing a reliable power supply crucial for sustaining industrial activities and supporting economic growth.
Job Creation and Social Development	It creates significant employment opportunities during the construction and operational phases, reducing unemployment and poverty, particularly in rural areas like Malelane.
National Development Plan (NDP) 2030	
Energy Security	Contributes up to 34MW of renewable energy to the national grid, enhancing South Africa's energy security and reducing the risk of power shortages.
Environmental Sustainability	Supports the transition to a low-carbon economy by using solar, a cleaner alternative to coal, and commits to comprehensive environmental management practices.
Economic Growth and Job Creation	Promotes inclusive economic growth and job creation, aligning with NDP's objectives to reduce poverty and inequality by stimulating local economies and industrial development.
New Growth Path	
Industrial Development	It supports industrial development by building a modern energy infrastructure that powers industrial activities, enhancing South Africa's industrial capacity and competitiveness.
Job Creation and Skills Development	Generates direct and indirect employment opportunities and provides training and skills development for the local workforce, supporting national job creation and upskilling goals.
Industrial Policy Action Plan (IPAP)	
Industrial Development	The project contributes to the IPAP's focus on enhancing South Africa's industrial capacity, particularly in the energy sector, which is crucial for national economic expansion.
Economic Growth and Competitiveness	The Renewstable® Qhakaza project's infrastructure and industrial contributions align with IPAP's goals of boosting South Africa's global competitiveness and economic growth.

6.4 OVERVIEW OF RELEVANT INTERNATIONAL STANDARD

6.4.1 INTERNATIONAL FINANCE CORPORATION PERFORMANCE STANDARDS

The IFC Sustainability Framework articulates the IFC's strategic commitment to sustainable development and is an integral part of the IFC's approach to risk management. The Framework incorporates the IFC's Policy, Performance Standards, and Access to Information Policy. Alongside the Performance Standards is a companion set of Guidance Notes, guiding clients in meeting them. The Framework was adopted in 2006 and updated in 2012 following an 18-month consultation with stakeholders worldwide.

The Performance Standards are directed towards clients, guiding the identification of risks and impacts. They are designed to help avoid, mitigate, and manage risks and consequences as a way of doing business sustainably. These include stakeholder engagement and disclosure obligations of the client concerning project-level activities." IFC Performance Standards 2012."

The proposed project will incorporate the International Finance Corporation (IFC) 's environmental and social policies to promote responsible environmental stewardship and socially responsible development. These policies provide a frame of reference for lending institutions to review projects' environmental and social risks, particularly those undertaken in developing countries.

Through the Equator Principles, the IFC's standards are now recognised as international best practices in project finance. The IFC screening process categorises projects into A, B, or C to indicate relative environmental and social risk degrees. The categories are:

- Category A Projects expected to have significant adverse social and/or environmental impacts that are diverse, irreversible, or unprecedented;
- Category B Projects expected to have limited adverse social and/or environmental impacts that can be readily addressed through mitigation measures; and
- Category C Projects expected to have minimal or no adverse impacts, including specific financial intermediary projects.

The proposed project is categorised as a Category B project; hence, the EIA Process to assess the project's potential negative and positive environmental impacts. The International Finance Corporation (IFC) has adopted eight (8) Performance Standards (PS) on Social and Environmental Sustainability to manage social and environmental risks and impacts and to enhance development opportunities.

Table 15: IFC Performance Standards

Performance Standard	Summary	Applicability
IFC – PS 1	**Assessment and Management of Environmental and Social Risks and Impacts** Assessment and Management of Environmental and Social Risks and Impacts Performance Standard PS 1 applies to all projects with environmental and social risks and impacts. It underscores the importance of managing environmental and social performance throughout the life of a project and establishes the importance of: i. Integrated assessment to identify the environmental and social impacts, risks, and opportunities of projects; ii. Effective community engagement through disclosure of project-related information and consultation with local communities on matters that directly affect them; and iii. The client's management of environmental and social performance throughout the life of the project.	The development and operation of the proposed project present risks to the social and biophysical environments. As a result, undertaking an EIA is critical to complying with this PS.
IFC – PS 2 Labour and Working Conditions	Performance Standard PS 2 acknowledges that the pursuit of economic growth through employment creation and income generation should be accompanied by protecting workers' fundamental rights. The requirements set out in PS 2 have been partly guided by several international conventions and instruments, including those of the International Labour Organization (ILO) and the United Nations (UN). To promote fair treatment, non-discrimination, and equal opportunity for workers. • To establish, maintain and improve the worker-management relationship. • To promote compliance with national employment and labour laws.	Both skilled and unskilled workers will be employed, particularly during the construction phase of the Project, thus triggering this PS.

Performance Standard	Summary	Applicability
	• To protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the client's supply chain. • To promote safe and healthy working conditions and the health of workers. To avoid the use of forced labour.	
IFC – PS 3 Resource Efficiency and Pollution Prevention	Performance Standard PS 3 recognizes that increased economic activity and urbanization often generate increased levels of pollution in air, water, and land and consume finite resources in a manner that may threaten people and the environment at the local, regional, and global levels. There is also a growing global consensus that the current and projected atmospheric concentration of GHG threatens the public health and welfare of current and future generations. PS 3 outlines a project-level approach to resource efficiency, pollution prevention, and control in line with internationally disseminated technologies and practices. In addition, it promotes the ability of private sector companies to adopt such technologies and practices as far as their use is feasible in the context of a project that relies on commercially available skills and resources. The objectives of PS 3 are: • To avoid or minimise adverse impacts on human health and the environment by preventing or minimising pollution from project activities. • To promote more sustainable use of resources, including energy and water. • To reduce Project-related GHG emissions. This standard has potential relevance to the project scope.	This standard has potential relevance to the project scope during the construction and operational phases.

Performance Standard	Summary	Applicability
IFC – PS 4 Community Health, Safety, and Security	Performance Standard 4 recognises that project activities, equipment, and infrastructure can increase community exposure to risks and impacts. While acknowledging the public authorities' role in promoting the health, safety, and security of the public, PS 4 addresses the client's responsibility to avoid or minimise the risks and impacts to community health, safety, and security that may arise from project-related activities, with particular attention to vulnerable groups. The objectives of PS 4 are: • To anticipate and avoid adverse impacts on the health and safety of the affected community during the project life from routine and nonroutine circumstances. • To ensure that personnel and property are safeguarded in accordance with relevant human rights principles and in a manner that avoids or minimises risks to the affected communities.	Community health, safety and security risks are assessed as part of the ESIA. This will remain applicable throughout the project.
IFC – PS 5 Land Acquisition and Involuntary Resettlement	Performance Standard 5 recognises that project-related land acquisition and land use restrictions can adversely impact communities and persons that use this land. Involuntary resettlement refers to physical displacement (relocation or loss of shelter) and economic displacement (loss of assets or access to assets that leads to loss of income sources or other means of livelihood) due to project-related land acquisition and/ or restrictions on land use. The objectives of PS 5 are: • To avoid, and when avoidance is not possible, minimise displacement by exploring alternative project designs. • To avoid forced eviction. • To anticipate and avoid, or where avoidance is not possible, minimise adverse social and economic impacts from land acquisition or restrictions on land use by: i. providing compensation for loss of assets at replacement cost; and	The property identified for the development of the Renewstable® Qhakaza Project has been negotiated through the Eskom Land lease program. The development thereof will not prejudice any residents as the site is unoccupied. No land acquisition or resettlement is required, and, as a result, compliance with PS 5 is not required.

Performance Standard	Summary	Applicability
	ii. ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation, and the informed participation of those affected. • To improve, or restore, the livelihoods and standards of living of displaced persons • To improve living conditions among physically displaced persons through the provision of adequate housing with security of tenure at resettlement sites.	
IFC – PS 6 Biodiversity Conservation and Sustainable Management of Living Natural Resources	Performance Standard 6 recognises that protecting and conserving biodiversity, maintaining ecosystem services, and managing living natural resources are fundamental to sustainable development. The Convention on Biological Diversity has guided the requirements set out in PS 6. The objectives of PS 6 are: • To protect and conserve biodiversity. • To maintain the benefits of ecosystem services. • To promote the sustainable management of living natural resources by adopting practices that integrate conservation needs and development priorities.	The site is predominantly agricultural. Despite providing limited habitat for terrestrial and aquatic fauna and flora, a biodiversity assessment and separate avifauna assessment have been included in the ESIA. Furthermore, specialists have been commissioned to provide input, and the outcomes of their studies have been incorporated and will be further detailed in the ESIA.
IFC – PS 7 Indigenous Peoples	Performance Standard 7 recognises that Indigenous Peoples, as social groups with identities that are distinct from mainstream groups in national societies, are often among the most marginalised and vulnerable segments of the population. In many cases, their economic, social, and legal status limits their capacity to defend their rights to, and interests in, lands and natural and cultural resources and may restrict their ability to participate in and benefit from development. The objectives of PS 7 are:	No risks to indigenous people have been identified. This PS is not applicable.

Performance Standard	Summary	Applicability
	• To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of Indigenous Peoples. • To anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimize and/or compensate for such impacts. • To promote sustainable development benefits and opportunities for Indigenous Peoples in a culturally appropriate manner. • To establish and maintain an ongoing relationship based on Informed Consultation and Participation (ICP) with the Indigenous Peoples affected by a project throughout the project's life cycle. • To ensure the Free, Prior, and Informed Consent (FPIC) of the Affected Communities of Indigenous Peoples when the circumstances described in this Performance Standard are present. • To respect and preserve the culture, knowledge, and practices of Indigenous Peoples.	
IFC – PS 8 Cultural Heritage	Performance Standard 8 recognises the importance of cultural heritage for current and future generations. Consistent with the Convention Concerning the Protection of the World Cultural and Natural Heritage, PS 8 aims to ensure that clients protect cultural heritage during project activities. In addition, the requirements of this PS on a project's use of cultural heritage are based in part on standards set by the Convention on Biological Diversity. The objectives of PS 8 are:	Earthworks and construction activities could pose a risk to cultural heritage. This Performance Standard is triggered.

Performance Standard	Summary	Applicability
	• To protect cultural heritage from the adverse impacts of project activities and support its preservation. • To promote the equitable sharing of benefits from the use of cultural heritage.	

6.4.2 IFC ENVIRONMENTAL HEALTH AND SAFETY GUIDELINES

World Bank Group Environmental, Health, and Safety Guidelines (known as the "EHS Guidelines") are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). The EHS Guidelines are technical reference documents with general and industry-specific examples of GIIP. They are referred to in the World Bank's Environmental and Social Framework and IFC's Performance Standards. The World Bank Group requires borrowers/clients to apply the relevant levels or measures of the EHS Guidelines. When host country regulations differ from the levels and measures presented in the EHS Guidelines, projects will be required to achieve whichever is more stringent. The EHS Guidelines applicable to this project include the General EHS Guidelines, 2007: The EHS Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs (some of the monitoring aspects will not apply to the construction phase of the Project).

6.4.3 THE EQUATOR PRINCIPLES

The Equator Principles are a risk management framework that financial institutions adopt for determining, assessing, and managing environmental and social risk in projects. They primarily aim to provide a minimum standard for due diligence to support responsible risk decision-making. Equator Principles Financial Institutions (EPFIs) commit to implementing the Equator Principles in their internal environmental and social policies, procedures, and standards for financing projects and will not provide Project Finance or Project-Related Corporate Loans to projects where the client will not or is unable to, comply with the Equator Principles. Potential borrowing organisations need to consider the Equator Principles and environmental and social risk management as part of the EIA process to facilitate potential access to funding for project development. There are 10 principles, as shown below, and these require that projects conduct an EIA process in compliance with the IFC Performance Standards on Environmental and Social Sustainability; hence, there is a need for this ESIA process. Table 16 describes the applicable principles.

Table 16: The equator principles

Principles
1. **Review and categorisation** Establishes the need for the EPFI to categorise the project based on the magnitude of its potential environmental and social risks and impacts as part of its internal environmental and social review and due diligence.
2. **Social And Environmental Assessment** It requires the client to conduct an assessment process to address, to the EPFI's satisfaction, the relevant environmental and social risks and impacts of a proposed project. The assessment documentation must

	propose measures to minimise, mitigate, and offset adverse impacts in a manner relevant and appropriate to the nature and scale of the proposed project.
3.	**Applicable environmental and social standards** Established that the Assessment process should first address compliance with relevant host country laws, regulations, and permits that pertain to environmental and social issues.
4.	**Environmental and Social Management System and Equator Principles Action Plan** The client must prepare an Environmental and Social Management Plan (ESMP) to address issues raised in the assessment process and incorporate actions required to comply with the applicable standards.
5.	**. Stakeholder engagement** Requires clients to demonstrate effective Stakeholder Engagement as an ongoing process in a structured and culturally appropriate manner with affected communities and, where relevant, other stakeholders
6.	**Grievance mechanism** This requirement requires the client to establish a grievance mechanism as part of the ESMS designed to receive and facilitate the resolution of concerns and grievances about the Project's environmental and social performance.
7.	**Independent review** Requires that an Independent Environmental and Social Consultant, not directly associated with the client, will independently review the assessment documentation, including EMPs process documentation, to assist the EPFI's due diligence and assess Equator Principles compliance.
8.	**Covenants** The financing documentation requires that the client pledge to comply with all relevant host country environmental and social laws, regulations, and permits in all material respects.
9.	**Independent monitoring and reporting** Requires the appointment of an Independent Environmental and Social Consultant or requires that the client retain qualified and experienced external experts to verify its compliance with the Equator Principles and monitor information that would be shared with the EPFI.
10.	**Reporting and transparency** Entails the client's reporting requirements and the disclosure requirements in Principle 5. This principle states that the client will ensure that, at a minimum, a summary of the EIA is accessible and available online and the client will publicly report GHG emission levels (combined Scope 1 and Scope 2 Emissions) during the operational phase for Projects emitting over 100 000 tonnes of CO2 equivalent annually.

6.4.4 INTERNATIONAL CONVENTIONS

South Africa is a party to the majority of international conventions. It has a vital role to play in international environmental law because of its position as one of the strongest African countries. This Section outlines the environmental conventions to which South Africa is a party. Such Conventions include:

- Framework Convention on Climate Change, 1992;
- Convention on Biological Diversity, 1992;
- The Convention on International Trade in Endangered Species (CITES) of 1973;
- Convention to Combat Desertification 1994;
- National Rangeland Management Policy and Strategy of 2012;
- National Biodiversity Strategy and Action Plan 1 and 2 (draft);
- Vienna Convention for the protection of the ozone layer (1985);
- Montreal Protocol on substances that deplete the ozone layer (1987);
- United Nations Convention on Biological Diversity (UNCBD); and
- United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) 2007.

7 DESCRIPTION OF THE NEED AND DESIRABILITY OF THE PROPOSED ACTIVITY

This section justifies the need and desirability of the proposed development, focusing on its associated benefits and importance to the locals and the region.

7.1 MOTIVATION FOR THE DEVELOPMENT

The outbreak of the COVID-19 pandemic in March 2020 found a vulnerable South African economy and deepened the existing economic crises. In 2019, before the pandemic and lockdown, the national economy expanded by only 0.3%, and the provincial economy contracted by 0.4%. The pandemic and lockdown intensified the province's and country's economic challenges (www.parliament.gov.za). Subsequently, on 15 October 2020, President Ramaphosa detailed the Economic Reconstruction and Recovery Plan (ERRP) to build a new economy and reignite and unleash South Africa's true potential. The overarching goal of the plan is to create a sustainable, resilient, and inclusive economy that focuses on the following priority areas:

- Energy security.
- Industrial base to create jobs.
- Mass public employment programme.
- Infrastructure development.
- Macroeconomic interventions.
- Green economy.
- Food security.
- Reviving the tourism sector.

Following the pronouncement of the ERPP, the Mpumalanga Provincial Government adopted the ERRP and referred to it as the Mpumalanga MERRP, which was finally launched in October 2021. The strategic objective of the MERRP is not only to mitigate the negative impact of the COVID-19 pandemic on the economy and livelihoods but also to place the provincial economy on a growth trajectory that creates more job opportunities for the people of Mpumalanga. The plan proposes several interventions, including rolling out massive economic infrastructure to revive the economy and create jobs. The proposed Renewstable Mpumalanga project aligns with this strategy as it provides reliable electricity, enhancing and stimulating growth.

A primary hindrance to the growth of the South African economy in recent years has been the electricity crisis, which exposed the country to load shedding. This has negatively impacted the country's economy, industrial output, and the daily lives of its citizens. South Africa's load-shedding crisis is caused by a combination of factors, and resolving it is a complex challenge that requires multifaceted solutions.

In support of solutions and initiatives to curb the country's energy crisis, Eskom's Land Lease Programme was launched in April 2022. Through this program, Eskom makes some of its lands available to IPPs to create new electricity-generating capacity. These land parcels are near network connection points, reducing the time required to build new grid connection infrastructure. As opposed to buying electricity from the IPPs, Eskom facilitates a process for the IPPs to wheel the power over the Eskom grid, either for their consumption or to sell to other consumers. Eskom, thus, called upon the private sector to enable new capacity in line with the anticipated future deregulated electricity industry.

In April 2022, Eskom issued an RFP, as part of the first phase of the Land Leasing Project, for leasing 17 land parcels in Mpumalanga province around the Majuba and Tutuka Power Stations. In October 2022, Eskom concluded lease agreements with five IPPs to develop an estimated 1,800MW of new generation capacity. HDF-Energy is part of a cluster made up of different project developers, also awarded land in the area for the development of infrastructure related to renewable energy production.

Against this backdrop, HDF-Energy plans to expand its footprint into the well-suited region of Mpumalanga Province in South Africa to address the shortage of electricity generation capacity. HDF-ENERGY, under its Special Purpose Company (SPC) "Renewstable Mpumalanga (Pty) Ltd," is undertaking the development and implementation of 4 projects in the Majuba Area, including the proposed Renewstable® Qhakaza. The electricity produced by the plants will be purchased by a private(s) off-taker (s) at an agreed rate under a Power Purchase Agreement (PPA) for at least 25 years from the commissioning of the plant. It will contribute to the greening of the local power grid and enhance the territory's energy independence.

7.2 BENEFITS OF THE PROJECT

The desirability of implementing a Photovoltaic (PV) plant coupled with hydrogen storage in South Africa's Mpumalanga Province is undeniable. This innovative energy solution aligns perfectly with the region's abundant solar resources and growing energy demands. Mpumalanga experiences ample sunlight throughout the year, making PV generation highly efficient. By incorporating hydrogen storage, excess solar energy can be stored and used during periods of low sunlight, ensuring a stable and reliable power supply. Moreover, this project will contribute significantly to South Africa's transition to clean and sustainable energy, reduce greenhouse gas emissions, create job opportunities, and enhance energy security. It's a compelling endeavour that addresses immediate energy needs and sets the stage for a greener and more prosperous future in South Africa.

Further, the project is expected to play a central role in supporting Africa's drive to achieve electricity connection for nearly 3 million people without access to electricity, as estimated by the South African National Energy Development Institute *SANEDI), to reduce widespread reliance on coal for power generation, and to fast-track the continent's slowed industrial expansion.

Consequently, this project aims to respond to the government initiative driven by the need to diversify the country's energy sources and create a balanced and more sustainable energy mix. The proposed project will ensure the following:

Energy diversification: South Africa's electricity market is dominated by coal power plants. The past decade has seen the introduction of renewable energy initiatives, such as wind and solar power and battery energy storage technologies. The proposed new hydrogen-to-power technology is expected to add value and enhance the country's energy mix by reducing reliance on coal.

Enhance Grid services: Therefore, the Renewstable® Qhakaza and similar ones in the area are hallmark power projects for South Africa. The proposed hydrogen-to-power will be one of the first in the country to provide essential services to the national grid currently provided by Eskom. These services include (design to be adjusted based on the needs):

- Power flexibility (on-demand dispatchable energy);
- Load following morning and evening peak response;
- Scheduling and short-term adjustment (energy imbalance);
- Excess energy storing;
- System protection and grid support (frequency control);
- Reactive power (voltage control);
- System restoration; and
- Long-term storage and backup capability (operating reserves, loss compensation, energy imbalance.

Economic stimulus for the region and country: The project forms part of the Majuba cluster near the Eskom Majuba Power Station. The Renewstable Mpumalanga Social Development Plan will clearly outline how the socio-economic development will be rolled out, impacting skills transfer, training, employment, and local empowerment. The project will enlist unskilled, semi-skilled, and skilled individuals through a predetermined process that may lead to employment, skilling, or upskilling to be determined via the Renewstable Mpumalanga Impact Programme. This programme will be focused on gender and youth inclusivity. Small to Medium Enterprises (SMEs) will equally be prioritised through a vetting process where eligible candidates will form part of a list of potential subcontractors to which the appointed Engineering, Procurement, and Construction (EPC) company will be contractually bound. Additionally, training, exposure, and skills sharing on Namibia's technology and emerging green hydrogen economy will be rolled out nationally through partnerships with educational institutions at all levels to ensure the localisation of GH2-related skills.

Job Creation: The proposed project is expected to create a significant number of jobs, with up to 570 and 60 direct and indirect jobs during the construction and operational phases, respectively. The combined Majuba cluster will further boost employment, potentially creating up to 5170 jobs. This substantial job creation will positively impact the local community and economy.**Foreign direct Investments:** This is a foreign direct investment whose infrastructural development will directly increase economic growth.

Aid South Africa's Transition to a Low Carbon Economy: While the aim is to reduce emissions immediately and provide relief for those already affected by environmental impacts, meaningful work is simultaneously needed to lay the groundwork for future emission reduction and climate resilience through investments in low-carbon and climate-

resilient infrastructure. Seemingly, the proposed Renewstable® Qhakaza project will contribute to this transition. Projects of this calibre contribute to South Africa attaining its Vision 2030 commitments.

Developing these projects, particularly in the Mpumalanga Province, is also an opportunity to offset the job losses caused by the decommissioning of Eskom's coal fleet. This project's implementation will positively impact the local economy through job creation opportunities directly or indirectly related to the power plant construction and operations. From this project, there will be opportunities for local people to be trained to operate and maintain the power plant, along with many supporting service opportunities being created.

The project will play an important role in helping South Africa with its 'Just Energy Transition' (JET) objectives by allowing for a reliable transition from coal towards a more sustainable energy future while accommodating and supporting the country's socio-economic development needs. In addition to the above, the rationale of the proposed project responds to the national climate change agenda, which calls for efforts to build climate change resilience and advance low-carbon development pathways within the context of sustainable development through, amongst others, developing renewable energy sources and increasing energy efficiency. C

7.3 SUPPORTING STRATEGIES

At the regional level, the project would improve the socioeconomic status of the adjacent communities and the region at large. At the national level, the project would contribute to implementing South Africa's new energy policy as embodied in the White Paper on Energy (Department of Minerals and Energy, 1998), which highlights that, amongst others, coal plays a central role in the socioeconomic development of our country, while simultaneously providing the necessary infrastructural economic base for the country to become an attractive host for foreign investments in the energy sector. The priorities to which this project would contribute are laying the groundwork for enhancing a cleaner energy supply. Several national policy documents, including the White Paper on the Energy Policy of South Africa, approved in 1998; the National Development Plan ("NDP"); the draft Integrated Energy Plan; and the Integrated Resources Plan 2010–2030 present the case for natural gas as a significant contributor to South Africa's energy mix.

It must be noted that this project forms part of the Eskom land lease program, which aims to make Eskom land available close to the power stations, where there is sufficient grid capacity, which is an innovative step taken by Eskom to find the quickest way possible and within their scope of influence to boost the country's generation capacity. The key objective of the initiative is to provide relief to the constrained electricity system in as short a time as possible, as there is a dire need to alleviate pressure on the system by adding as many megawatts as possible in the shortest possible time, thus increasing Eskom's ability to conduct maintenance at its existing fleet, reducing load shedding and the usage of open cycle gas turbines (OCGTs). Being the first of its kind in the country, the program will accelerate the connection of additional capacity to the nation, thus improving supply reliability. Furthermore, the land leases will attract an estimated investment of approximately R40 billion to areas traditionally associated with coal-fired electricity generation, which makes this a compelling proof point for the just energy transition to a lower carbon economy.

8 A FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED ACTIVITY AND LOCATION OF THE DEVELOPMENT FOOTPRINT WITHIN THE SITE

According to the EIA Regulations published in Government Notice (GN) R982 of 2014, as amended, feasible and reasonable alternatives must be identified and considered within the Scoping and Environmental Impact Assessment and will be assessed in greater detail during the EIA Phase, as per Appendix 2 and Appendix 3, respectively

South Africa has proposed a 20-year Integrated Resource Plan (IRP) outlining a new power generation program for 2030. The program will use various renewable energy technologies to generate electricity. As indicated above, in response to the President's call for "an ambitious, bold and urgent response to the energy crisis", Eskom signed lease agreements with four independent power producer investors for the commercial lease and use of land parcels at two of its power stations in Mpumalanga province for the construction of new clean energy generation capacity in October 2022. This was the first batch of lease agreements to be signed with private companies that comprised land parcels around the Majuba and Tutuka power stations. Schedule 2 of the Electricity Regulation Act of 2006, as gazetted by the Department of Mineral Resources and Energy in August 2021, permits independent power generators to wheel electricity through the transmission grid, subject to wheeling charges and connection agreements with the relevant transmission or distribution licence holders.

As part of the feasibility, Eskom undertook a comprehensive screening of the land parcels for useability, considering accessibility, areas above underground mines, future mining activities, the conservation of environmentally sensitive areas such as wetlands and heritage sites, and the sloping of the land parcels, implying that only suitable parcels formed part of the land lease tender. It must be noted that the available land is around its power stations and other sites with sufficient grid capacity to connect renewable energy producers. All the above culminated in selecting suitable land parcels that would be earmarked for projects similar project. It is against this backdrop that these sites were selected.

Consequently, the ESIA process will only consider the land parcels awarded, implying that no alternative location will be considered. However, the process will, among other alternatives, consider various layouts that are most suitable from an environmental and social point of view. The figure below presents the proposed site for Renewstable® Qhakaza.

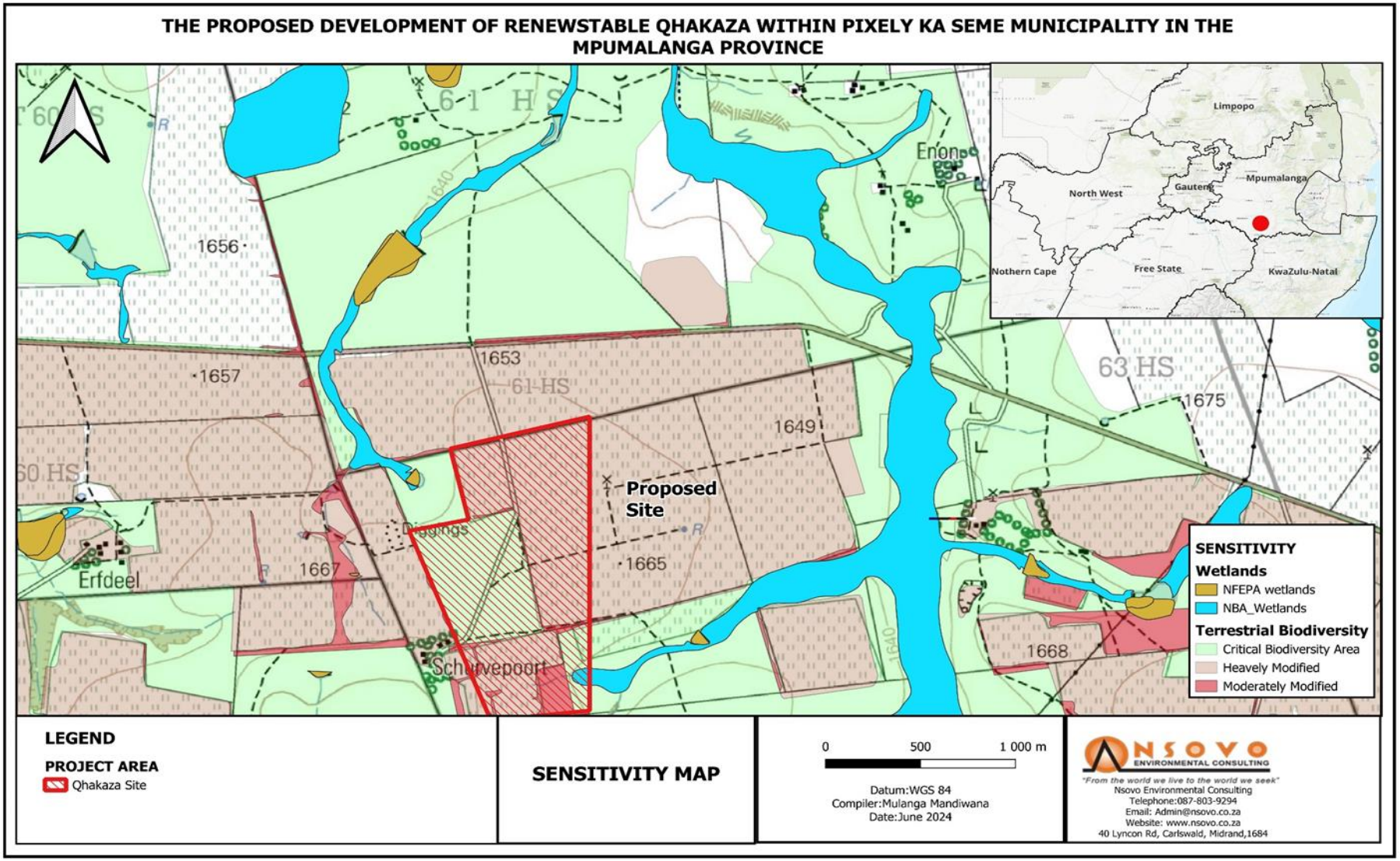


Figure 10: A sensitivity map of the area earmarked for the proposed development

According to GN R 982 of the EIA Regulations (2014), an alternative is defined as *"…in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to the:*

a) property on which or location where it is proposed to undertake the activity;
b) type of activity to be undertaken;
c) design or layout of the activity;
d) technology to be used in the activity;
e) operational aspects of the activity; and
f) Includes the option of not implementing the activity."

The various alternatives have been assessed in terms of both environmental acceptability as well as economic feasibility. The selection of the preferred alternative is based on several factors:

- Public input, ascertained through the PPP;
- Specialists' recommendations;
- Environmental constraints;
- Technical feasibility;
- Economic cost-benefit analysis;
- Best practicable environmental option, i.e., the option that provides the most benefit or causes the least damage to the environment at a cost acceptable to society in both the long and short term; and
- Optimisation of existing infrastructure, such as access roads.

The purpose of alternatives, as defined in the Department of Environmental Affairs and Tourism's (now DFFE) 2004 Integrated Environmental Information Series on the Criteria for determining alternatives in EIA, is to find the most effective way of meeting the need and purpose of the proposal, either through enhancing the environmental benefits of the proposed activity or through reducing or avoiding potentially significant negative impacts.

In terms of Section 24 of NEMA, the proponent must demonstrate that alternatives have been described and investigated in sufficient detail during the EIA process. It is important to highlight that alternatives must be practical, feasible, reasonable, and viable to cater for an unbiased approach to the project and, in turn, to ensure environmental protection. The role of alternatives is to find the most effective way of meeting the need and purpose of the proposal, either through enhancing the environmental benefits of the proposed activity or through reducing or avoiding potentially significant negative impacts.

To ensure full disclosure of alternative activities, various role players must contribute to their identification and evaluation. Stakeholders have an important contribution to make during the EIA Process, and each role is detailed as follows:

The role of the environmental practitioner is to:

- encourage the proponent to consider all feasible alternatives;
- provide opportunities for stakeholder input to the identification and evaluation of alternatives;
- document the process of identification and selection of alternatives;
- provide a comprehensive consideration of the impacts of each of the alternatives; and
- document the process of evaluation of alternatives.

The role of the proponent is to:

- disclose all information relevant to the identification and evaluation of alternatives;
- assist in the identification of alternatives, particularly where these may be of a technical nature;
- be open to the consideration of all reasonable alternatives; and
- be prepared for possible modifications to the project proposal before settling on a preferred option.

The role of the public is to:

- assist in the identification of alternatives, particularly where local knowledge is required;
- be open to the consideration of all reasonable alternatives; and
- recognise that rarely one favoured alternative sites all stakeholders and that alternatives will be evaluated across a broad range of criteria, including environmental, social, and economic aspects.

The applicability of each alternative type to the proposed project is outlined in **Error! Reference source not found.**It m ust be highlighted that the alternatives presented in the table are derived from both the EIA Regulations (2014) as amended and the Department of Environmental Affairs (now Department of Forestry, Fisheries, and the Environment) 2004 Integrated Environmental Information Series on the Criteria for determining alternatives in EIA. This report will further discuss where the alternative applies to the project.

Table 17: Applicability of Alternative Types

Alternative	Applicability
No-go Option	The 'no-go' alternative is sometimes referred to as the 'no-action' alternative (Glasson *et al.,* 1999) and, at other times, the 'zero-alternative.' It assumes that the activity does not go ahead, implying a continuation of the current situation or the status quo. This alternative must be discussed on all projects as it allows for assessing impacts should the activity not be undertaken. **This alternative is discussed in this report and not recommended.**
Activity alternatives	These are sometimes referred to as project alternatives, although the term activity can be used broadly to embrace policies, plans, programs, and projects. Considering such

Alternative	Applicability
	alternatives requires a change like the proposed activity, which would entail a process where a different project is proposed. **Only one activity alternative is discussed in this report.**
Location/ property alternatives	Location alternatives could be considered for the entire proposal or a proposal component. The latter is sometimes considered under site layout alternatives. A distinction should also be drawn between alternative locations that are geographically entirely separate and alternative locations that are in proximity. In the case of the latter, alternative locations in the same geographic area are often referred to as alternative sites. As indicated above, sites were awarded as part of the Eskom land tender, and only awarded sites were made available for use. However, a thorough assessment of the awarded sites and establishing sensitivity buffers was conducted to ensure the least sensitive footprint within the identified sites was developed. **Only one site location is proposed for Renewstable® Qhakaza.**
Process alternatives	Various terms are used for this category, including technological alternatives and equipment alternatives. Considering such alternatives includes achieving the same goal using a different method or process. For example, an industrial process could be changed, or an alternative technology could be used. These are also known as technological and equipment alternatives and will be discussed as they apply to the type of technology. **Two technologies are considered, i.e. hydrogen fuel cell and solar energy storage which are detailed in this report.**
Demand alternatives	Demand alternatives arise when a demand for a particular product or service can be met by some alternative means. This applies to the demand for a product or service. An example of this would be where there is a need to provide more electricity. The proposed project is an energy generation project and forms part of the Renewable projects that are commissioned to respond to the energy demand. **However, demand alternatives are not discussed in this report.**
Scheduling alternatives	These are sometimes known as sequencing or phasing alternatives. In this case, an activity may comprise several components, which can be scheduled in a different order or at different times and, as such, produce different impacts. **No scheduling alternatives were considered.**
Input alternatives	By their nature, input alternatives are most applicable to industrial applications that may use different raw materials or energy sources in their processes. **The proposed**

Alternative	Applicability
	project is a solar power plant, implying that the energy source is the sun. No alternative sources are discussed as part of the project.
Routing alternatives	Alternative routes, such as power lines, transport, and pipeline routes, are generally considered for linear developments. The proposed project seeks to identify and assess the most suitable corridor for constructing a power line with the least environmental impact. The only linear activities are roads, and no alternatives are considered for roads.
Site layout alternatives	Site layout alternatives permit consideration of different spatial configurations of an activity on a particular site. This may include specific components of a proposed development or the entire activity. The feasibility phase considered various layouts within the identified site, to honour the legislated environmental buffers. Following this, the least sensitivity layout was presented as the base case. This report only focuses on one layout option within the site.
Scale alternatives	In some cases, activities that can be broken down into smaller units can be undertaken on different scales. For example, a housing development within an overall mixed-use development could have the option of 1,000, 2,000, or 4,000 housing units. Each of these scale alternatives may have different impacts. The proposed project is proposed as a mono phase, as such, scale alternatives are not discussed further in this report.
Design alternatives.	This entails considering different designs for aesthetic purposes or construction materials to optimise local benefits and sustainability, which would constitute design alternatives. No design alternatives are considered.

8.1 DETAILS OF ALL THE ALTERNATIVES CONSIDERED

This section describes the alternatives/ options considered for Renewstable®Qhakaza project as follows:

- Technology Alternative
  - Hydrogen Fuel Cell Technology
  - Solar Energy Storage Technology
- No Go Alternative

8.1.1 TECHNICAL ALTERNATIVE

8.1.1.1 Hydrogen Cell Technology

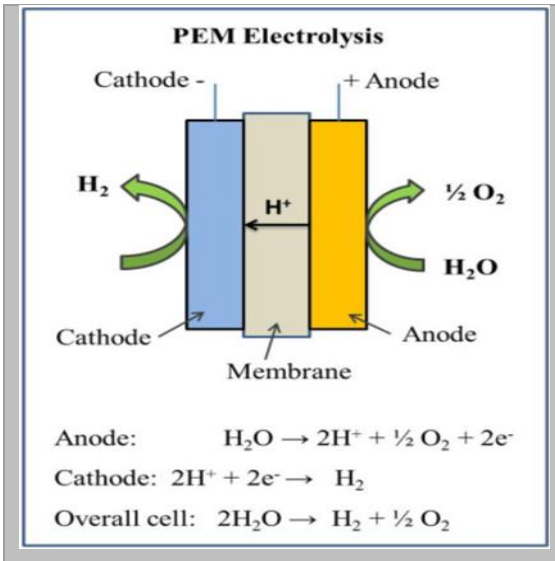
Three different hydrogen fuel cell technologies exist on the market: alkaline, PEM, and solid oxide. The main difference between the technologies is the electrolyte used. The electrolyser is a system that produces hydrogen from the

electrolysis of water. The system can use either PEM1 or alkaline-technology electrolysers with DC power to induce an electrochemical reaction (i.e., water electrolysis). The final products of the water electrolysis process will be hydrogen gas, which will be stored, and oxygen, which will be released into the atmosphere. In the case of the Renewstable® concept, the electrolyser uses renewable energy to produce the hydrogen that will store the energy. Green hydrogen is one of the most promising ways to store renewable energy; HDF-Energy has put this potential into reality in a concrete and competitive application.

Only two of the three electrolyser technologies are considered for the proposed project. The alternatives are provided with detailed descriptions and comparative analyses.

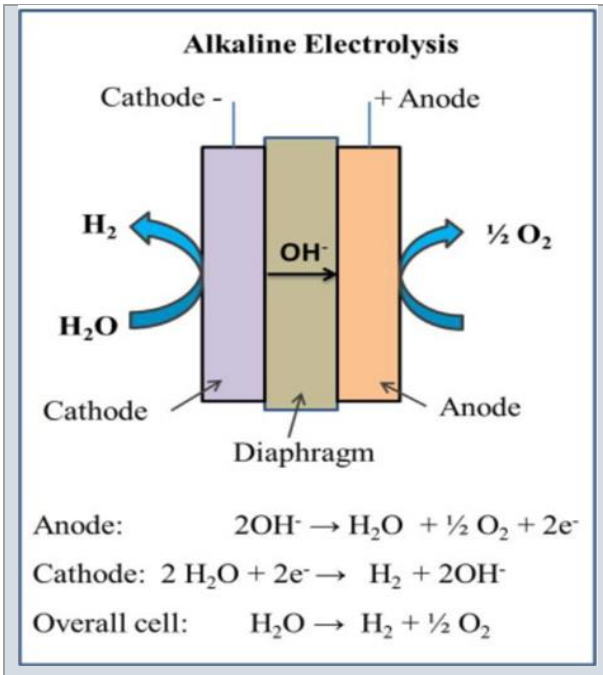
a) **Proton Exchange Membrane (PEM)**

Proton Exchange Membrane electrolysis is the electrolysis of water in a cell equipped with a solid polymer electrolyte responsible for conducting protons, separating product gases, and electrical insulation of the electrodes. Water electrolysis is one of the most promising alternatives to storing energy from renewable energy resources. In terms of sustainability and environmental impact, PEM water electrolysis was considered one of the most promising techniques for high-purity, efficient hydrogen production from renewable energy sources. It emits only oxygen as a byproduct without any carbon emissions.

Process Description	Process Flow
In PEM water electrolysis, water is electrochemically split into hydrogen and oxygen at their respective electrodes, such as hydrogen at the cathode and oxygen at the anode. PEM water electrolysis is accrued by pumping water to the anode, where it is split into oxygen (O2), protons (H+) and electrons (e–). These protons travel via the proton-conducting membrane to the cathode side. The electrons exit from the anode through the external power circuit, providing the reaction's driving force (cell voltage). The protons and electrons re-combine at the cathode side to produce the hydrogen.	

b) **Alkaline Water Electrolysis**

Hydrogen production by alkaline water electrolysis is a well-established technology for commercial use worldwide up to the megawatt range. The technology operates at lower temperatures, such as 30–80 °C, with an aqueous solution (KOH/NaOH) as the electrolyte, with a concentration of ~20% to 30%.

Process Description	Process Flow
In the alkaline water electrolysis process, initially at the cathode side, two molecules of alkaline solution (KOH/NaOH) were reduced to one molecule of hydrogen (H2), and two hydroxyl ions (OH−) were produced. The produced H2 is eliminated from the cathode surface to recombine in a gaseous form, and the hydroxyl ions (OH−) transfer under the influence of the electrical circuit between anode and cathode through the porous diaphragm to the anode, here in discharged to ½ molecule of oxygen (O2) and one molecule of water (H2O). The O2 recombined at the surface of the electrode escapes as hydrogen.	

A comparative analysis of the two technologies is provided in Table 18.

Table 18: Comparative Analysis

Advantages and Disadvantages	Electrolysis Process	
	Alkaline Electrolysis	PEM
Advantages	• Well-established technology • Non-noble electro catalysts • Low-cost technology • The energy efficiency is (70–80%) Commercialized	• Compact design, therefore small footprint • High current density (above 2 A cm−2), • High efficiency, fast response, operates under lower temperatures (20–80 °C) and produced ultrapure hydrogen and produced oxygen as a byproduct High purity of gases (99.99%)

Advantages and Disadvantages	Electrolysis Process	
	Alkaline Electrolysis	PEM
		• Higher energy efficiency (80–90%) • High dynamic operation
Disadvantages	• Low current densities • Formation of carbonates on the electrode decreases the performance of the electrolyser • Low purity of gases • Low operational pressure (3–30 bar) • Low dynamic operation	• New and partially established • High cost of components • Acidic environment • Low durability •

Of the fuel cell systems currently available on the market, only those employing PEM technology have sufficient capacity to be used for multiple-megawatt applications. The fuel cells to be used for the projects will be supplied by HDF-Energy. The projects differ substantially from solar PV systems that provide intermittent power with minimal or no storage and will, therefore, help increase the penetration of renewable energy without causing intermittency issues. By combining hydrogen and lithium storage technologies, the project offers a clean, carbon-free, viable, non-intermittent, and renewable baseload solution that will help sustain the grid's stability at a competitive cost and with no hidden fees. It will deliver baseload power to the grid operator 24 hours per day, seven days a week, with an availability (i.e., capacity factor) higher than 85%.

8.1.2 SOLAR ENERGY STORAGE

Batteries Technology has been selected as the preferred short-term solar energy storage technology. In contrast, hydrogen fuel cells have been selected as the preferred technology for the longer-term storage of solar energy from the Project.

Other potential alternative solar energy storage technologies include:

- pumped-storage hydropower,
- thermal energy storage,
- flywheel storage, and
- compressed air storage.

However, these alternative technologies are not preferred for the following reasons:

- Implementation of pumped-storage hydrogen technologies would require specific topographical conditions, large quantities of water, and an extensive surface area.
- Pumped-storage hydropower projects are usually very large-scale (GigaWatts) and entail high capital expenditures because of the complexity of their engineering requirements.
- Thermal, flywheel, and compressed air energy storage alternatives are low-maturity technologies, and no relevant commercial solution is on the market for projects of the size of the ones developed in Mpumalanga.

Batteries (especially Lithium-Ion batteries) are a well-matured technology. In contrast, hydrogen technologies (e.g., electrolysis, fuel cells, and storage) are well-known worldwide and are scaling up for use in various industries. HDF-Energy identifies a combination of lithium-ion batteries and hydrogen technologies as the most technically and economically feasible solution for short—and long-term energy storage.

8.1.3 NO-GO ALTERNATIVE

Under GN R.982, consideration must be given to the option not to act, in which an alternative is usually considered when the proposed development is envisaged to have significant adverse environmental impacts that mitigation measures cannot ameliorate effectively. The no-go alternative would be not undertaking the proposed project's development. This implies that if the current electricity supply network is not strengthened, industrial development in the area will be hindered, and the integration of potential renewable energy will not be possible. Should the no-go alternative be adopted, the country will be deprived of a much-needed essential service, particularly given the existing energy supply challenge. Furthermore, the identified benefits will not materialise. The no-go would result in the project property continuing to be used as it is currently – for agricultural purposes, already dominant activity in the area. Conversely, proceeding with the Projects as proposed will increase the share of renewables in the country's energy mix while helping to reduce existing and future supply vulnerability. The no-go alternative will be used as a baseline throughout the assessment, against which potential impacts will be compared and assessed in the EIR.

9 PUBLIC PARTICIPATION PROCESS

Social risks are a product of social development, and modern civilisation can further be defined as the potential for any loss, conflict, or instability due to specific issues in projects (e.g., investments, policies, or decisions) and the reaction of related stakeholders that are confronted with negative influences due to proposed projects. Social Risks cannot be eliminated; they can be effectively managed to mitigate the negative impacts. The Public Participation Process (PPP) is any process that involves the public in problem-solving and decision-making; it forms an integral part of the Scoping and EIA process. The PPP provides I&APs with an opportunity to provide comments and raise concerns or make suggestions that may enhance the project's benefits. The main principle of Public Participation holds that those affected by a decision have the right to be involved in the decision-making process (i.e., the public's contribution will influence the decision).

The principles of public participation are to ensure that the PPP:

- Communicates the interests of and meets the process needs of all participants;
- Seek to facilitate the involvement of those potentially affected;
- Involves participants in defining how they participate;
- Is as inclusive and transparent as possible;
- It must be conducted in line with the requirements of Regulations as amended;
- Actively enhances the leadership capacity of community members, leaders, and groups within the community; and
- Utilises a community's diversity to deepen shared understanding and produce outcomes of long-term benefit to the whole community or society.

Against this backdrop, the Regulation governing public participation and engagement was developed. The Public Participation approach adopted for the project is in line with the process contemplated in Chapter 6, Regulation 39 through 44 of the 2014 EIA Regulations as amended in terms of the National Environmental Management Act, 1998 (Act 107 of 1998), The Notice requires that the EAP must ensure that:

- All reasonable measures are taken to identify potentially Interested and Affected Parties (I&APs); and
- Participation by registered I&APs is facilitated so they are provided with a reasonable opportunity to comment on the application.

The PPP approach adopted is detailed hereunder.

9.1 APPROACH AND METHODOLOGY

Chapter 6, Regulation 39 through 44 of the EIA Regulations stipulates that the person conducting a public participation process must consider any relevant guidelines applicable to public participation as contemplated in section 24J of the

Act and must give notice to all potential I&APs and stakeholders of application or proposed application that is subjected to the public involvement. Furthermore, other regulations were considered, including the Protection of Personal Information Act, 2013 (Act 04 of 2013), which regulates information sharing and record keeping.

9.1.1 IDENTIFICATION OF INTERESTED AND AFFECTED PARTIES

Interested and Affected Parties (I&APs) identified include pre-identified stakeholders (government departments), landowners, and the public. Notification and request for comments will be submitted to the following key stakeholders:

Table 19: List of pre-identified stakeholders

- Mpumalanga Department of Agriculture and Rural Development and Land and Environmental Affairs
- Mpumalanga Department of Water and Sanitation
- Mpumalanga Department of Transport and Public Works
- Mpumalanga Tourism and Parks Agency
- Mpumalanga Heritage Resources Agency
- DFFE Biodiversity Section
- DFFE Protected Area, Planning and Management Effectiveness.
- DFFE Climate Change Directorate
- South African Heritage Resource Agency
- Eskom Distribution
- Eskom Majuba Power Station
- Dr Pixley Ka Seme Isaka Local Municipality
- Gert Sibande District Municipality
- Civil Aviation Authority
- National Transmission Company of South Africa (NTCSA)
- Endangered Wildlife Trust
- Afrika Farm Nature Reserve
- BirdLife SA
- AGRI SA
- South African National Road Agency Limited

9.1.2 PUBLIC PARTICIPATION DATABASE

Following the requirements of the EIA Regulations under Section 24 (5) of NEMA, Regulation 42 of GN R. 982, the public participation practitioner must keep a register of I&APs. To fulfil this requirement, such a register is compiled, and details of I&APs, including their comments, will be updated throughout the project cycle. The database is in place and will be submitted with the Final Scoping Report.

9.1.2.1 Stakeholder Mapping

Stakeholder mapping has been conducted to support identifying key stakeholders and database updates. The maps will also assist in identifying suitable locations for placing notices, reports, and public meeting venues.

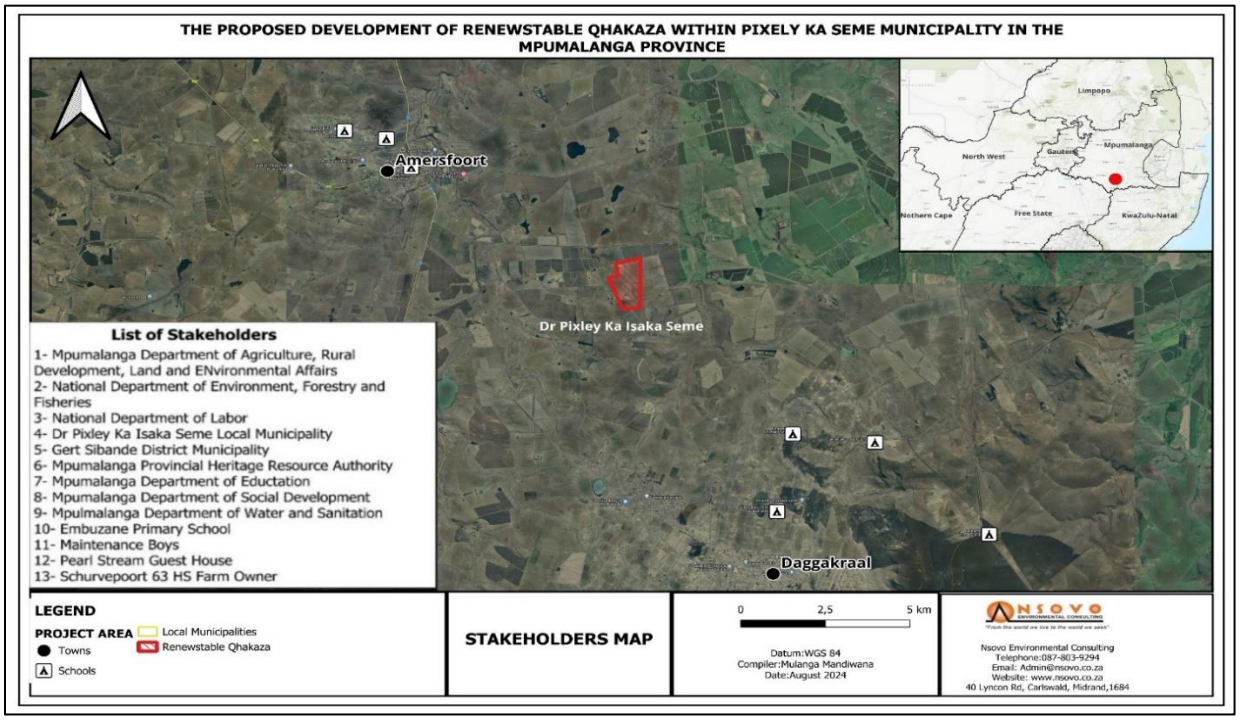


Figure 11: List of stakeholders

Table 20: Stakeholder Risk Mapping

Identified Risk	• Potential complaints and conflicts from farmers. • Community unrest • Increased crime • Mobbing and lobbying against the project.
Mitigation Measures	• Active engagements with property owners.

	• Improved maintenance of vehicles, trains, and track routing to avoid potential leaks from the trains. • Develop and implement a system for affected farmers to submit their complaints. • Implementation of the Authority approved Public participation plan to avoid approval delays or negative decisions. • Transparent engagements with the locals about the project. • Develop a project-specific Grievance Procedure • Ensure timeous response to issues raised. • Avoid promising unachievable targets, particularly employment-related • Community Integration with a focus on addressing gender inequality.
Local Languages	• English, Afrikaans, Isizulu
Newspaper	• Volksrust Advertiser

9.1.3 SITE NOTICES

A2 size notices indicating the availability of the Draft Scoping Report and contact details for the request of the hard copy or soft copy of the report will be fixed at different conspicuous locations within and around the proposed project area. The photographic evidence of site notices will be submitted with the Final Scoping Report. The site notices will be fixed in the areas indicated below.

- Along the P48-3 Road near residential areas
- Site entrance
- At the corner of the unnamed road to Daggakraal Town
- N11 from Amersfoort to Volksrust
- Amersfoort Town Cnr R35 & N11 next to Magistrate Court
- Public facilities such as the Magistrates Court, Clinics, Police Station and commercial centres.

Additional sites close to the site will be identified, and notices will be placed.

9.1.4 PLACEMENT OF AN ADVERTISEMENT IN THE LOCAL NEWSPAPER

A newspaper advertisement will be placed in Volksrust Advertiser on 13th September, 2024, to inform I&APs of the proposed availability of the Draft Scoping Report and public meetings. Proof of Newspaper Advert will be included in the Final Scoping Report.

9.1.5 Placement Of The Reports For Review And Comments

The Draft Scoping Report will be made available in hard copies to I&APs at the Amersfoort and Volksrust Public Libraries, as well as other areas that will be identified for hard copy placement. Soft copies will be emailed to all stakeholders mentioned in Section 9.1.1 above, landowners, and registered I&APs. The link to the dSR will also be available on request and on the Nsovo website (www.nsovo.co.za). The reports and associated annexures will be available for 30 calendar days from 14th of September 2024.

9.1.6 Public Meetings

As part of the PPP, public meetings will be arranged accordingly, and I&Aps will be informed through notices and newspaper advertisements. The engagements will take cognisance of the local languages in the area, i.e., isiZulu, English, and Afrikaans. Furthermore, the public meetings will be twofold, including:

- Focus group meetings with directly affected parties, such as landowners and other stakeholders
- Public Meeting

Public meetings will be held in the morning and afternoon to accommodate various community groups. The table below provides details of the public meeting.

Table 21: Public Meeting Schedule

Date	Venue	Time
08th October 2024	China 2 Community Hall (Ward 7)	10H00 – 12H00
	Ezamokuhle Community Hall (Ward 8)	14H00-16H00

9.1.7 A SUMMARY OF COMMENTS RAISED BY INTERESTED AND AFFECTED PARTIES

The issues, comments, and concerns raised during the public participation process and the responses provided by the Environmental Assessment Practitioner (EAP) will be incorporated into the Comment and Response Report to be submitted with the Final Scoping Report.

10 DESCRIPTION OF THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE ALTERNATIVES FOCUSING ON THE GEOGRAPHICAL, PHYSICAL, BIOLOGICAL, SOCIAL, HERITAGE AND CULTURAL ASPECTS

This section outlines parts of the socio-economic and biophysical environment likely to be affected during the proposed development's construction, operational, or decommissioning phases. Based on the project description and knowledge of the existing environment, the potential interactions between the project and the environment are presented. Moreover, the project's potential impacts on the human environment, socio-economic conditions, and physical and cultural resources are also presented.

Similarly, the National Web-based Environmental Screening Tool is a geographically based web-enabled application that allows a proponent intending to apply for environmental authorisation under the Environmental Impact Assessment (EIA) Regulations 2014, as amended, to screen their proposed site for any ecological sensitivity. Thus, it provides site-specific baseline information and risk assessment that guides the EIA process and review information.

Baseline information from various sources and the relevance of the different aspects of the project are summarised in the Table 22. The specialist report provides more baseline information.

Table 22: Summary of Baseline Assessment and Relevance to the Feasibility Study and Project

Aspect	Relevance
Climate	• It informs the design considering flood lines, i.e., 1: 10, 50, or 100 years. This will be important for the proposed designs. • It allows the team to propose mitigation measures specific to the site conditions.
Topography	• The slope provides the necessary information to determine the depth of foundations required to construct masts, culverts, bridges, and other infrastructure. • From an environmental angle, it informs the mitigation measures to be considered.
Terrestrial Biodiversity Impact Assessment	• It allows for avoidance or the creation of buffers around areas identified as highly sensitive. • Inform the requirements for permits if sites of critical biodiversity cannot be avoided. • It allows for the proposal of relevant mitigation measures.
Aquatic Assessment	• It allows for determining the regulated area of a watercourse in terms of water use, as listed in Section 21 (c) and (i). • Informs and confirms the requirements for WULA. • It allows for avoidance or creation of buffers around identified watercourses during the design phase that were feasible.

Aspect	Relevance
	• It allows for a proposer risk assessment and consideration of the flood lines.
Palaeontology	• To comply with the regulations of the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA).
Heritage	Each site is assessed for the possible occurrence of six categories of heritage resources • Built Environment / Cultural Landscape • Surface archaeological finds • Subsurface archaeological finds • Industrial archaeology • Graves & Burial Grounds • Intangible heritage To comply with the regulations of the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA). • It allows for avoiding or creating buffers around identified sites of heritage significance. • Phase 1 informs the requirements for permits if heritage sites cannot be avoided.

10.1 SOCIO-ECONOMIC DESCRIPTION

This section presents the socio-economic aspects focusing on the Province and Municipalities within the proposed study area.

10.1.1 PROVINCIAL DESCRIPTION OF THE PROPOSED PROJECT

Mpumalanga is divided into three district municipalities, including Gert Sibande, Ehlanzeni and Nkangala Districts. The proposed development will be conducted within one of the district municipalities (e.g., Gert Sibande). These three districts are further subdivided into 17 Local Municipalities. The province covers an area of 76 495km² with a population of approximately 4335,965 (IDP, 2017). The capital city of Mpumalanga is Mbombela (previously Nelspruit), and other major cities and towns include eMalahleni (previously Witbank), Standerton, eMkhondo (previously Piet Retief), Malalane, Ermelo, Barberton, and Sabie.

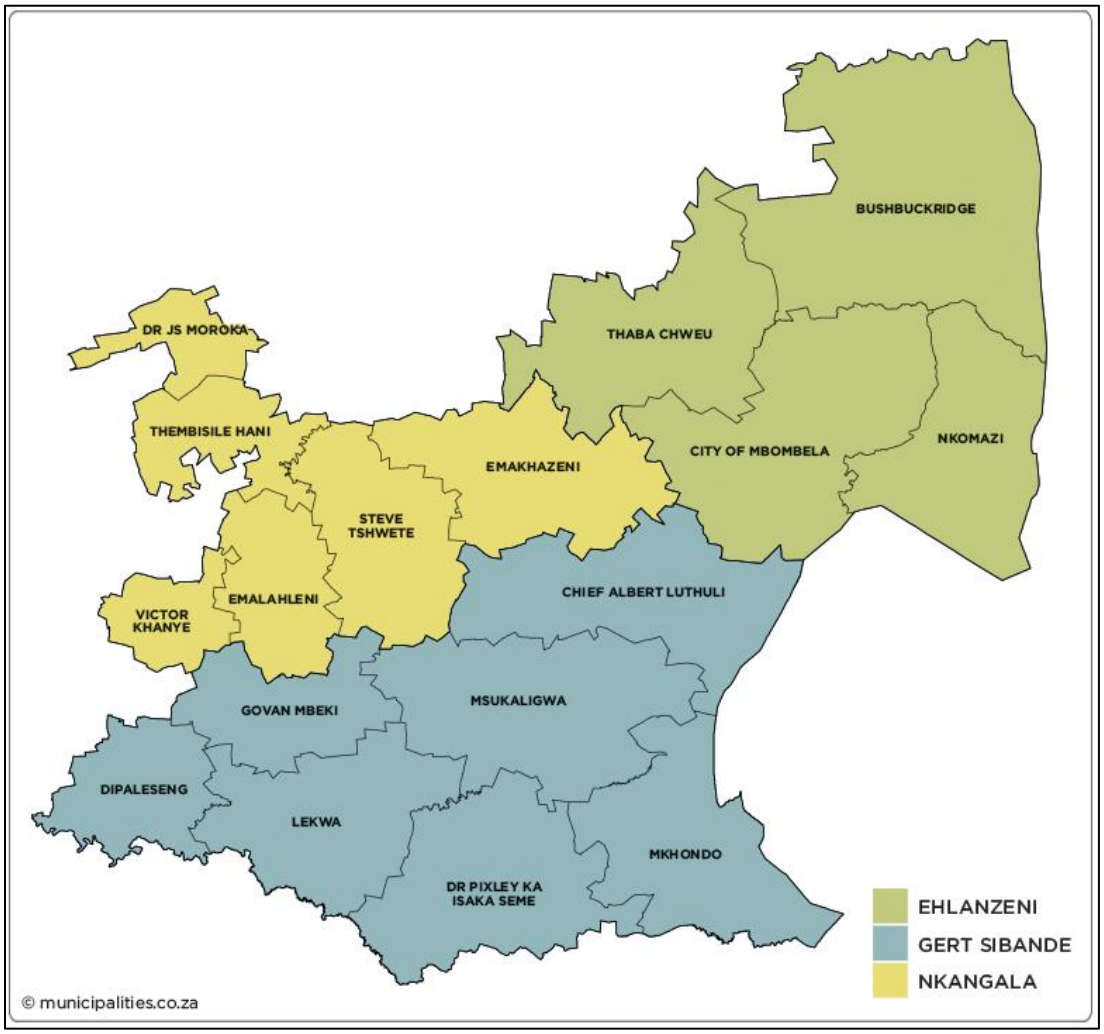


Figure 12: Municipal boundaries within the Mpumalanga Province (IDP,2024)

According to Census 2022, Mpumalanga has a population of 5 143 324 million. The population is predominantly black African, accounting for 90.7%, while Whites make up about 7.5% of the population. The province contributed about 8% towards the country's GDP in 2022. SiSwati (30,5%), IsiZulu (27,8%), Xitsonga (10,6%), Sepedi (10,3%) and IsiNdebele (9,9%) are the most spoken languages in the province. Mpumalanga's cultural heritage is celebrated through traditional music, dance, and art, representing the diverse ethnic groups, including the Swazi, Zulu, Ndebele, and Pedi communities.

Economically, Mpumalanga is driven by agriculture, mining, and tourism. The province is one of South Africa's key agricultural regions, producing crops such as maise, sugarcane, and citrus fruits, and it is also a significant centre for forestry. Mining is another cornerstone of the economy, with Mpumalanga being a substantial source of coal and other minerals like gold and platinum. Despite its economic strengths, the province faces challenges such as unemployment, poverty, and the need for infrastructure development, particularly in rural areas.

Mpumalanga struggles with inequality and joblessness, with 66.4% of the working population working. While there have been economic advancements, the province continues to require focused initiatives on education, skills development, and job creation to improve the livelihoods of its residents. Programs aimed at sustainable development and community upliftment are crucial for addressing these socio-economic challenges.

Approximately 93.7% of Mpumalanga's residents have access to electricity, and 47% report having access to piped water within their dwellings. However, like other provinces in South Africa, Mpumalanga faces significant challenges due to load shedding, which disrupts essential services such as telecommunications and water supply. Despite these obstacles, Mpumalanga remains rich in natural beauty and cultural depth, with significant growth and sustainable development potential.

10.1.2 DISTRICT MUNICIPALITY WITHIN WHICH THE STUDY AREA IS LOCATED

The Gert Sibande District Municipality is a Category C Municipality in Mpumalanga Province. It borders the Mpumalanga districts, namely Ehlanzeni and Nkangala District Municipalities, to the north, South African provinces such as KwaZulu-Natal and Free State provinces to the south, and Gauteng province to the west (www.odm.org.za). According to the IDP (2017), this is the largest district in the Mpumalanga province. It is comprised of seven local municipalities: Govan Mbeki, Chief Albert Luthuli, Msukaligwa, Dipaleseng (the proposed area of the project), Mkhondo, Lekwa, and Dr Pixley ka Isaka Seme Local Municipality, Figure 13 below.

Figure 13: Local Municipalities Within the District (IDP, 2024)

According to the 2022 Census, the population is predominantly black African, accounting for about 93.6%, with a mix of other ethnic groups, including Whites,5% of the population and Indian and coloured, 0.15% of the total population.

The most spoken languages are isiZulu (36.5%), followed by Siswati (25.7%) and Afrikaans (11.3%), reflecting the region's rich cultural mosaic.

Economically, Gert Sibande is one of Mpumalanga's most significant districts, driven by its agricultural solid, mining, and energy sectors. The district is a central agrarian hub, producing large quantities of maise, soybeans, and livestock. The farming activities are vital for local consumption and the broader South African market. The mining sector, particularly coal mining, is a cornerstone of the district's economy. Gert Sibande is one of South Africa's largest coal-producing regions, with coal mining providing substantial employment and contributing significantly to the national economy. The presence of several Eskom-operated power stations, including the Kendal and Kriel power stations, further underscores the district's role in powering the nation's energy grid.

Despite its economic strengths, Gert Sibande faces considerable socio-economic challenges. Unemployment remains a pressing issue, with a significant portion of the population needing help to access sustainable employment opportunities. Additionally, there are disparities in access to essential services, particularly in rural areas. According to recent data, approximately 91.8% of households in Gert Sibande have access to electricity, which is relatively high. However, only 56.5% of households have access to piped water inside their dwellings, indicating a significant gap in water service delivery that needs urgent attention to improve living conditions and support sustainable development.

Agriculture remains a critical sector in Gert Sibande, with the region's fertile lands and favourable climate supporting a diverse range of crops. Maize and soybeans are the primary crops, while livestock farming, including cattle, sheep, and poultry, plays a significant role in the local economy. The agricultural sector is vital for food security and employs the value chain, contributing to rural development and poverty alleviation. Embracing sustainable farming practices is essential for ensuring the long-term viability of this sector and the well-being of the communities that depend on it.

The combination of Gert Sibande District Municipality's economic potential, cultural diversity, and natural resources positions it as a vital area within Mpumalanga. However, addressing socio-economic challenges, particularly in service delivery and employment, is crucial for unlocking the region's full potential and ensuring equitable and sustainable development for its residents.

10.1.3 LOCAL MUNICIPALITY WITHIN WHICH THE PROPOSED STUDY AREA IS LOCATED

The Dr. Pixley Ka Isaka Seme Local Municipality is a Category B municipality located within the Gert Sibande District Municipality. The Municipality is named after Dr. Pixley ka Isaka Seme, a founding member of the African National Congress (ANC). The Municipality is situated on the eastern border between Mpumalanga and KwaZulu-Natal. It is framed by the Mkhondo Municipality in the east, Msukaligwa Municipality to the north, and Lekwa Municipality to

the west. It comprises an area of approximately 5227.98km², which includes Amersfoort, Ezamokuhle, Perdekop, Volksrust, Vukuzakhe, Wakkerstroom, and Daggakraal.

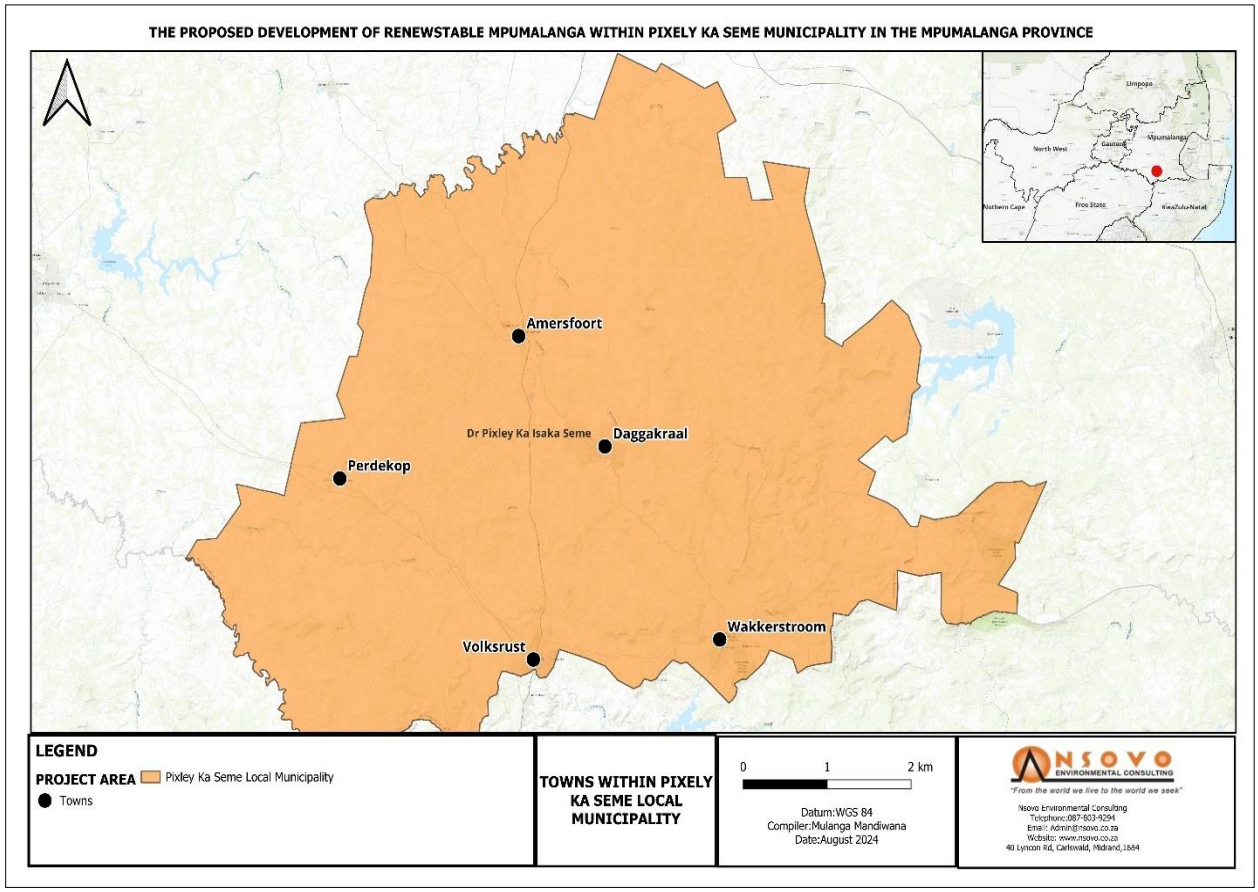


Figure 14: Towns within the Municipality (Nspvo,2023)

According to the 2022 Census, the Municipality has a total population of 115,304 individuals. The gender distribution within the municipality is slightly skewed, with females making up 52% of the population, while males account for 48%. Educational institution attendance among individuals aged 5 to 24 years stands at 70.6%, indicating significant school and tertiary education engagement in this age group. Additionally, 89.7% of municipal households reside in formal dwellings, reflecting a relatively high standard of housing infrastructure across the area.

Socioeconomic challenges within the Municipality include high unemployment rates, inadequate access to essential services such as water and sanitation and limited economic opportunities. The area's dependence on agriculture makes it vulnerable to climate change and other environmental challenges. Efforts to stimulate economic growth often focus on improving infrastructure, enhancing agricultural productivity, and promoting small-scale industries.

This section presents the socio-economic aspects of the Province and Municipalities within the proposed study area.

10.1.4 Climatic Condition of The Proposed Area

The study areas fall within the Cwb according to the Köppen-Geiger climate classification. This region is characterised by a warm temperate climatic zone, with dry and cold winters and warm, wet summers. Temperatures vary from a minimum of 8.41 °C in July to a maximum of 27.7 °C in December and January, respectively. Table 23 and Figure 15 The average monthly maximum and minimum temperatures below indicate the summer season, with high temperatures typically ranging from 16.33 °C to 24.11 °C. Low temperatures characterise the winter season.

Table 23: Average monthly, maximum, and minimum temperatures

Months	Minimum (°C)	Maximum (°C)	Average (°C)
January	16.37	27.7	23.77
February	16.26	27.44	23.72
March	15.28	26.9	22.97
April	13.05	24.65	20.55
May	11.03	24.01	18.95
June	8.35	21.95	16.33
July	8.41	21.46	16.38
August	10.58	23.98	19.24
September	13.51	26.13	19.24
October	14.69	26.4	21.97
November	15.67	27.14	22.63
December	16.46	27.7	24.11

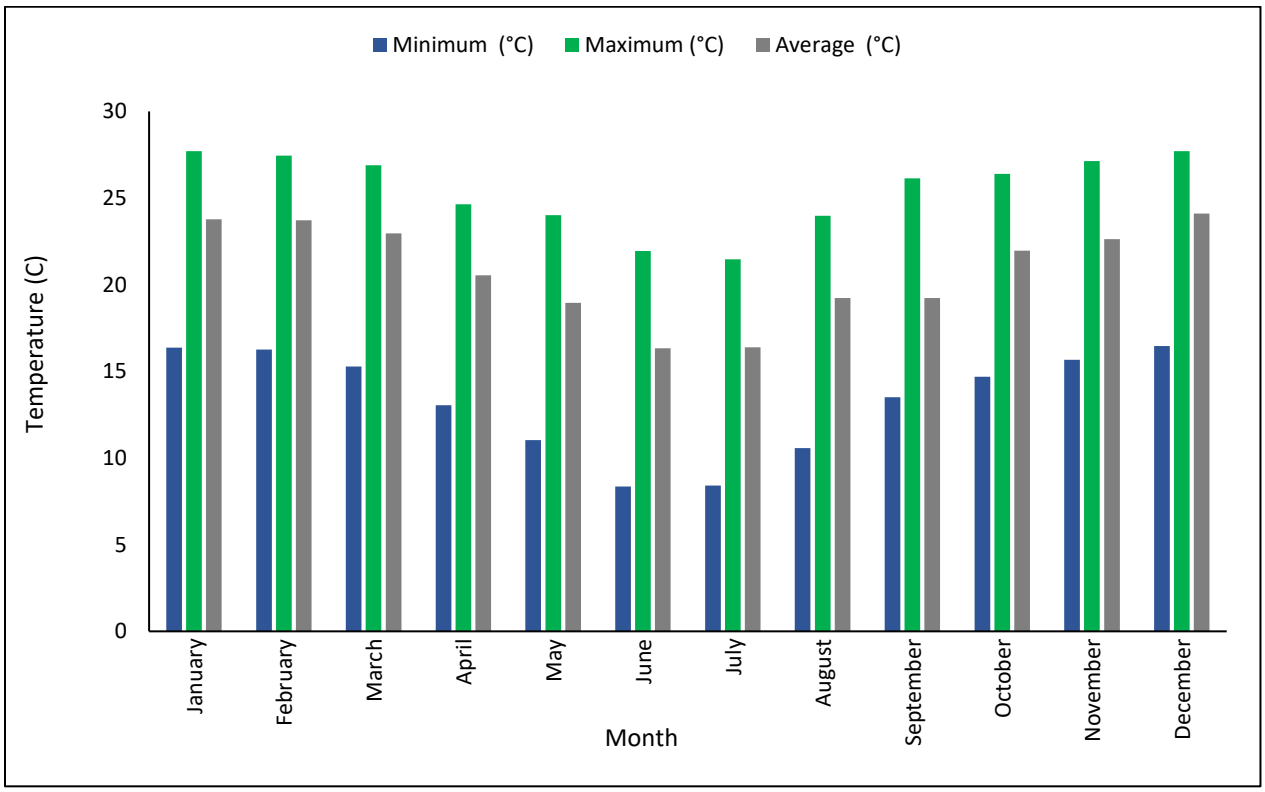


Figure 15: Average monthly, maximum, and minimum temperatures.

Köppen-Geiger has classified the region as dry winter and wet summer seasons. The region falls in the summer rainfall area, with an average annual rainfall of 792.7 mm/annum. More than 85% of rainfall occurs between October and March. The highest rainfall occurs during January and reaches about 150.3 mm, and the lowest rainfall of 5.2 mm occurs during July. Evaporation is high compared to rainfall, with annual evaporation of 1921 mm. High evaporation of 220.6 mm occurs during January, while low evaporation of 96 mm occurs during July. The Table 24 and Figure 16 below indicate the average monthly rainfall and evaporation.

Table 24: Average monthly rainfall and evaporation (mm), 1980 – 2023. (DWS station C1E007).

Months	Average monthly rainfall (mm)	Average monthly evaporation (mm)
January	150.3	214.4
February	102.9	181.8
March	80.9	172
April	42.5	131.7
May	13.5	111.3
June	10	87.4
July	5.2	96
August	9.9	131.9

Months	Average monthly rainfall (mm)	Average monthly evaporation (mm)
September	25.6	181.3
October	96.7	204.4
November	120.3	206.8
December	142.2	220.6

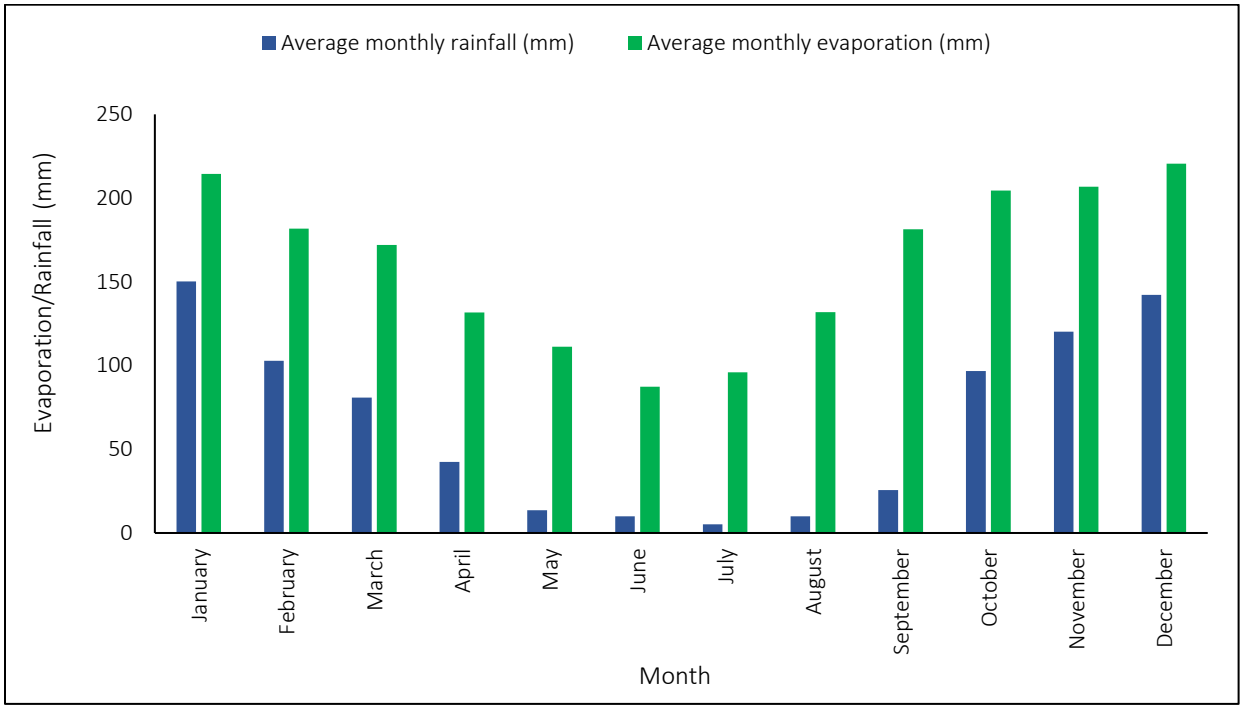


Figure 16: Average monthly rainfall and evaporation (mm), 1980 – 2023. (DWS station C1E007).

10.1.5 GEOLOGY WITHIN THE STUDY AREA

10.1.5.1 Regional geology

The geology of the Karoo Supergroup underlies the site's regional geology. This supergroup has largely been deposited in various localities, including the Main Karoo Basin, and significant deposits, which include Tuli, Springbok flats, Tshipise, and Ellisras Basin.

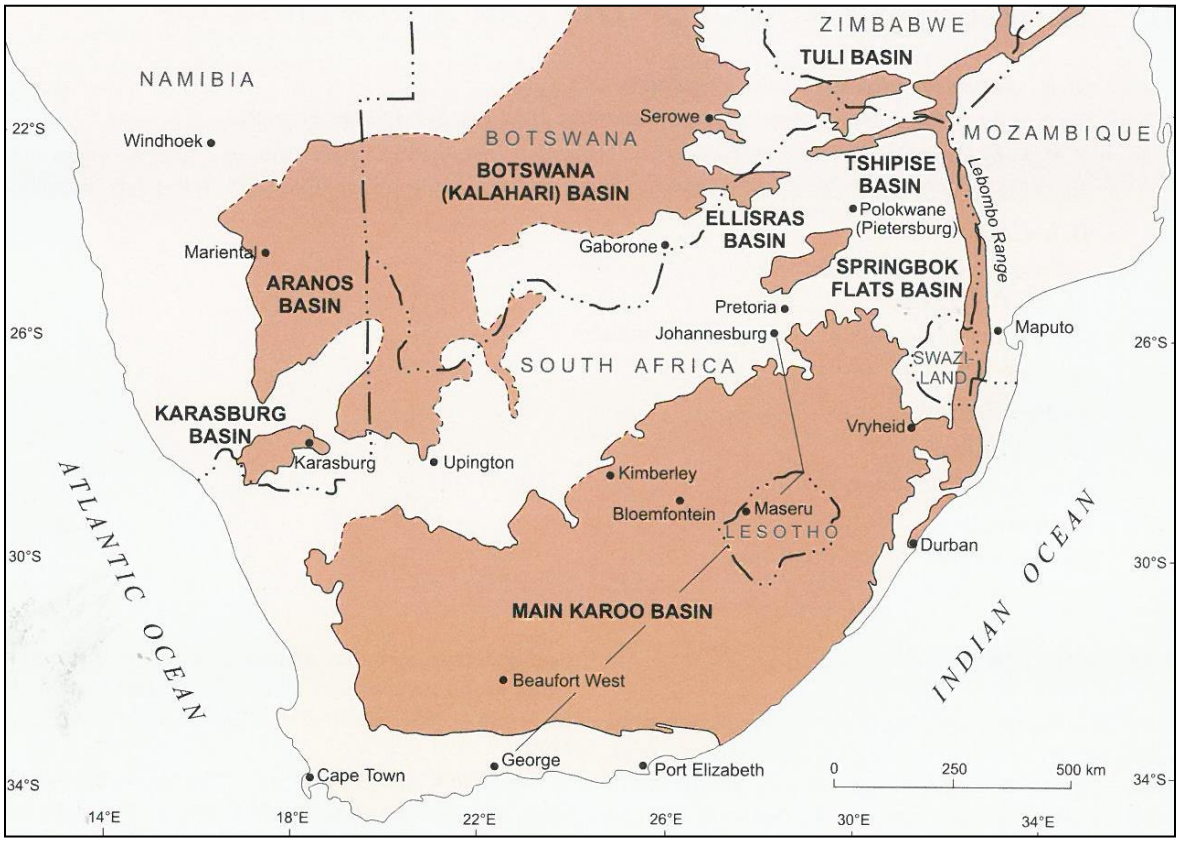


Figure 17: Location of the Karoo Basins (Johnson et al., 2006).

A large portion of the Karoo Supergroup is the Main Karoo Basin, which covers an area of approximately 700,000 km2 in South Africa. These basins range in age from late carboniferous to Middle Jurassic. The Karoo Supergroup is subdivided into different geological groups, including the Drakensberg and Lebombo Groups, the Molteno, Elliot, and Clarens Formations, the Beaufort Group, the Ecca Group, and the Dwyka Group (Johnson et al., 2006).

The Dwyka Group forms the base of the Karoo Supergroup. The supergroup rests on the Precambrian bedrock, mainly in the northern basin margin, overlies unconformably or para conformably in the rocks of the Cape Supergroup in the southern part, and unconformably overlies the Natal Group and Msikaba Formation.

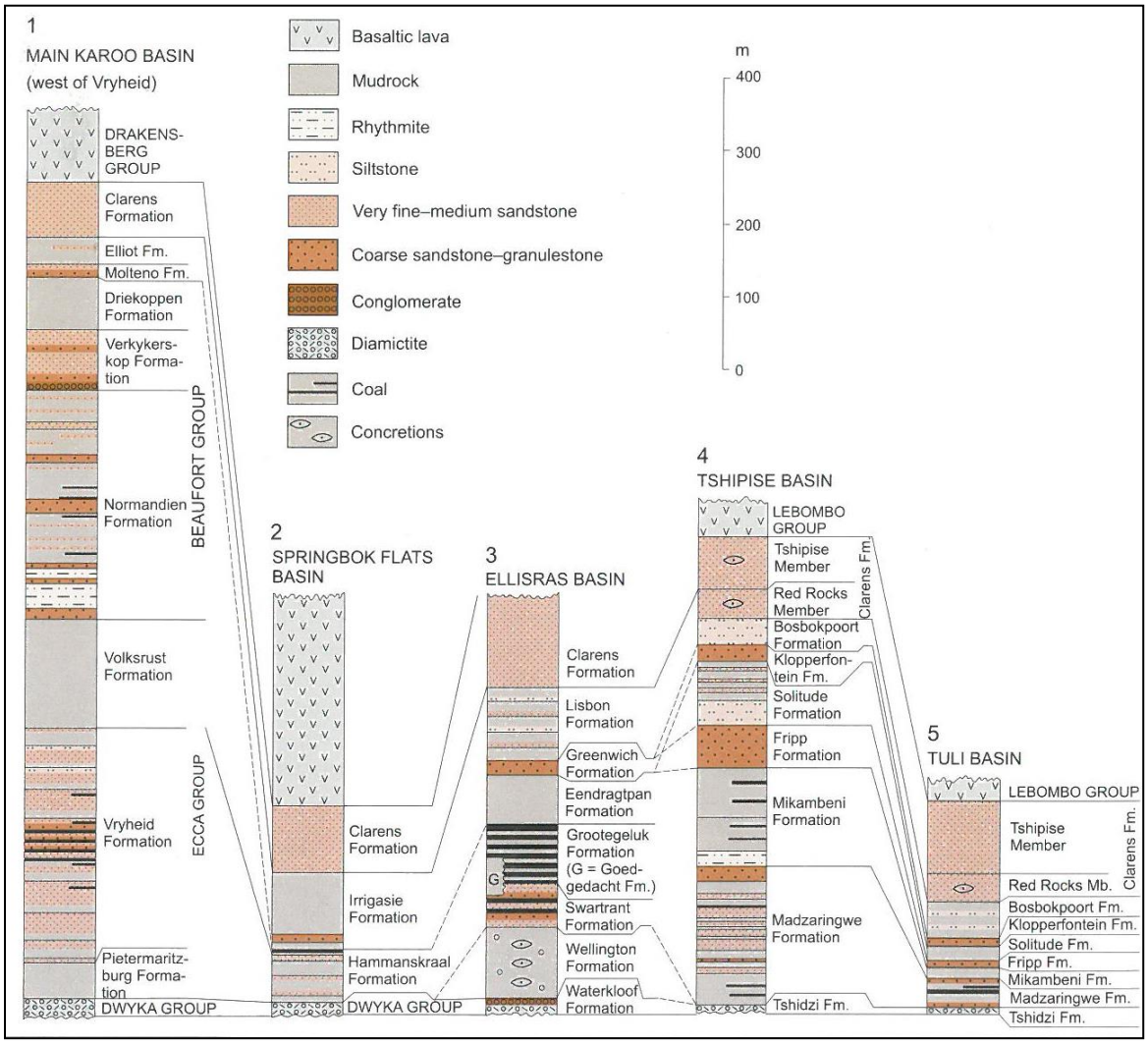


Figure 18: Stratigraphy of the Karoo Supergroup Basins (Johnson et al., 2006).

10.1.5.2 Local geology

The local geology of the site is characterised by two geological units which underlie the study area. These are:

- Karoo Dolerite
- Volksrust Formation

A large portion of the farm is covered by Volksrust Formation with a dolerite dyke that intruded the southeast corner of the property.

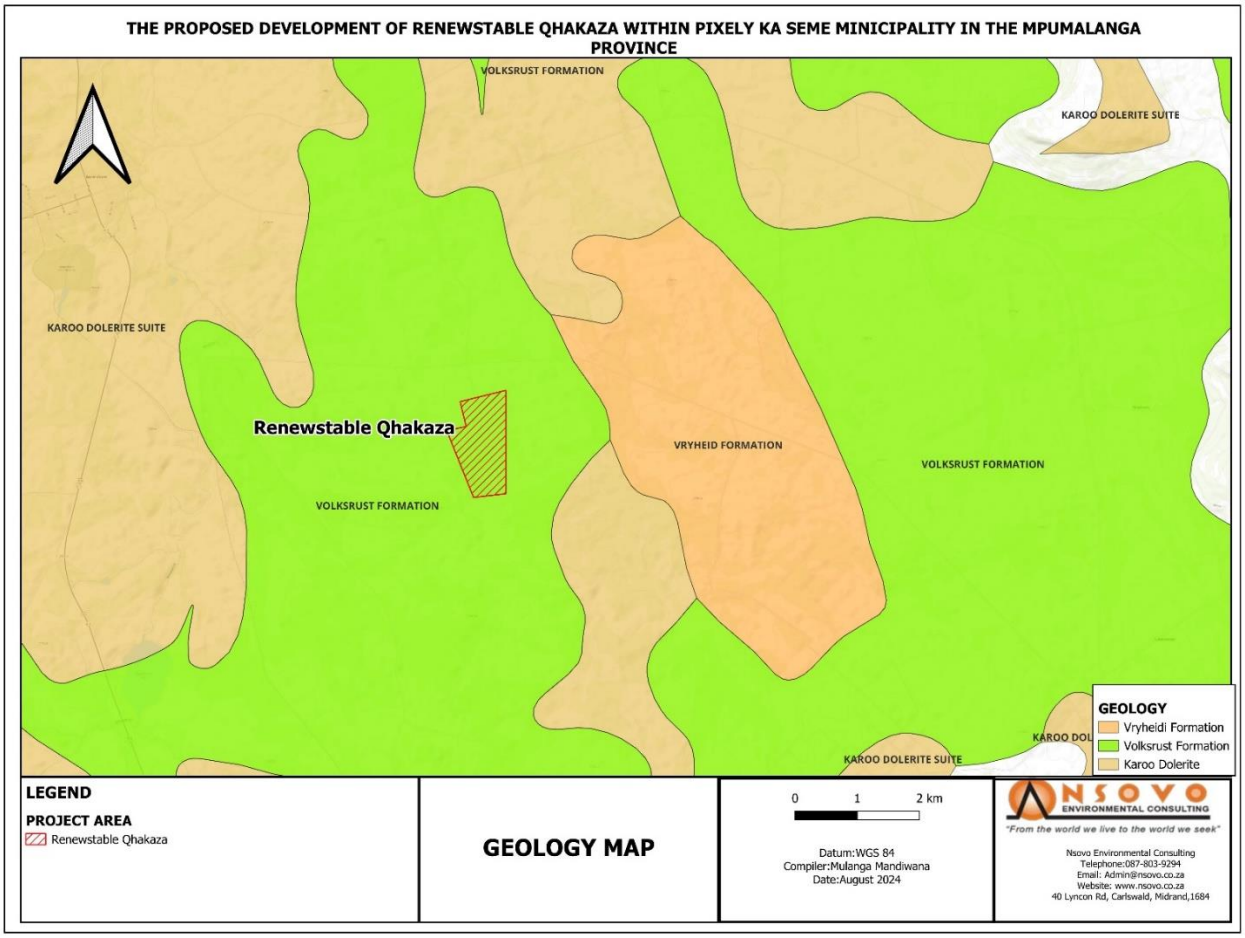


Figure 19: Geological map of the study area (NRN Consulting, 2023)

10.1.6 HYDROLOGY

The proposed study area falls under quaternary catchments X13L and X24H in the Nkomati/Usutu quaternary catchments of the Inkomati WMA (refer to **Figure 20** of the hydrological map). The Inkomati-Usuthu WMA is in the north-eastern side of South Africa and borders Mozambique to the east and Swaziland to the southeast. Administratively, most of the WMA falls within Mpumalanga Province, with a portion within Limpopo Province.

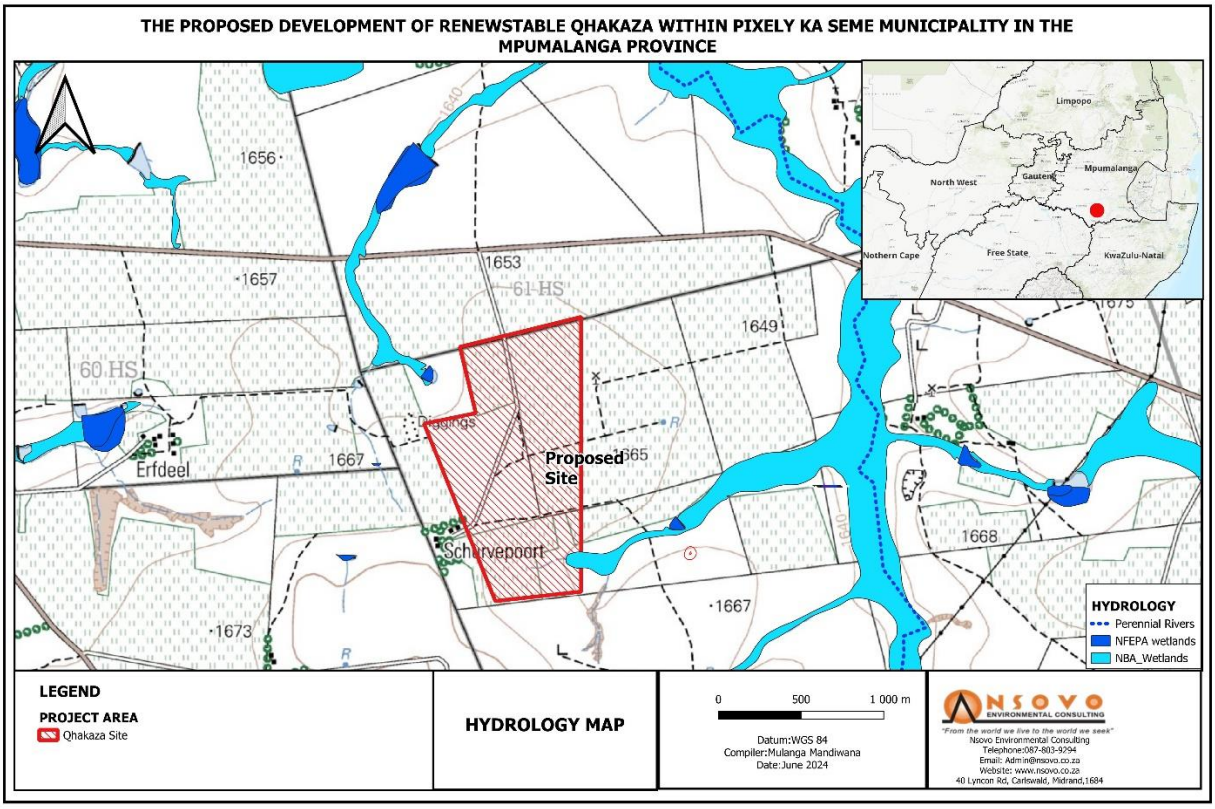


Figure 20: Hydrological map of the proposed location

10.1.7 TOPOGRAPHY

Renewstable® Qhakaza border Renewstable Ntokozo, the study area is characterised by elevation ranging from 1660 mamsl to 1680 mamsl. Southwest of the property has a high elevation of 1740 mamsl, which decreases to an elevation that varies from 1680 mamsl in the southern boundary to 1660 mamsl in the northern boundary.

10.1.8 GEOHYDROLOGY

The study area is characterised by dolerite intrusion. Weathered rocks and soil material characterise the aquifer, which comprises soil and weathered rocks in the 5 to 15 m upper. In some areas of the aquifer, the occurrence of dolerite near the surface is evident (Vermeulen and Usher, 2006).

Groundwater movement within this aquifer mimics topography and generally flows toward the surface slope. Seepage of groundwater in the form of fountains is common, especially where the flowing groundwater encounters a barrier such as dolerite dykes, paleo topographic highs in the bedrock, or where the surface topography cuts into the groundwater level at streams (Vermeulen and Usher, 2006).

The weathered shallow aquifer is characterised by excellent water quality. This is due to rapid recharge and dynamic groundwater flow within the aquifer. Groundwater flow through the aquifer for many years has resulted in flushing leachable salt in the aquifer. However, flowing groundwater dissolves salts along the flow path due to clay particles that slowly decompose (Hodgson and Krantz, 1998).

10.1.8.1 Hydrocensus survey

A detailed hydro census was conducted within a radius of 1 km of the proposed facilities to obtain a representative population of the boreholes in the area. During the survey, all available borehole information was collected and recorded. Information collected during the survey is summarised below, Table 25 and Figure 21.

Table 25: Hydrocensus survey data.

Qhakaza						
Name	Latitude	Longitude	Farm Name	Water level	Status	Purpose
HD1	-27.04771	29.930772	Schurvepoort portion 63	-	Equipped with Solar power, operational	Used for domestic and livestock watering
HD2	-27.04733	29.931229	Schurvepoort portion 63	-	Non-operational, equipped, solar power	Used for domestic and livestock watering
HD3	-27.04941	29.930049	Schurvepoort portion 63	-	Non-operational wind pump	Used for domestic and livestock watering
HD4	-27.04899	29.932174	Schurvepoort portion 63	-	Non-operational wind pump	Used for domestic and livestock watering

Four boreholes have been identified in the vicinity of the proposed plants. These boreholes are inside Schurvepoort Portion 63 but outside the farm portion where development will occur. The water level was measured as two mbgl in one borehole equipped with a dismantled wind pump.

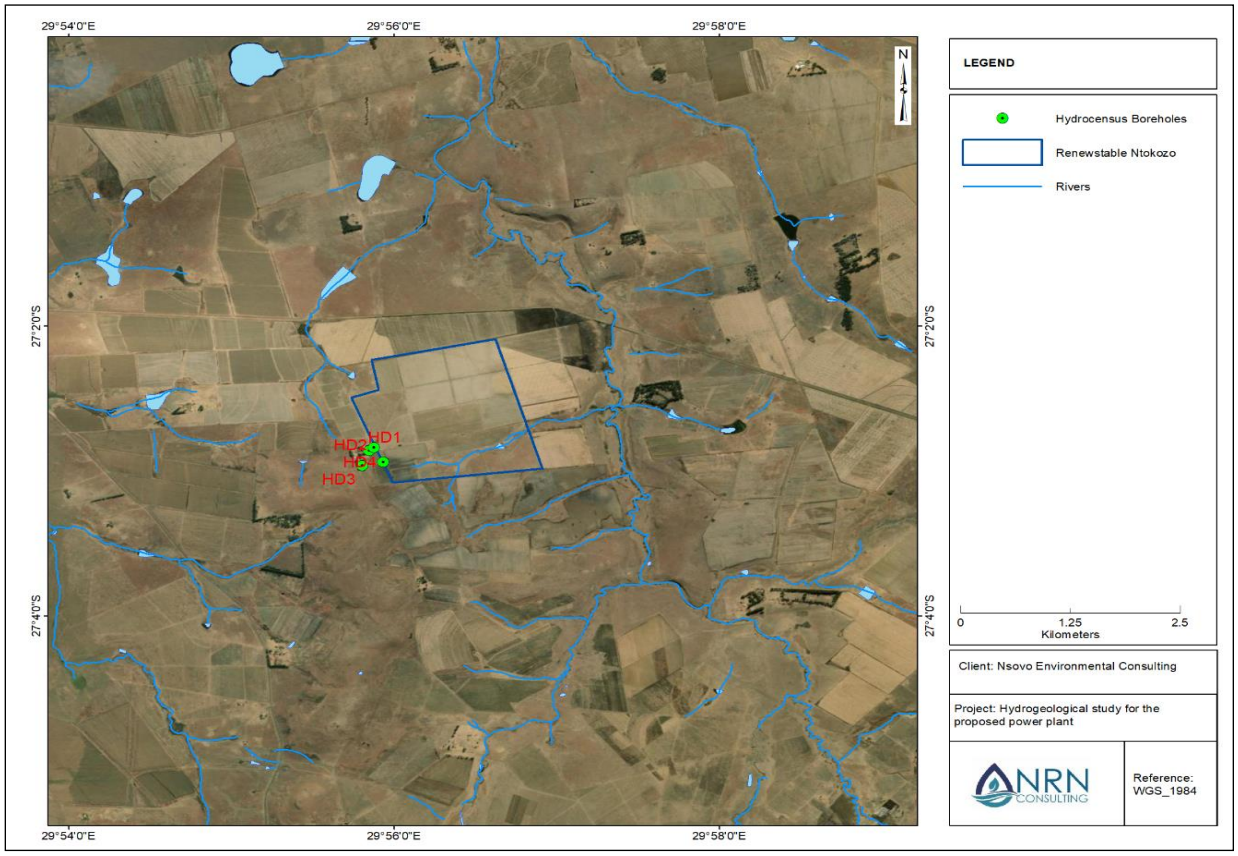


Figure 21: Distribution of boreholes within Renewstable ®Qhakaza and Ntokozo

10.1.8.2 Groundwater recharge

The estimated recharge for the study area ranges from 3.8% to 5% of the annual rainfall, with an average of 4.49%. This translates to a 35.61 mm recharge per annum. The study area falls under the C11E quaternary drainage region. According to the Department of Water Affairs and Forestry (DWAF, 2005), this quaternary catchment has a groundwater recharge of 35.10 mm/a.

Table 26: Groundwater recharge calculations.

Name of Expert	% Recharge	Recharge (mm/a)	Weight (1 - 5)
Soil information	5.0	39.64	4
Geology	3.8	30.12	2
Vegter	4.0	32.00	3
Acru	4.4	35.00	3
Harvest Potential	4.7	37.50	4
Average =	**4.49**	**35.61**	

10.1.9 VEGETATION STRUCTURE AND COMPOSITION

The study area falls within the Grassland Biome, as Mucina and Rutherford (2012) described. The Grassland Biome covers a third of the country, occurs across six provinces, and is the second largest of South Africa's nine biomes, covering an area of 339 237.68 km^2 (SANBI, 2012).

The study area corresponds with Amersfoort Highveld Clay Grasslands to the Grassland Biome (Figure 22), more generally, the Mesic Highveld Grassland defined by Mucina and Rutherford (2006). This unit is found in the eastern, precipitation-rich regions of the Highveld. According to SANBI (2018), the study area is within the Amersfoort Highveld Clay Grassland vegetation type, which is endemic to South Africa and occurs in KwaZulu-Natal and Mpumalanga Provinces. Amersfoort Highveld Clay Grassland consists of undulating grassland plains with scattered patches of dolerite outcrops. The grassland is characteristically short and closed, dominated by *Themeda triandra* and is often severely grazed (Mucina and Rutherford, 2006; SANBI, 2021). Amersfoort Highveld Clay Grassland is classified as Least Concern, with a target of 27%, only 3.6% is statutorily conserved, with around 45% transformed mainly for agriculture (Mucina and Rutherford, 2006; SANBI, 2021; DFFE, 2022).

The grasslands of these parts are regarded as ‘sour grasslands. The area is composed of an ecological type known as the Amersfoort Highveld Clay Grassland. This grassland comprises undulating plains with small, scattered patches of dolerite outcrops. The vegetation comprises short, closed grassland, primarily dominated by a dense *Themeda triandra* sward, often severely grazed.

Thirty percent (30%) of the biome has been irreversibly transformed, and only 1,9% is formally conserved. As a result, the National Biodiversity Strategy and Action Plan has identified the grassland biome as one of the spatial priorities for conservation action (SANBI, 2012). The important biodiversity contained within the grasslands, which underpins life, is being eroded to such an extent that human well-being is threatened.

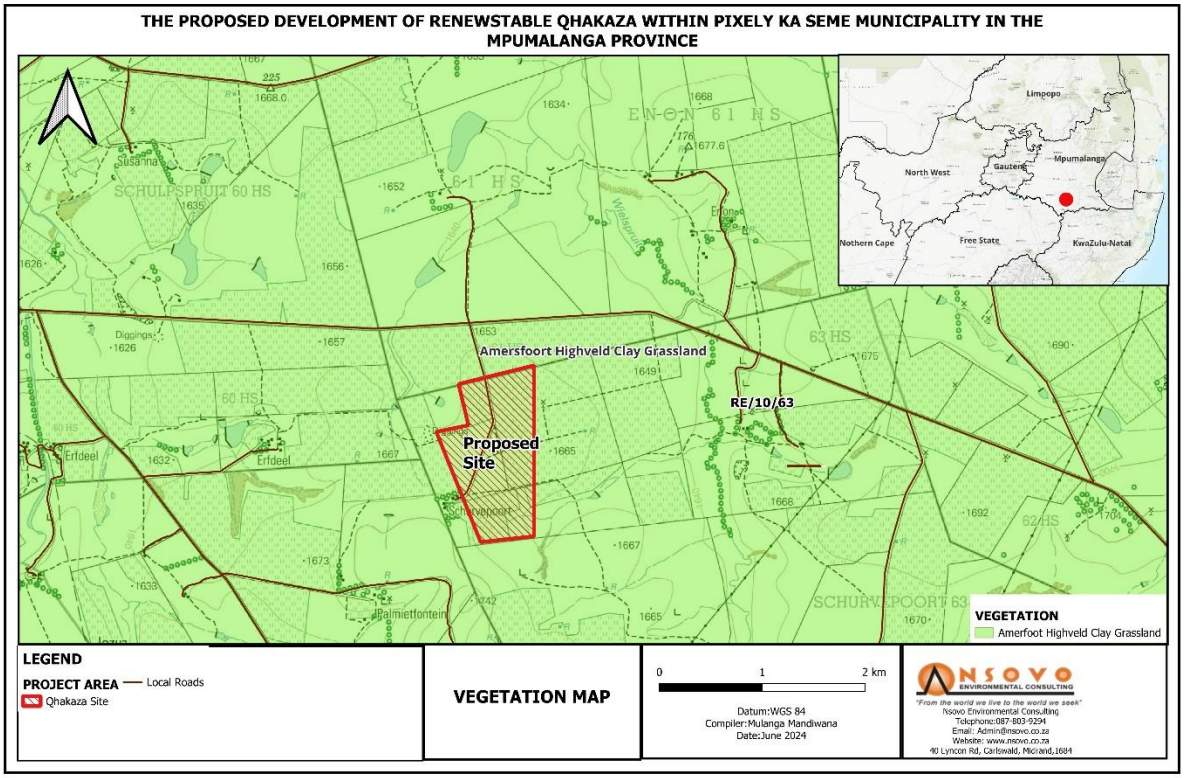


Figure 22: Vegetation Map

Most of the study area (162 ha) had transformed due to the cultivation of maize and soybeans. Livestock were also observed throughout most of the site, and evidence of grazing was recorded in grassland areas, showing a dominance of increased species and some erosion. Despite these impacts, areas left intact showed a high diversity of grasses and forbs, particularly members of the Asteraceae family and the Helichrysum genus. Furthermore, the areas kept intact are classified as critical biodiversity areas, as depicted in Figure 23.

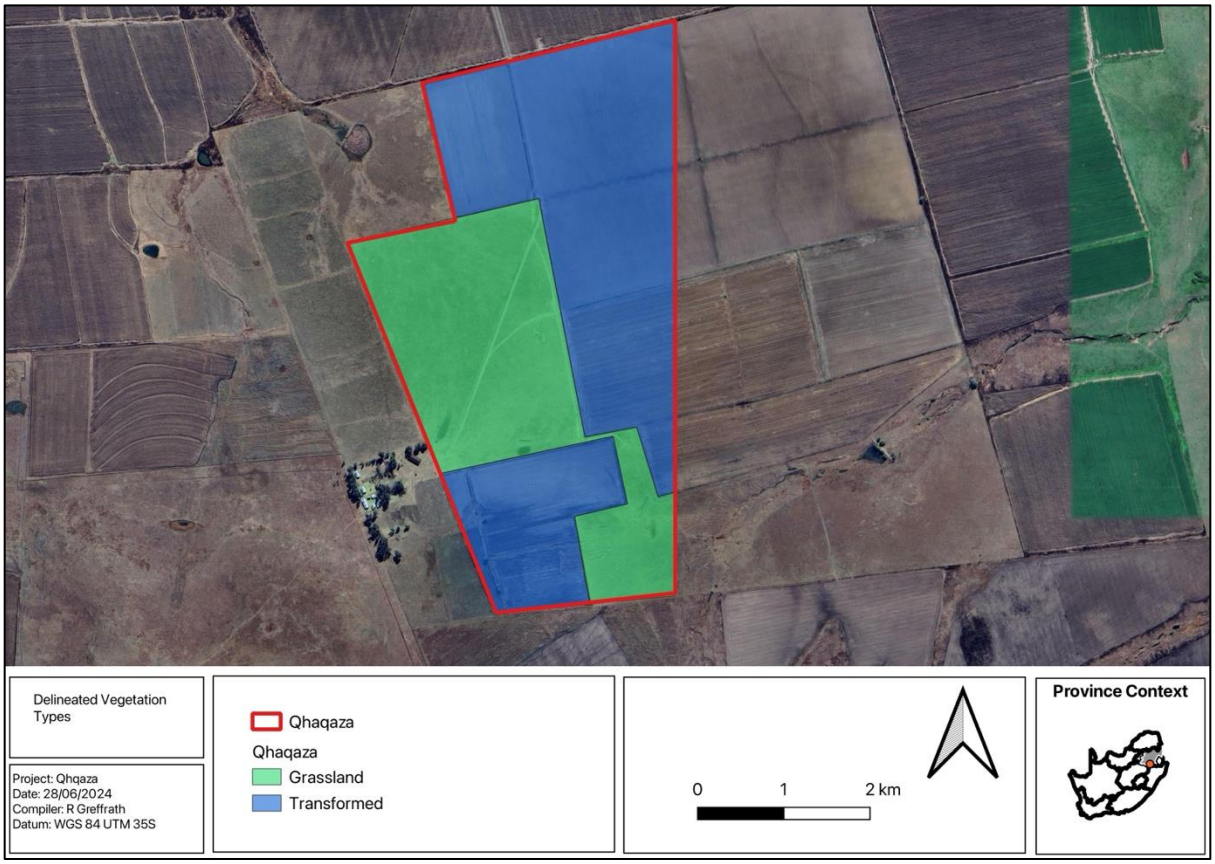
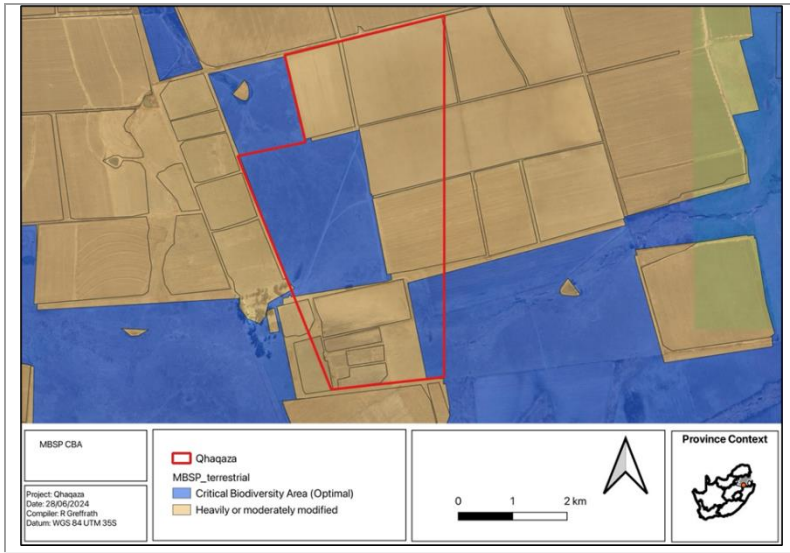
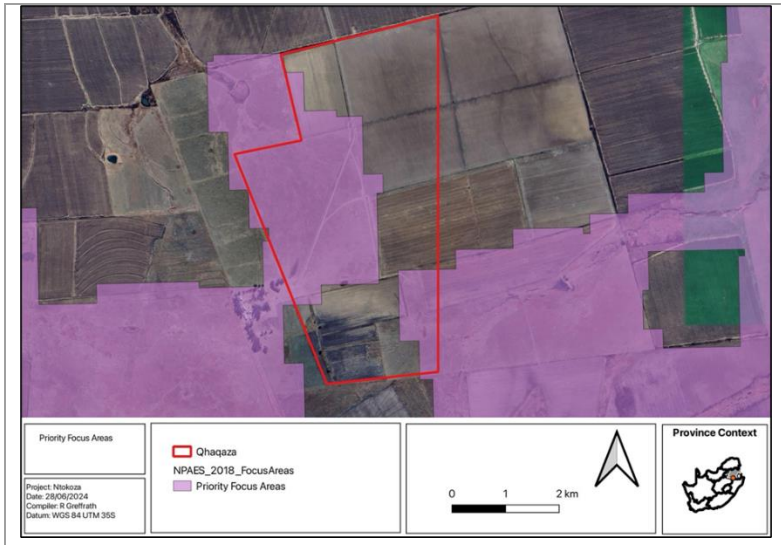
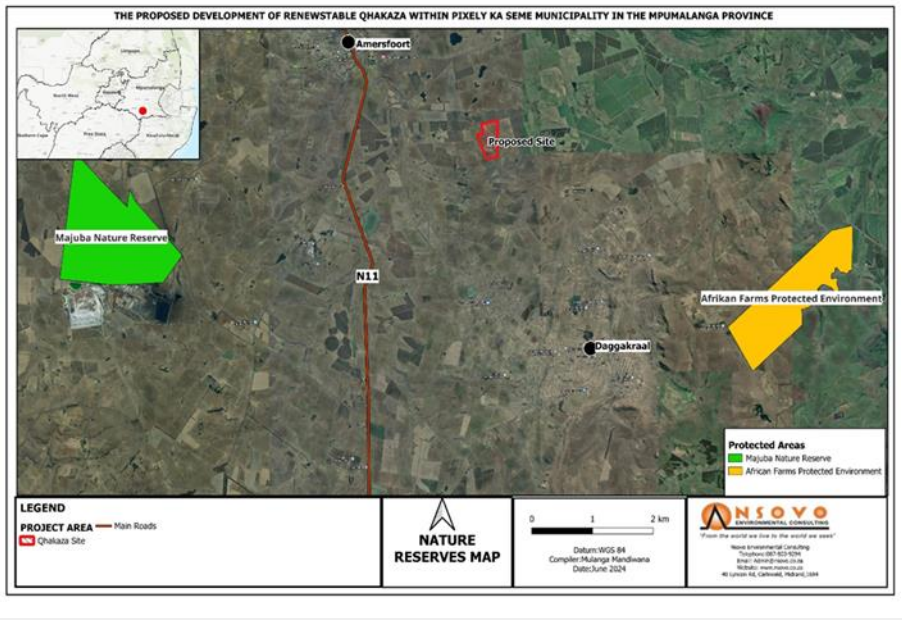


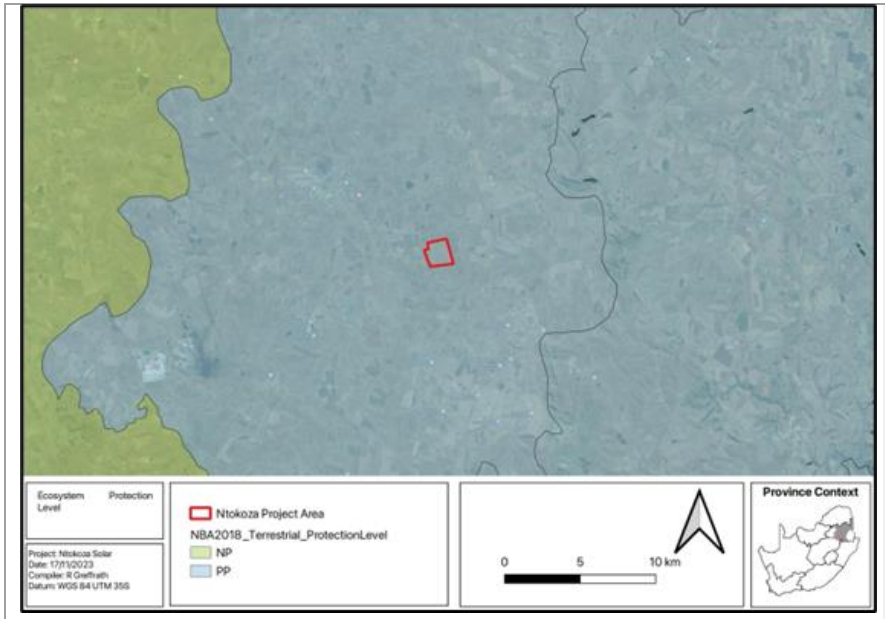
Figure 23: Delineated Vegetation types encountered within the Renewstable Qhakaza project area (AES, 2024).

Table 27: Summary of Regional Sensitivity and No-go Areas (AES, 2024)

	
Mpumalanga Biodiversity Sector Plan (MBSP) (2013) The primary purpose of a biodiversity sector plan is to ensure that the most recent and best quality spatial biodiversity information can be accessed and used to inform land-use and development planning, environmental assessments and authorisations, and natural resource management. The CBA Optimal areas (previously called Important & Necessary in the MBCP) represent the best localities optimally located to meet biodiversity targets and satisfy other criteria. These areas have an irreplaceability (or frequency selection score) of less than 80%, categorised as the "Best" solution. It is the most spatially efficient and, therefore, the optimal solution for meeting biodiversity targets while avoiding high-cost areas. According to the Mpumalanga Biodiversity Sector Plan (MTPA, 2019), most of the site (mostly cultivated fields) is classified as "Heavily Modified". The block of natural grassland	**The National Protected Areas Expansion Strategy (NPAES)** These are areas designated for future incorporation into existing protected areas (national and informal protected areas). They are large, primarily intact areas required to meet biodiversity targets and suitable for protection. They may not necessarily be proclaimed as protected areas in the future, but they are a broad-scale planning tool for better development and conservation planning. The CBA areas within the project area correspond with NPAES. The Majuba Nature Reserve occurs ~14.5 km southwest of the Qhakaza site, and the Afrikan Farms Protected Environment occurs ~13 km southeast.

on the west side and a small section associated with a natural drainage line in the south-eastern corner are classified as Critical Biodiversity Area (CBA) Irreplaceable.





Protected Areas

Chapter 2 of the National Environmental Management: Protected Areas Act, 2003, sets out the "System of Protected Areas" and the types of conservation areas currently included in the database. Officially protected areas, either provincially or nationally that occur near the project site could have consequences for these areas. However, there are no protected areas in proximity to the project area.

Ecosystem Protection Level

Ecosystem protection level tells us whether ecosystems are adequately protected or under-protected. Ecosystem types are categorised as not protected (NP), poorly protected (PP), moderately protected (MP), or well protected based on the proportion of each ecosystem type within a protected area recognised in the Protected Areas Act (Skowno et al., 2019). Based on this, the terrestrial ecosystems associated with the project area are rated as Poorly Protected (PP). This means these ecosystems are considered not adequately protected in areas such as national parks or other formally protected areas.

10.1.10 Terrestrial Biodiversity Theme and Site Sensitivity Verification

The moist bushveld and rocky bushveld vegetation units were allocated a medium sensitivity since they are considered important habitats that should be conserved due to the likely presence of plant SCC and habitat diversity and functionality. Furthermore, the riparian delineations were assigned high ecological sensitivity due to their suitable habitat for SCC and species diversity.

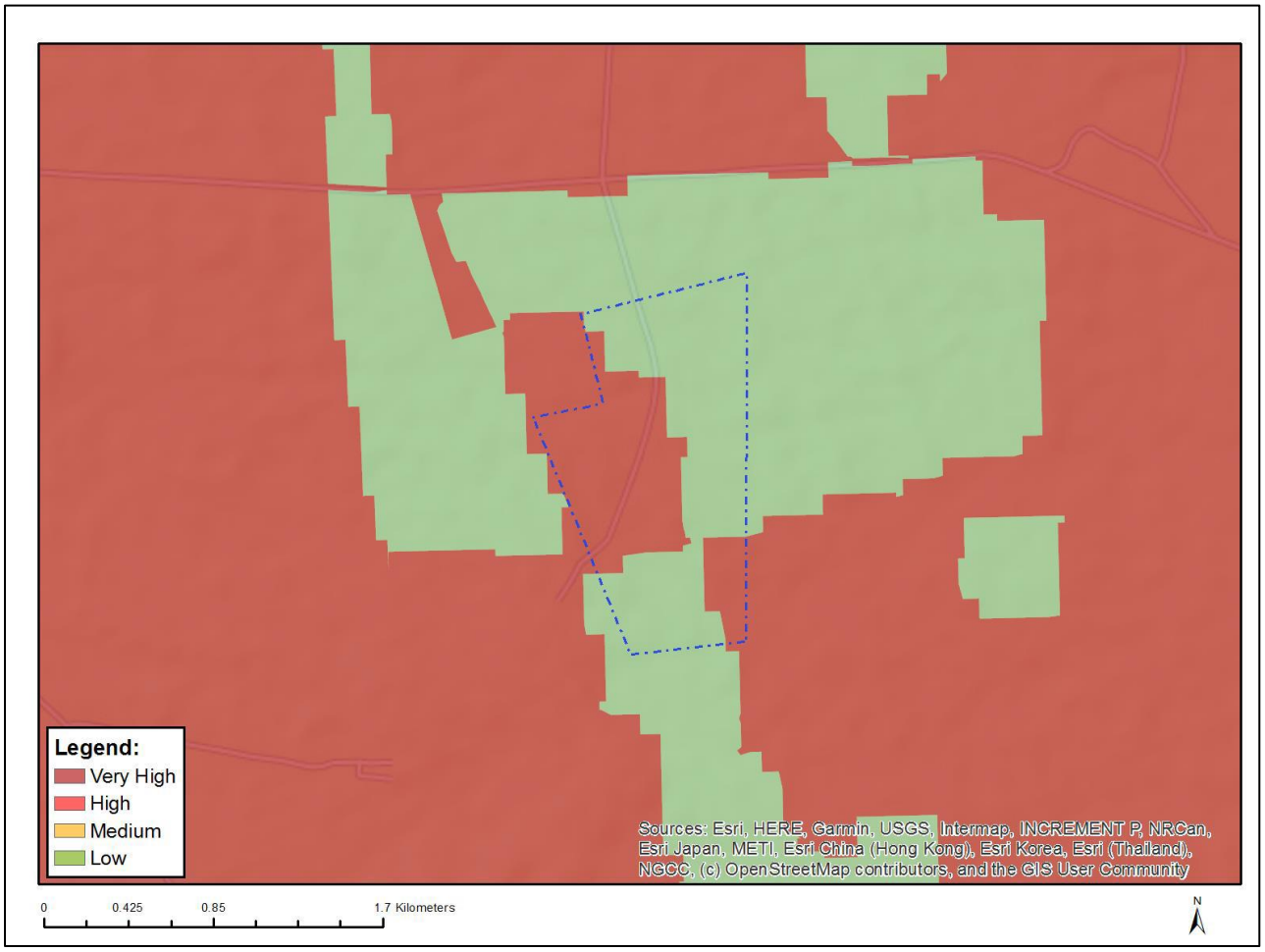


Figure 24: Map of Relative Terrestrial Biodiversity Theme Sensitivity (DFFE Screening Tool, 2023)

The high-sensitivity terrestrial areas identified include

- Occur within a CBA Optimal;
- Overlaps an Aquatic ESA;
- Possibly supports and protects threatened fauna and flora; and
- Support various organisms and may play a more critical role in the ecosystem if left to recover from the superficial impacts.

Completing the terrestrial biodiversity assessment confirmed the high sensitivity of certain parts of the project area, corroborating the screening report regarding natural areas and grasslands. According to the DFFE Screening Tool, the combined terrestrial biodiversity theme sensitivity is Very High. The Site Sensitivity Verification indicated the site to be of High sensitivity.

Table 28: Terrestrial Sensitivity Screening Tool Vs Specialist SSV Outcomes (AES, 2024)

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Terrestrial	DFFE Screening Tool	SSV Outcomes		
Disputed – Certain habitat sensitivities are regarded as high sensitivity due to the role of this intact habitat to biodiversity within an area. Medium and Low sensitive areas were also delineated. Very high sensitive CBA2 and NPAES areas are present.				

10.1 Plant Theme Site Sensitivity Verification

The specialist report (AES,2024) confirmed that 149 plant species were recorded during the various site investigations. Typical of the Grassland Biome, the physiognomic dominance of the herbaceous component in the form of forb and grass species is evident. Trees are present as low shrubs or as stands of exotics. The species composition of untransformed grasslands represents the principal regional vegetation type.

The picture below presents the vegetation transformed and grassland vegetation types.

Wet grassland south of the farmhouse

Agricultural Areas

No threatened species were identified within the site. However, SANBI records for the region and survey results indicate that eight flora species of conservation importance and provincially protected species were recorded on or close to the study area (Mpumalanga Nature Conservation Act, Act No. 10 of 1998). The specialist confirmed the presence of the following

- ***Crinum bulbispermum*** species was located within a wetland channel area, multiple individuals were located, and this area was not affected by fire. This wetland area is upstream of the project area and the possibility of these species occurring on site is high.
- The single ***Eucomus autumnalis*** species individual was in a burnt grassland, as it was re-emerging, it can therefore be assumed more individuals could be present.
- ***Boophone disticha***

Boophone disticha

Crinum bulbispermum

10.1.10.1 Alien Plants

A total of 18 alien plant species (AIP) were recorded on site); three of these have been assigned alien plant categories according to CARA and NEMBA.

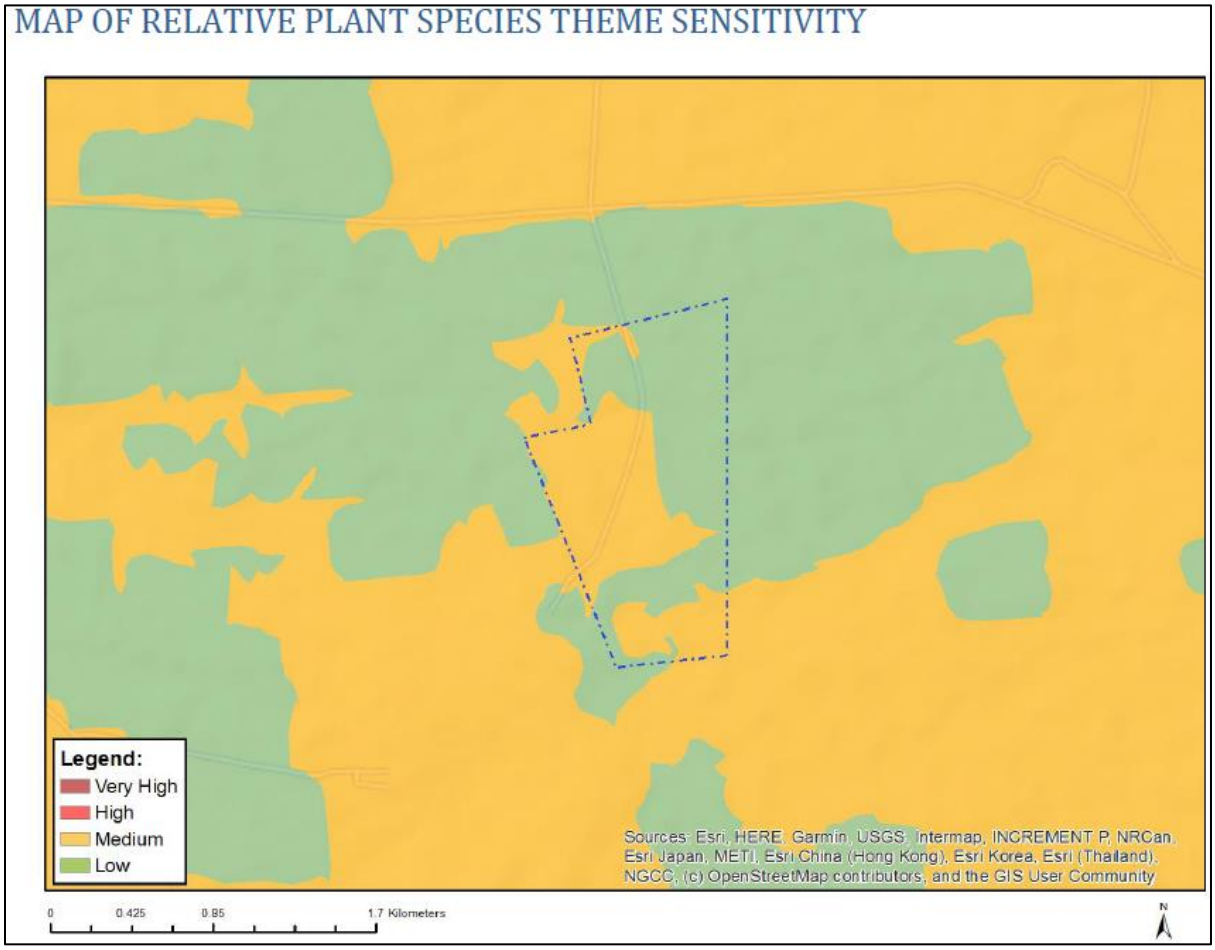


Figure 25: Map of relative plant species theme (DFFE Screening Report, 2024)

Table 29: Relative Plant Species Sensitivity Screening Tool Vs Specialist SSV Outcomes (AES, 2024)

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Plant Species			DFFE Screening Tool SSV Outcomes	
Validated - The composition, moderate species diversity, and number of plant species recorded, including the protected species. The landscape is fragmented.				

10.1.11 ANIMAL THEME

The specialist indicated that actual sightings, spoor, calls, dung and nesting sites, as well as active sampling using motion detection cameras and Sherman traps, were used to establish the presence of mammals on the proposed project site. The evidence of dung and spoor suggests that animals were present in the area, although relatively few

were recorded during the surveys. According to the Screening tool the following species have a medium sensitivity and could be expected to occur on site

- *Chrysospalax villosus,*
- *Crocidura maquassiensis,*
- *Hydrictis maculicollis and*
- *Ourebia ourebi ourebi.*

None of these species were recorded during the site visit.

10.1.11.1 Herpetofauna

According to the Southern African Reptile Conservation Assessment (SARCA), 17 reptile species have been confirmed to occur within QDGC 2728BB. This includes the Red Data species Sungazer lizard (*Cordylus giganteus*, VU), previously recorded during the site investigations and known to occur in several localities in the region (AES, 2024). Following engagements with MTPA, A Specialist Herpetofauna (Appendix C-9) study was conducted to supplement the attached Biodiversity Report.

Table 30: Relative Plant Species Sensitivity Screening Tool Vs Specialist SSV Outcomes (AES, 2024)

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Plant Species		DFFE Screening Tool	SSV Outcomes	
Disputed – Habitat is generally intact, but fragmented, transformed areas are present, and SCC is possible. SCC may forage in specific areas				

10.1.12 WETLAND AND AQUATIC

According to Nel et al. (2011), the study area falls within the Mesic Highveld Grassland Group 8 wetland vegetation group. According to Macfarlane et al. (2014), this group is regarded as Least Threatened (Macfarlane et al., 2014).

Two separate hydro-geomorphic units (HGM13 and HGM 14), comprising one HGM type, a channelled valley bottom wetland, were delineated and classified within the study area and 500m surrounding it (see Figure below).

Wetlands within the study area improve habitat within and potentially downstream of the study area by providing various ecosystem services. Many of these functional benefits, therefore, contribute directly or indirectly to increased biodiversity within the study area and downstream of the study area through the provision and maintenance of appropriate habitat and associated ecological processes.

Combined area-weighted Wet-Health results indicated that the wetlands in the study area had been moderately impacted in most instances because of changes in water inputs (derived from its catchment) and water retention and distribution patterns within the wetlands units. Vegetation changes within the wetlands and surrounding catchments due to historical and current anthropogenic impacts have also affected the wetlands, albeit relatively limited.

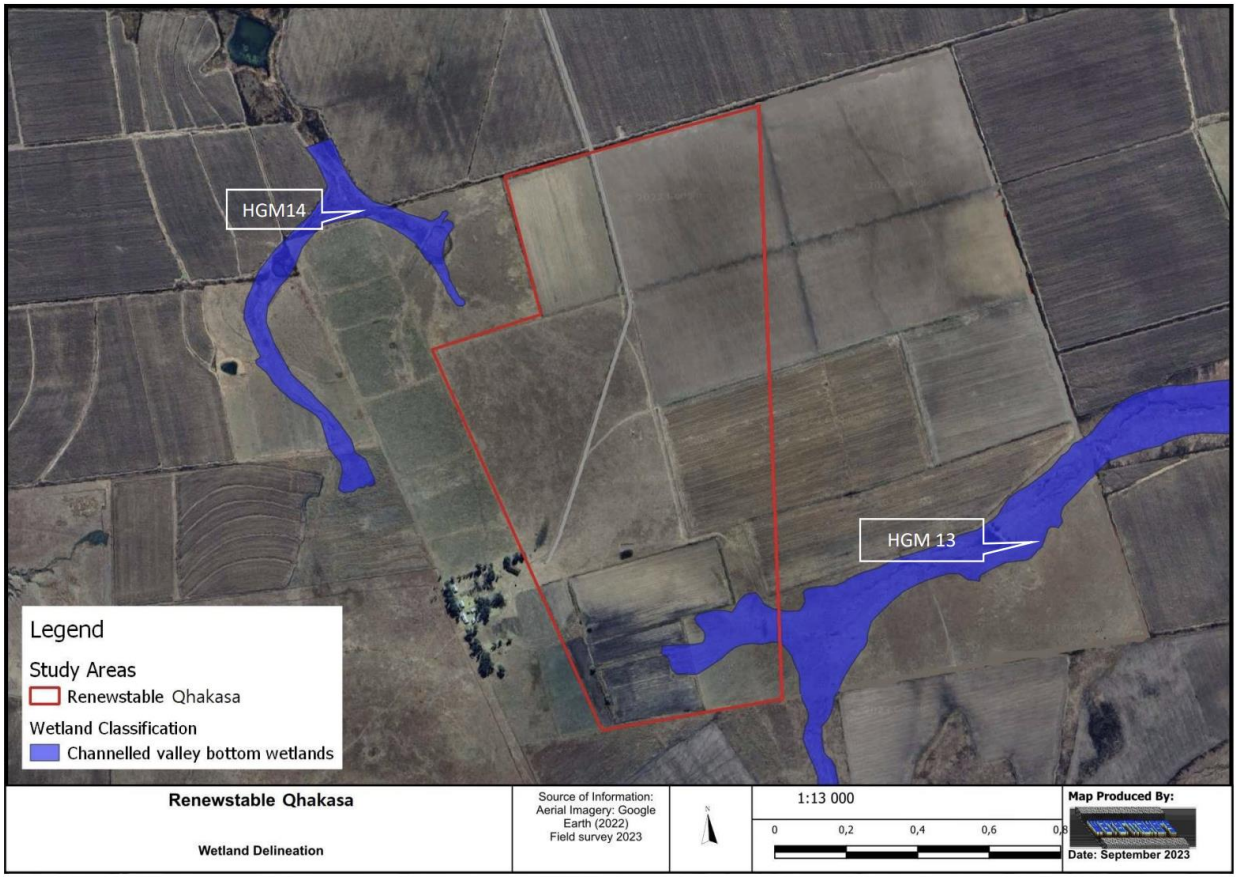


Figure 26: Delineated wetlands within the study area and within 500m (WaterMakers, 2024)

10.1.12.1 Functional and Present Ecological State Assessment

Due to the nature of historic and current land uses within the catchment, species composition within the wetlands is expected to have changed relative to the perceived natural condition of the wetlands. The channelled valley bottom wetlands (HGM 13 and HGM 14) received their highest ecosystem services scores from the Wet-EcoServices assessment for flood attenuation, sediment trapping, erosion control, maintenance of biodiversity, carbon storage and the provision of natural resources. The relatively relaxed gradient associated with several sections of these valley bottom wetlands would allow for high levels of sediment deposition. Based on the assessment of the individual drivers of the wetlands, the Present Ecological State for HGM 13 and HGM 14 were determined to be representative of **Category C**.

Historical and current impacts on the wetland, combined with land use changes in the surrounding catchment, resulted in geomorphological, hydrological, and vegetation changes within the valley bottom wetlands. Impact on the hydrology of the valley bottom wetlands included evidence of topographical manipulation and channel formation within most reaches of the watercourses.

10.1.12.2 Ecological Importance and Sensitivity

The valley bottom wetlands were regarded as having a **high** Hydrological and Functional Importance due to the relatively intact nature of the watercourses and the various important ecosystem services they provide. Direct human benefits were associated with providing natural resources and grazing opportunities afforded by most wetlands within the study area. The valley bottom systems collectively play an important role in contributing to good water quality and quantity in the downstream environment.

10.1.12.3 Freshwater Ecosystem Buffers

WaterMakers (2024) emphasised that the determination of preliminary buffer requirements for riparian features associated with the proposed study area followed the approach of Macfarlane & Bredin (2016), whereby the preliminary required buffers were developed based on various factors, including assumed agricultural impacts, slope, annual precipitation, rainfall intensity, channel width, catchment to wetland ratio, etc. Accordingly, conservative preliminary buffer requirements for the identified wetland habitat were determined to be **between 29m to 35m** from the edge of the watercourses for the majority of the site as presented below.

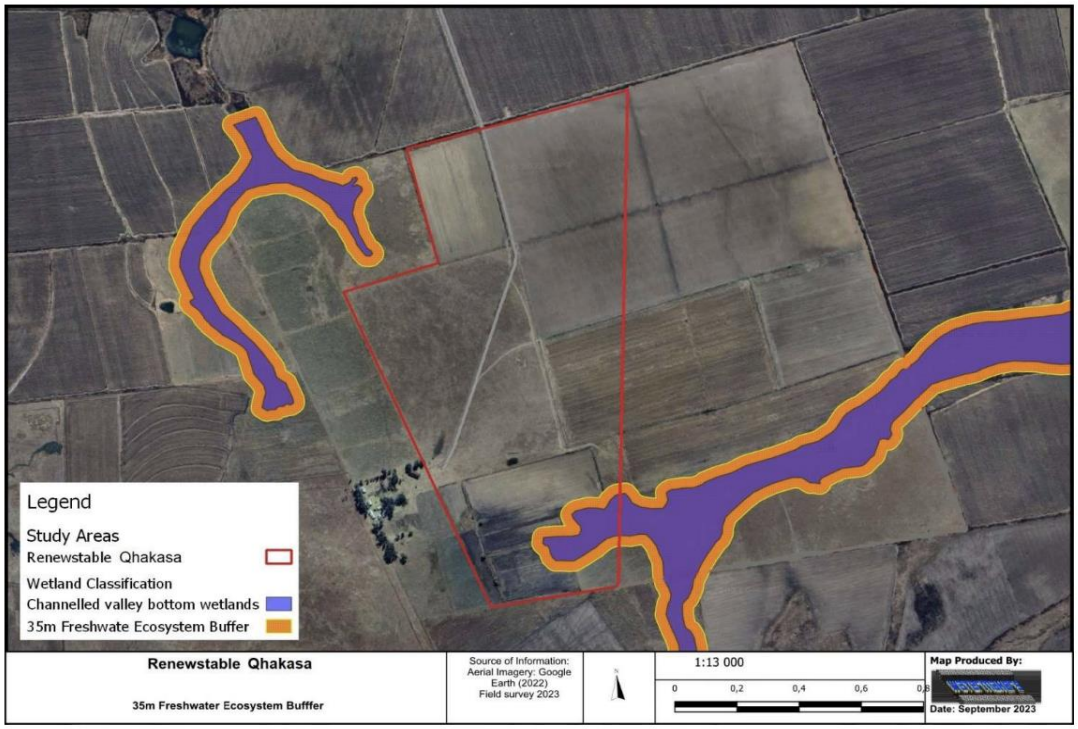


Figure 27: 35m Freshwater Ecosystem Buffer map (Watermakers,2024)

10.1.12.4 Screening Tool

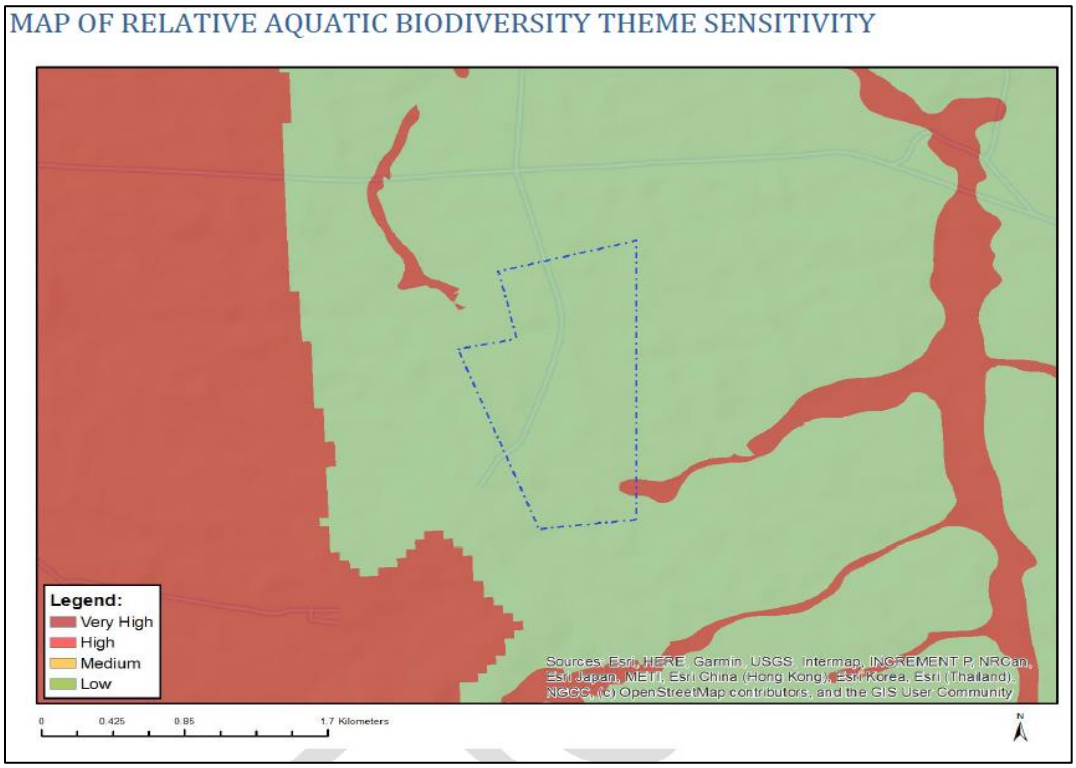


Figure 28: Map of relative aquatic Sensitivity theme

The system has been developed to provide a scoring approach for assessing the ecological and hydrological functions and direct human benefits of the importance and sensitivity of wetlands. These scoring assessments for these three aspects of wetland importance and sensitivity have been based on the requirements of the NWA, the original Ecological Importance and Sensitivity assessments developed for riverine evaluations, and the work conducted by Kotze et al. (2008) on the assessment of wetland ecological goods and services from the WET-EcoServices tool (Rountree et al., 2013). It must be noted that the earlier assessment created legislated buffers to inform the layout design of the plant, which significantly reduced the impact. The assessment outcome is low (See the risk rating attached to the Wetland Assessment by WaterMakers in Appendix A and the full report attached in **Appendix C3**.

The outcomes of the Site sensitivity verification vs the specialist outcomes are presented in Table 31.

Table 31: Relative Wetland and Aquatics Sensitivity Screening Tool Vs Specialist SSV Outcomes

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Renewstable Qhakaza		DFFE Screening Tool		SSV Outcomes

10.1.13 AGRICULTURAL ASSESSMENT

The study area is within a subtropical highland climate or Monsoon-influenced temperate oceanic climate. This climate is characterised by cold, dry winters and warm, wet summers. The summers experience heavy precipitation, due to the presence of unstable humid air masses that encourage thunderstorm development. The mean annual rainfall ranges between 601-800 mm, which is considered sufficient to support rainfed agriculture. However, it is essential to carefully consider the planting dates and the length of the growing season, as they may be affected.

Based on the observations during the site assessment, the dominant soils within the study area are Mispah/Glenrosa, Mispah/Grabouw and Katspruit (associated with the watercourse). The majority of the soils occurring within the study area do not meet the conditions for agricultural suitability to a certain extent, and these conditions include:

- Adequate depth (greater than 60 cm) to accommodate root development for the majority of cultivated crops;
- Good structure, as in water-stable aggregates, which allows for root penetration and water retention;
- Sufficient distribution of high-quality and potential soils within the study area to constitute a viable economic management unit; and
- Good climatic conditions, such as sufficient rainfall and sunlight, increase crop variety.

However, based on site observations, the soils were tilled to break the plough layer and make them more productive. Table 32 depicts the summary findings of the soils identified within the study area and their respective land capability and agricultural potential status.

Table 32: Summary findings within the study area.

Renewstable Qhakaza Study Area				
Soil Forms	**Area (Ha)**	**Percentage (%)**	**Land Capability**	**Agricultural Potential**
Glenrosa/Grabouw	72.30	52.2	Arable (Class IV)	Moderate
Katspruit	0.56	0.5	Watercourse (Class V)	Very Low
Mispah/Glenrosa	43.43	37.3	Grazing (Class VI)	Low
Total Enclosed	**116.29**	**100**		

The development footprint presents areas of active pasture utilised for grazing purposes, and some grass is harvested and used for stall feeding. These areas are critical for livestock farming in the study area and are regarded as important from an agricultural point of view. According to the desk-based assessment (i.e., sourced from the Natural Agricultural Resource Atlas of South Africa database), the grazing capacity for this area is 4 Hectares per livestock unit, which is considered adequate for large-scale farming. It was also evident during the site verification that the grazing land was utilised for fodder, which means that these areas are actively used for large-scale purposes. As such, this presents a constraint for this project.

The loss of agricultural soils and the long-term change in land use will be localised within the study area. The integrated mitigation measures must be implemented accordingly to minimise the potential loss of these valuable soils, considering the need for sustainable development.

Although the loss of agricultural soils and the permanent change in land use will be localised within the study area, the cumulative loss of agricultural resources locally and regionally is moderate without mitigation and low with mitigation measures. It is the opinion of the specialist that the unmitigated scenario poses a threat to the sustainability of high-potential agricultural soils. Therefore, integrated mitigation measures must be implemented accordingly to minimise the potential loss of these valuable soils, considering the need for sustainable development. Mixed land use, such as sheep grazing between solar arrays, should be regarded as to retain agricultural production while generating renewable energy.

The screening tool analysis was conducted, which presented the findings as the impact on agricultural resources being of high sensitivity in terms of agricultural potential. Based on the outcomes of the field assessment, this was found to be of a less significant impact as presented on the screening tool due to the dominant soil forms, which are not high-potential agricultural soils due to various limitations, which include shallower depth and requiring intensive management strategies to cultivate on. The land capability of the surrounding soils and the agricultural potential are very low to moderate due to adequate climatic conditions (i.e., rainfall, temperature) and appropriate slope, which allows for intensive commercial agricultural practices.

10.1.13.1 Land Use

The study area was primarily dominated by cultivation activities and livestock farming. Figure 29 depicts the different land uses identified within the study area.

Figure 29: Land uses associated with the study area.

10.1.13.2 Soil and Terrain (SOTER) Dominant Soils

The study area is characterised by *Eutric Planosols*. These soils are characterised by a marked textural differentiation between the top and subsoil horizons. The subsoil horizons are typically clay-enriched compared to the sandier topsoil horizons because of clay illuviation, which causes dense, strongly structured, and slowly permeable subsoil horizons. These soils are prone to waterlogging conditions due to impeded water percolation, and root penetration may be difficult for a wide variety of crops; thus, only suitably adapted crops may be planted. Therefore, it limits the choice of crop to be cultivated. Figure 30 below illustrates the SOTER-dominant soils associated with the study area.

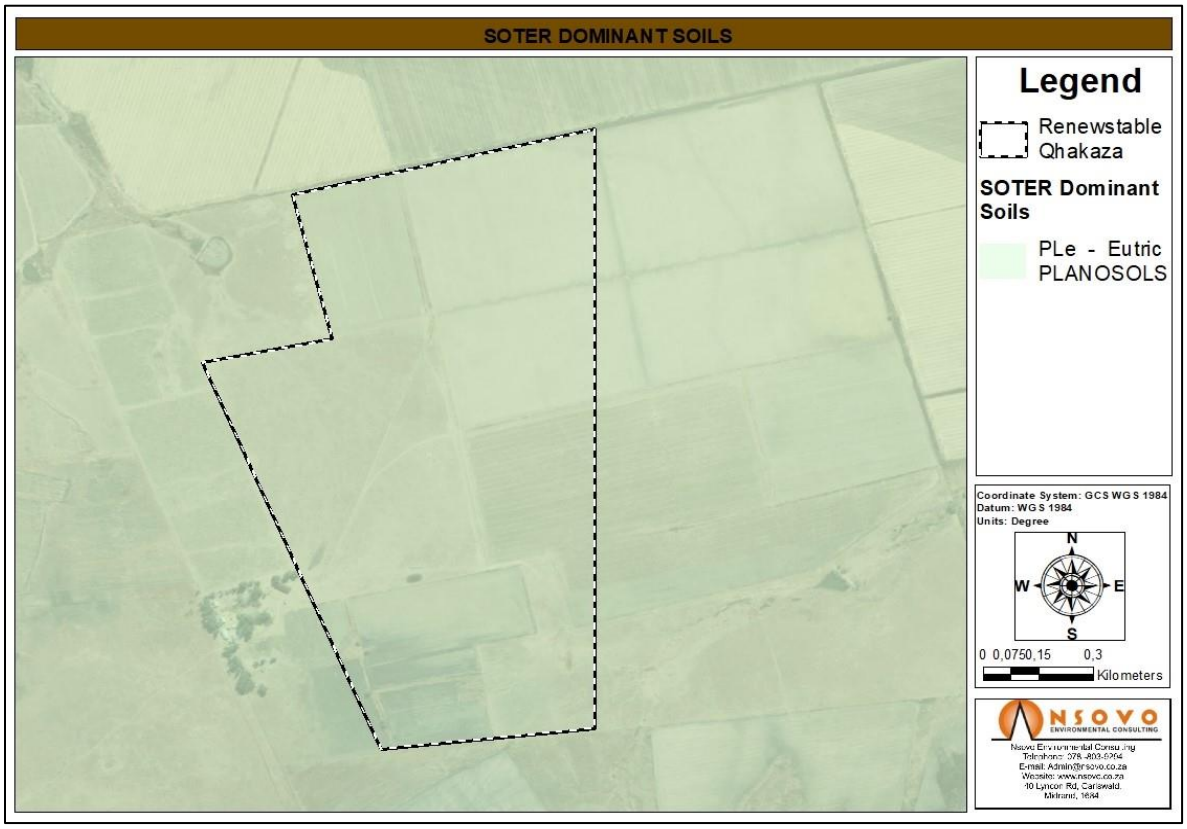


Figure 30: SOTER dominant soils associated with the study area (Nsovo, 2023).

10.1.13.3 Soil Forms

The section below focuses on the identified soil forms within the study area.

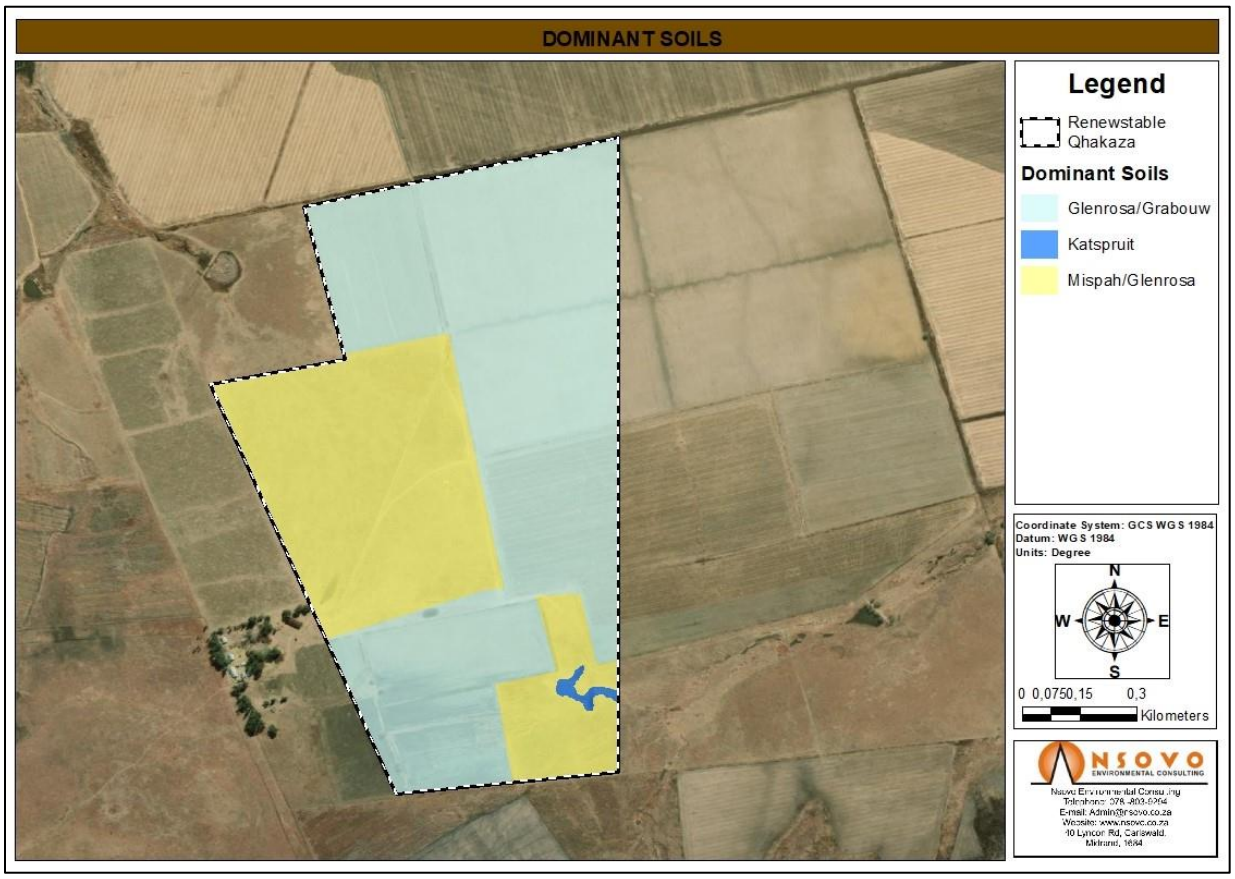


Figure 31 presents the spatial distribution of the identified soil forms within each study area. Table 33 present a summary table depicting the area of coverage of each identified soil form.

Table 33: Soil forms in hectares (ha) occurring within the study area.

Renewstable Qhakaza Study Area				
Soil Forms	Area (Ha)	Percentage (%)	Land Capability	Agricultural Potential
Glenrosa/Grabouw	72.30	52.2	Arable (Class IV)	Moderate
Katspruit	0.56	0.5	Watercourse (Class V)	Very Low
Mispah/Glenrosa	43.43	37.3	Grazing (Class VI)	Low
Total Enclosed	**116.29**	**100**		

Table 34: Land capability (DAFF, 2016) associated with the soils occurring within the study area.

Soil Form	Land Capability Groups	DAFF (2017) Classification
Glenrosa/Grabouw	Arable Land	8. Moderate
Katspruit	Watercourse	5. Low
Mispah/Glenrosa	Grazing Land	6. Low - Moderate

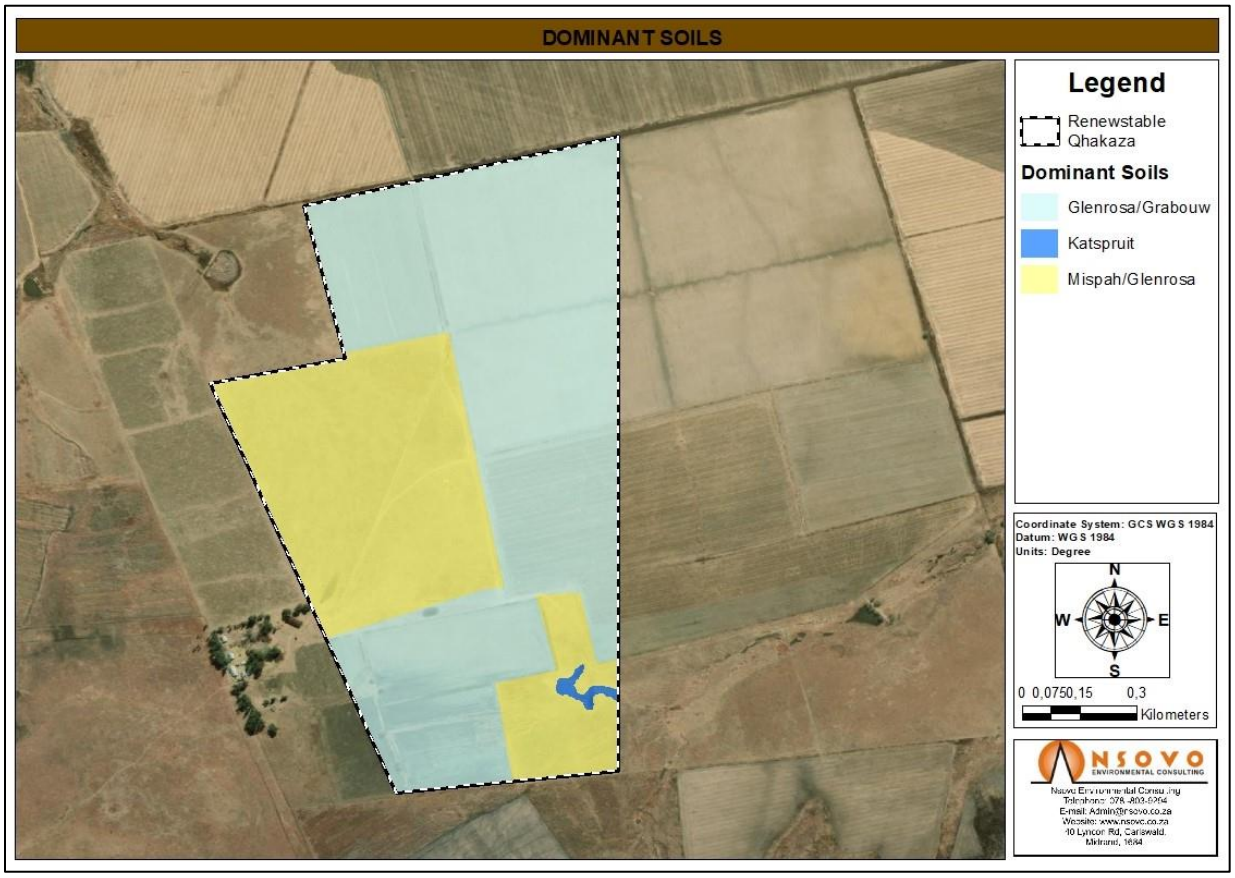


Figure 31: Dominant soils form within the study area.

10.1.13.4 Soil Potential

The soil potential associated with the study area is not suitable for arable agriculture, suitable for forestry, or grazing where climate permits. Figure 32 The soil potential associated with the study area is depicted below.

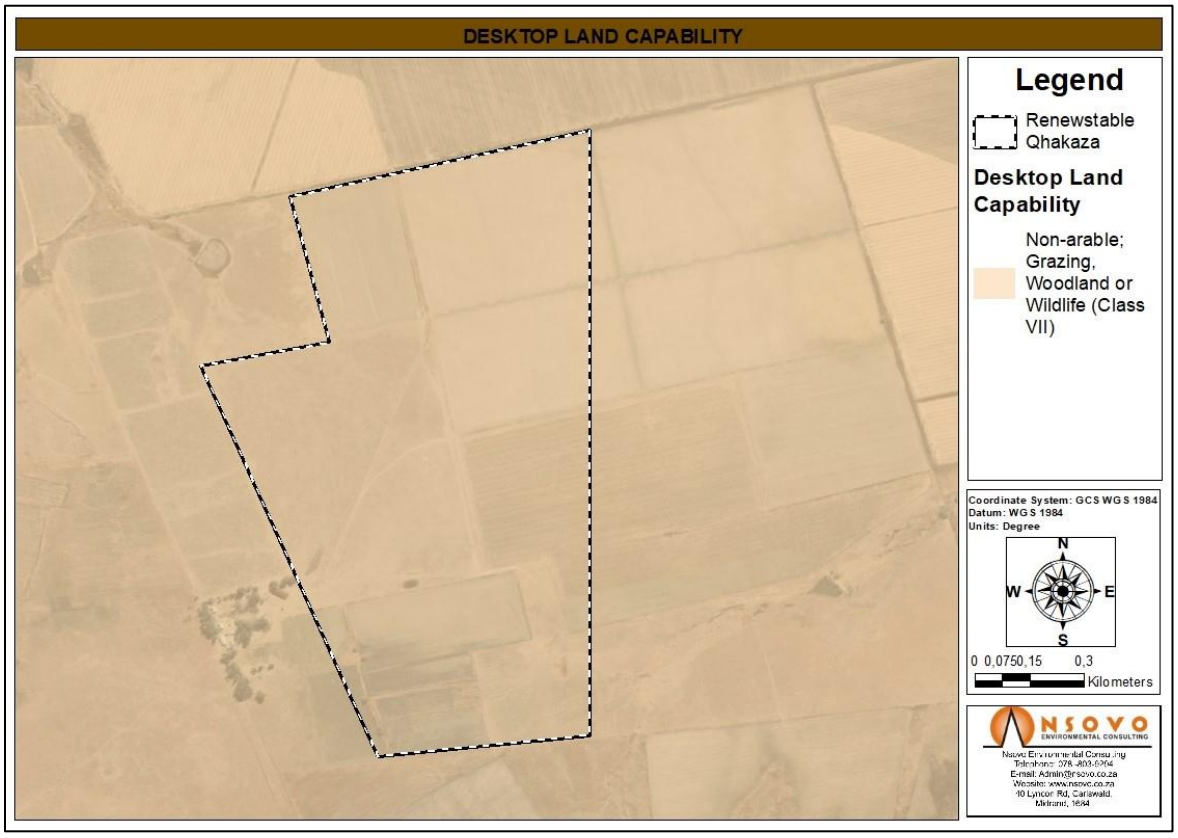


Figure 32: Soil potential associated with the study area (Nsovo, 2024).

10.1.13.5 Gross Agricultural Income from the Study Area

Based on on-site observations, the agricultural specialist indicated that most of the study area was transformed from natural grazing to cultivation through deep in-situ ripping. Thus, the area under which maize cultivation was observed was where the soils of Mispah/Grabouw were observed, which account for 72.30 ha. The potential annual gross income generated from the land was calculated using the long-term maize yields of 4 tons per hectare obtained from the NAR Atlas manual.

Production figures for areas under dryland agriculture:

Cultivated area =72.30 ha

Expected yield = 4 tons/ha

Total yield = 72.30 ha * 4 tons/ha

= 289.2 tons

Price of Maize = R4105/ton

Financial Yield =289.2 * 4105

= R1 187 166 per production season (before input costs are considered)

Thus, it is envisaged that the study area will lose economic yield during the lifespan of the proposed solar facility. However, farming enterprises can generate reliable income by leasing the land to the energy facility. This will likely increase their cash flow and financial security and improve farming operations.

10.1.13.6 Agricultural Theme and Site Sensitivity Verification

The land capability of the surrounding soils and the agricultural potential are very low to moderate due to adequate climatic conditions (i.e., rainfall, temperature) and appropriate slope, which allows for intensive commercial agricultural practices. The screening tool analysis was conducted, which presented the findings as the impact on agricultural resources being of high sensitivity in terms of agricultural potential. Based on the outcomes of the field assessment, this was found to be of a less significant impact as presented on the screening tool due to the dominant soil forms, which are not high-potential agricultural soils due to various limitations, which include shallower depth and requiring intensive management strategies to cultivate on. The land capability of the surrounding soils and the agricultural potential are very low to moderate due to adequate climatic conditions (i.e., rainfall, temperature) and appropriate slope, which allows for intensive commercial agricultural practices. The screening tool and SSV outcomes are presented on the map and in the table below.

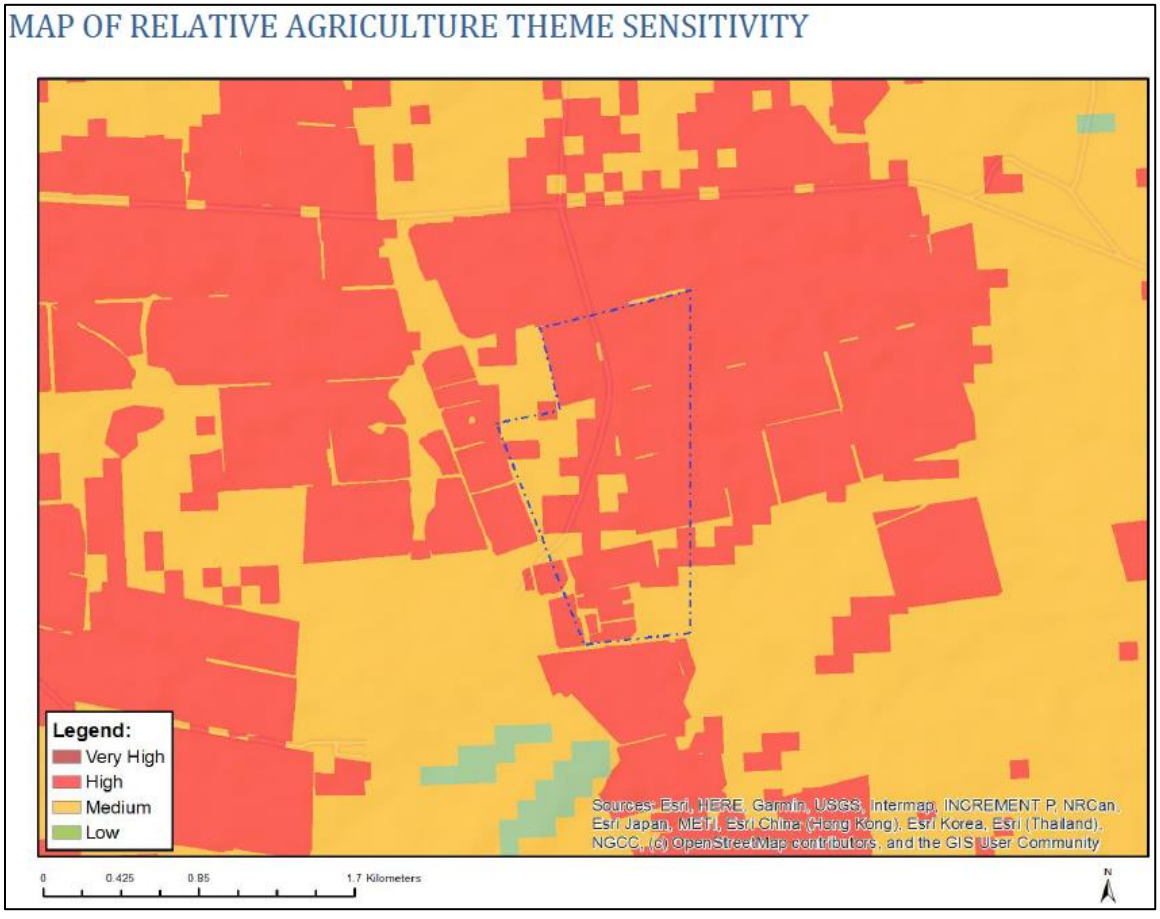


Figure 33: Map of Relative Agriculture Theme Sensitivity (DFFE Screening Tool Report, 2024).

The soils within the study area can generally be classified as low-potential due to their inherent physical properties (insufficient depth), which are generally not ideal for cultivation. The land capability and potential of the surrounding soils are low due to inadequate climatic conditions (e.g., rainfall, temperature), which allow for intensive commercial agricultural practices and the absence of irrigation equipment. However, the site is currently being optimised for agricultural cultivation and cattle grazing despite the limiting soil characteristics.

The screening tool analysis was conducted, which presented the findings as the impact on agricultural resources being highly sensitive in terms of agricultural potential. Based on the outcomes of the sensitivity verification, this was found to have a less significant impact than presented on the screening tool due to the inherent soil characteristics.

Table 35: Relative Agricultural Sensitivity Screening Tool Vs Specialist SSV Outcomes

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture		DFFE Screening Tool	SSV Outcomes	

10.1.14 AVIFAUNA THEME AND SITE SENSITIVITY VERIFICATION

According to the Mpumalanga Biodiversity Sector Plan (MTPA, 2019), most of the site (mainly cultivated fields) is classified as “Heavily Modified”. The block of natural grassland on the west side and a small section associated with a natural drainage line in the south-eastern corner are classified as Critical Biodiversity Area (CBA) Irreplaceable.

The region is relatively high in avifaunal diversity, with around 308 bird species known to occur within the QDGC (an atlas area of 15’ × 15’ – roughly 24 × 27 km) that the study area falls within (2729BB), according to the distribution maps in Roberts VII Multimedia Birds of Southern Africa (SA Birding, 2011). Approximately 87% of the total species in the QDGCs are associated with grassland habitats, farmlands, and inland water habitats, which is the character of the study area and surroundings. While most of the natural habitat on the site has been modified, this demonstrates that the available habitats within the surrounding areas can support most bird species within the QDGC.

The Majuba Nature Reserve is ~14.5 km southwest of the Qhakaza site, and the Afrikan Farms Protected Environment is ~13 km southeast. The site falls within the boundary of the Grasslands Important Bird Area (IBA) (IBA number ZA016), while the Amersfoort-Bethal-Carolina IBA (ZA014) is ~7.5 km to the northwest of the site. In addition, most of the remaining natural grassland on the site and surrounding areas is flagged as Protected Area Expansion Priority Areas.

The specialist confirmed that the Qhakaza site is largely transformed, with most areas modified by farming activities. The site is comprised mostly of cultivated fields (approximately 60.3%) with a patch of natural open grassland vegetation that appears quite heavily grazed in the site's western section. Natural grassland makes up ~28% of the

site. A patch of secondary grassland occurs in the southeastern corner, and a natural drainage line with a few small farm dams flows into the southeast corner of the site. The study area and surroundings comprise farmland with patches of natural open grassland habitat, interspersed with natural watercourses and wetlands with small farm dams, and support many avifaunal species typical of the grassland biome. Furthermore, the many rivers, farm dams, and wetlands provide important habitats for waterfowl and other wetland-associated species, while the wet areas provide surface water for drinking for all fauna.

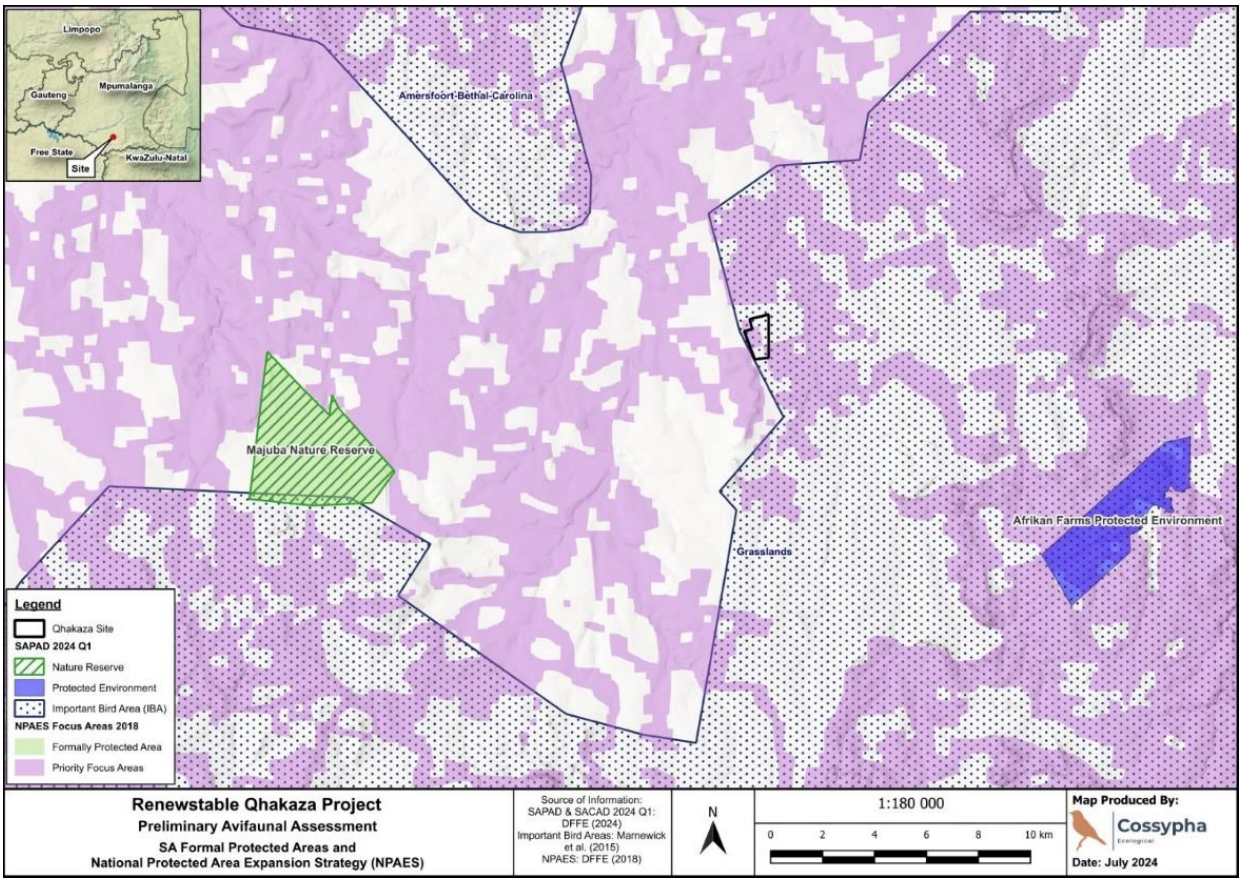


Figure 34: The Qhakaza study area in relation to national Protected Areas

The Qhakaza site is mainly transformed, with most areas modified by farming activities. The most important habitat for avifauna on the site is the patch of natural open grassland vegetation and the natural drainage line in the southeastern corner. However, the natural open grassland vegetation on the site is limited and relatively fragmented by the surrounding farming practices (mostly cultivated fields). It is, therefore, unlikely that this habitat supports any significant populations of grassland species. The study area is mainly comprised of cultivated fields with low **sensitivity**. The natural grassland on the site has a **medium sensitivity** rating, while the natural drainage line and wetlands are rated as **highly sensitive**.

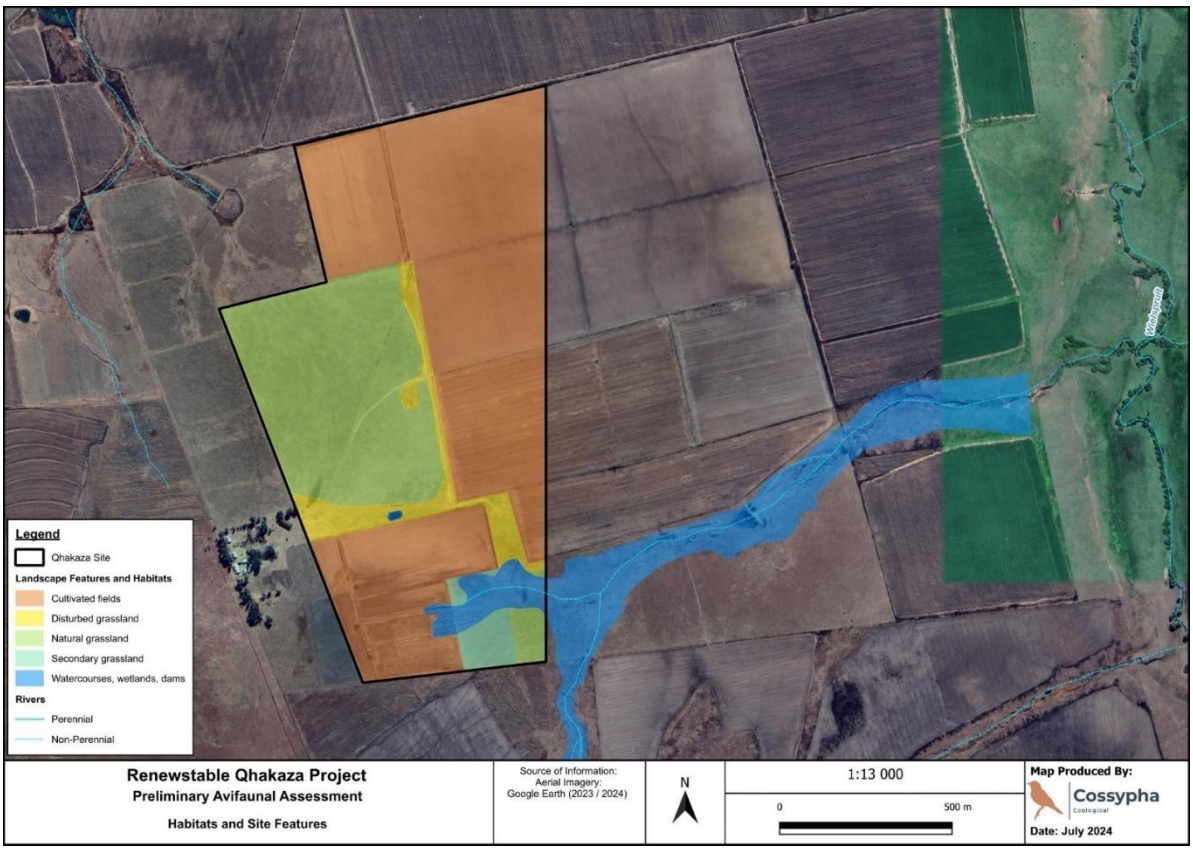


Figure 35: Habitat features of the Qhakaza study area

The specialist indicated that 36 species of birds were recorded in the study area and surroundings during the preliminary field survey. Birds were identified by direct observation (sighting and/or call) or field signs such as tracks or feathers. Bird species observed in the study area included mainly species typical of the grassland biome, such as cisticolas, larks, longclaws, swallows, chats, and pipits. The report confirmed that No SSC were recorded in the study area during the preliminary site survey; however, SCC such as Blue Crane *Grus paradisea* (NT / VU), Secretary bird Sagittarius serpentarius (VU / EN), Greater Flamingo Phoenicopterus roseus (NT / LC), and Southern Bald Ibis Geronticus calvus (VU / VU) are known to occur in the area. During the preliminary field survey, such species were recorded within a ~15 km radius of the Qhakaza site.

Preliminary assessments of species recorded in and around the study area show that some bird species may be susceptible to the impacts of solar PV development in the study area and surrounding areas. These include a few SCC as well as large-bodied, ground-welling gamebirds such as guineafowl and spurfowl; waterfowl such as ducks, geese, flamingos, and ibises; raptors such as kites, buzzards, and Secretary birds; and gregarious species such as quelea, swallows, bishops, and widowbirds.

According to the DFFE Screening tool, avian sensitivity is considered low. For the Animal Species theme, the sensitivity rating identified **by the Low for Aves screening tool aligns as it can be deemed low for most of the site and Medium for a patch in the western section**. Several priority species, including SSC, are known to occur in the region; therefore,

once the development footprint has been finalised, an assessment of potential impacts that the proposed development may impose on avifauna should be conducted following the Species Environmental Assessment Guidelines (SANBI, 2020) by the Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Animal Species (GN 1150 of 30 October 2020) as amended 28 July 2023.

Cossypha (2024) indicated that the Screening Tool Report identified a possible site environmental sensitivities of **Low** for Aves under the Avian Species theme.

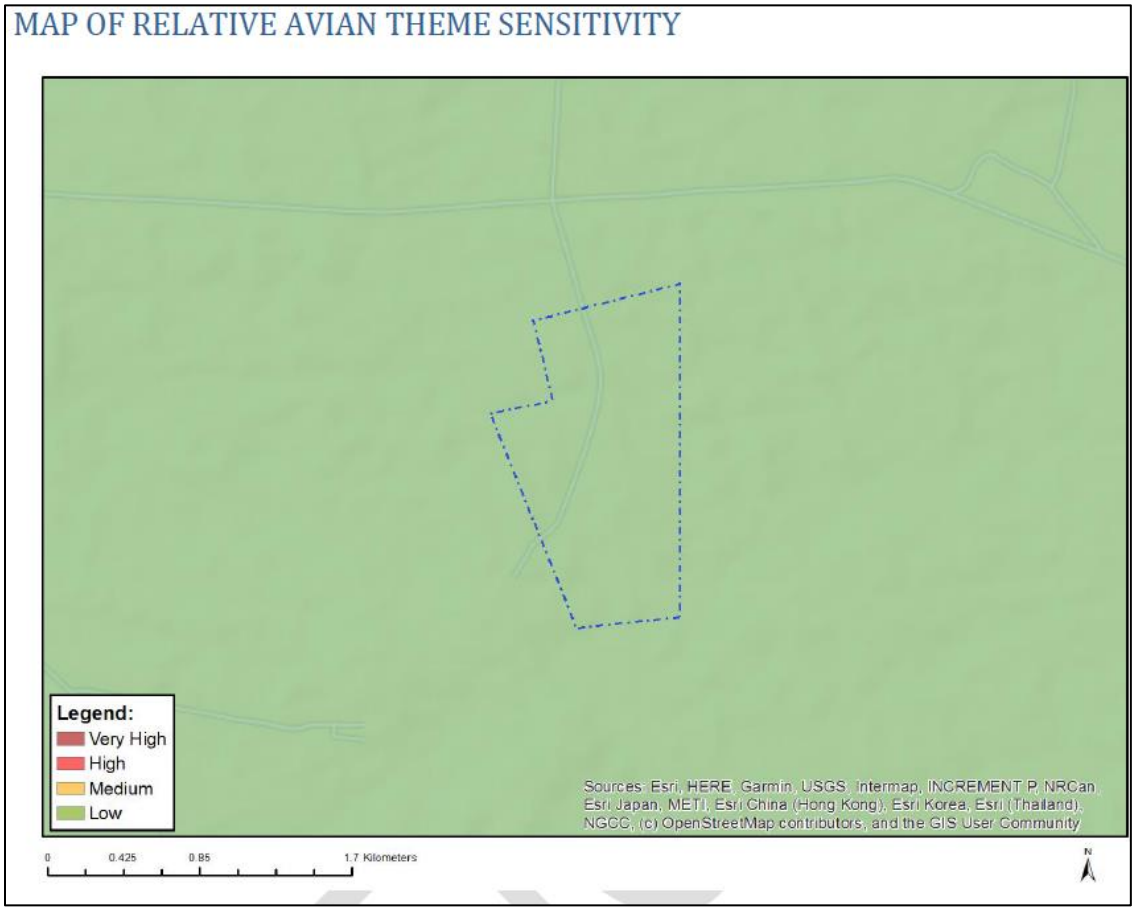


Figure 36: Relative avian sensitivity theme (DFFE Screening Tool Report, 2024)

The site is deemed medium due to the potential occurrence of the following bird Species of Conservation Concern (SCC) within the study area:

- High: *Balearica regulorum* Grey Crowned Crane (EN)
- High: *Geronticus calvus* Southern Bald Ibis (VU)
- Medium: *Eupodotis senegalensis* White-bellied Bustard (VU)
- Medium: *Tyto Capensis* African Grass Owl (VU)
- Medium: *Spizocorys fringillaris* Botha's Lark (EN)
- Medium: *Neotis denhami* Denham's Bustard (VU

Table 36: Relative Avian Sensitivity Screening Tool Vs Specialist SSV Outcomes

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Avian			SSV Outcomes	DFFE Screening Tool

10.1.15 ARCHAEOLOGICAL AND HERITAGE

The proposed Renewstable Qhakaza border Renewstable Ntokozo where several graves were recorded. Based on the current layout, the recorded sites are 600 m from the south-eastern border. Considering that graves are protected under Section 36 of the National Heritage Resources Act. Section 36 states that no person may, without a permit issued by SAHRA or a provincial heritage resources authority, destroy, damage, alter, exhume, remove from its original position, or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority.

Other than the identified graves nearby, no other sites of heritage significance were identified within the site, as depicted on the map below.

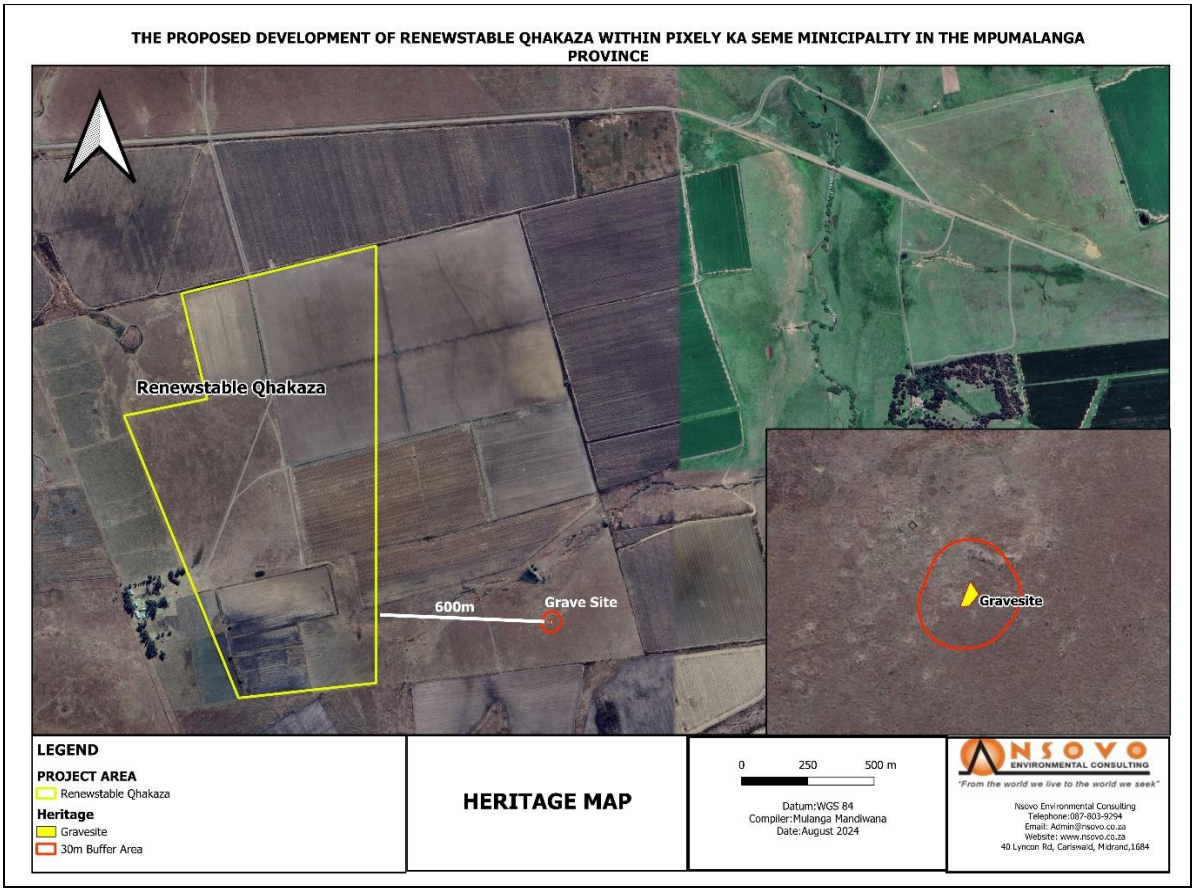


Figure 37: Heritage Map

According to the DFFE Screening Tool, the archaeology and cultural theme sensitivity is low; see Figure 38 below. The Site Sensitivity Verification confirmed the sensitivity to be Low.

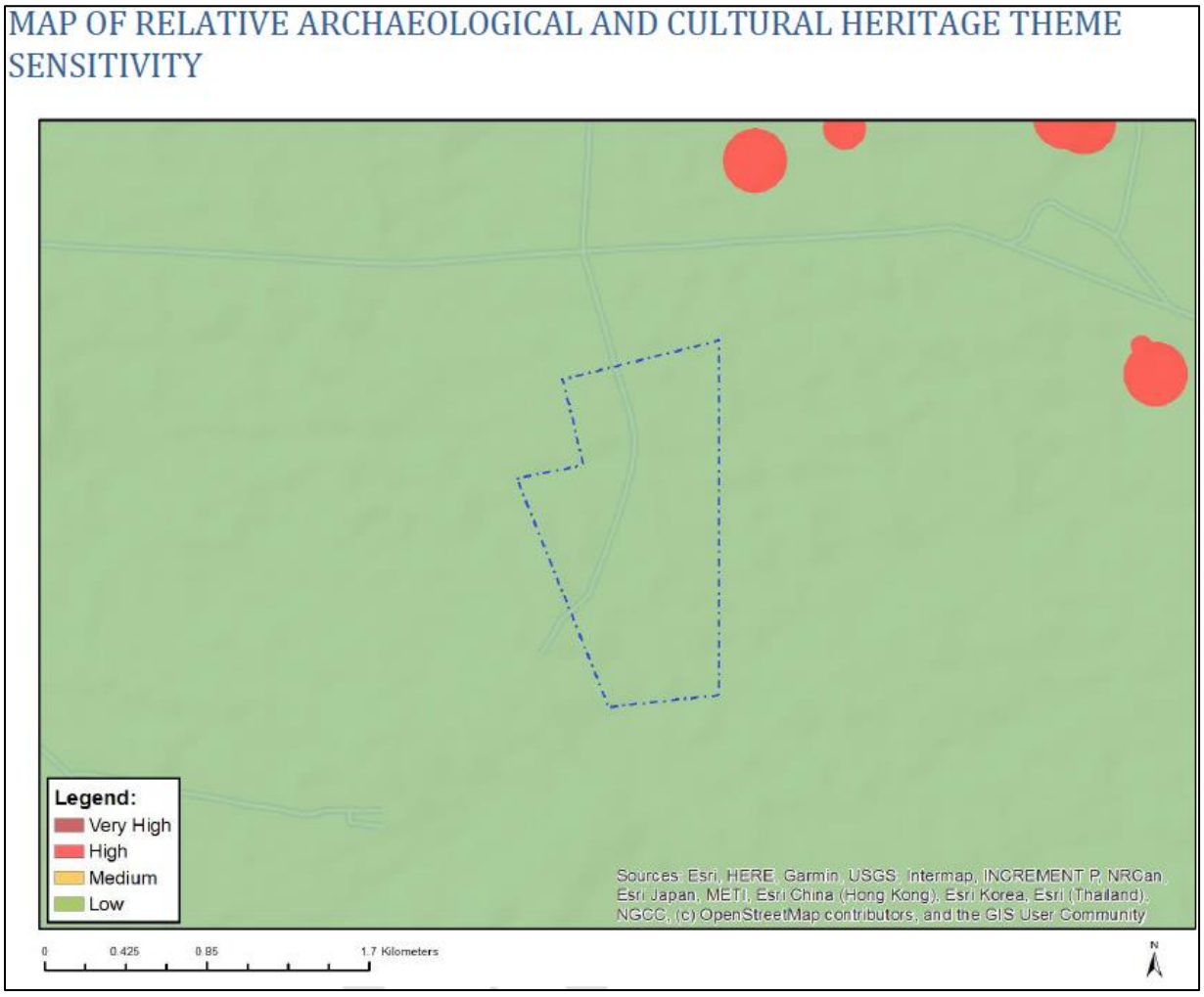


Figure 38: Map of relative archaeology and cultural theme (DFFE Screening Tool Report, 2024)

Table 37: Relative Heritage/archaeology Sensitivity Screening Tool Vs Specialist SSV Outcomes

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Archaeology and cultural				DFFE Screening Tool SSV Outcomes

10.1.16 DEFENCE

Defence is rated low in the Screening Tool (Refer to Figure 39 below) and this was verified to be low during a site visit and GIS mapping, which determined that there are no areas of defence sensitivity near the proposed development site, as indicated in Figure 39 .

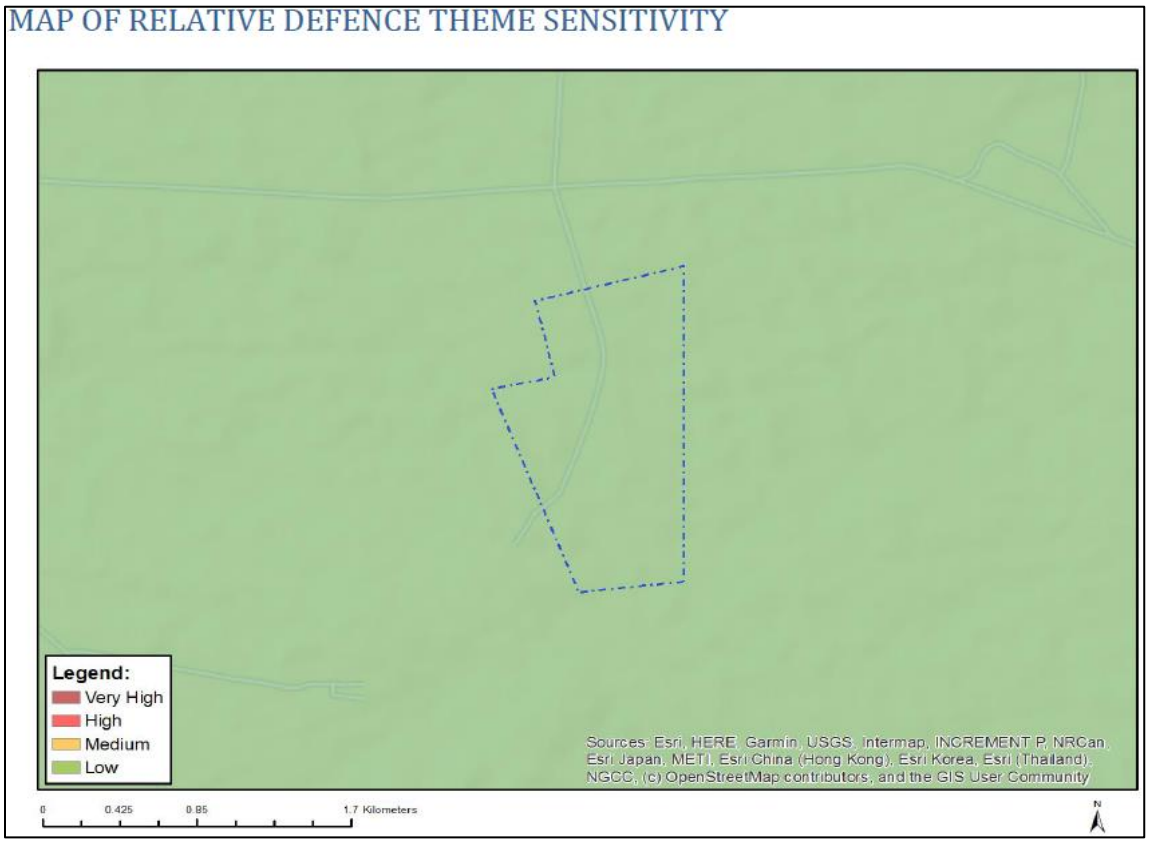


Figure 39: Relative Defence theme sensitivity (DFFE Screening Tool Report, 2024).

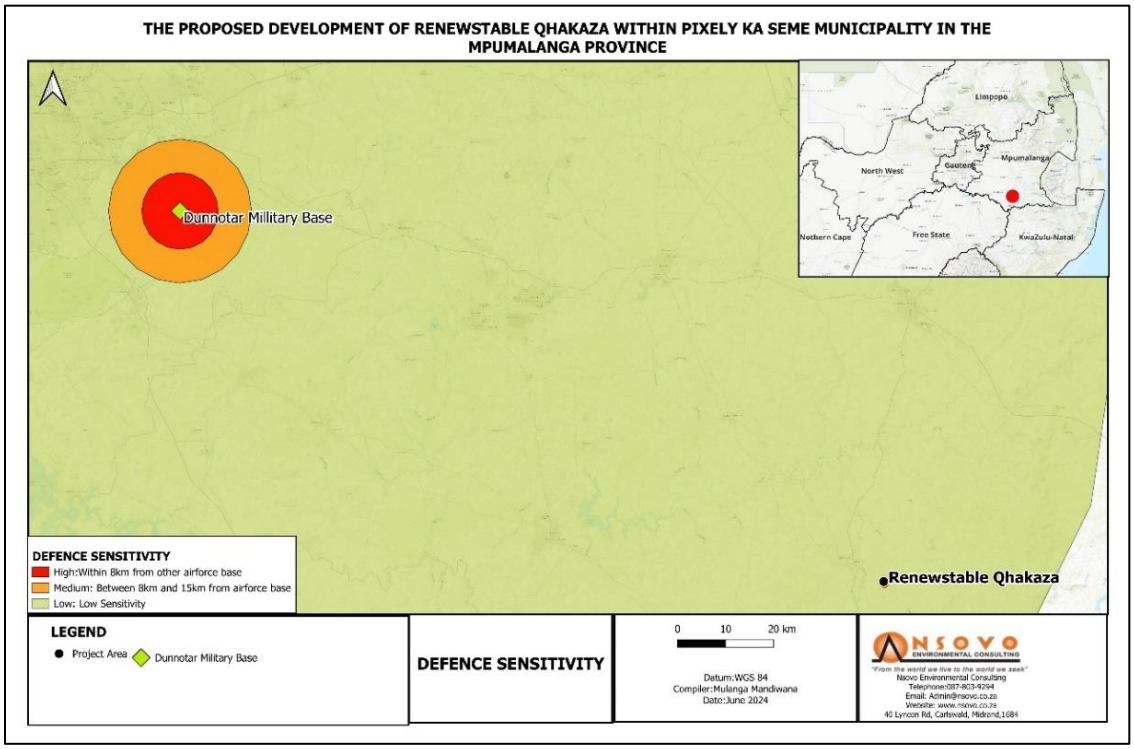


Figure 40: Defence Sensitivity within the development project area.

Table 38: Relative Defence Sensitivity Screening Tool Vs Specialist SSV Outcomes

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Defence				DFFE Screening Tool SSV Outcomes

10.1.17 CIVIL AVIATION

The Civil Aviation Assessment Report indicated no potential penetrations of any Obstacle Limitation Surfaces (OLS), and the overall aviation safety risk is low. The proposed sub-project will not materially impact civil aviation radar, navigational, or communications infrastructure in the environs nor present additional material risks to operations at the affected aerodrome or within adjacent airspace.

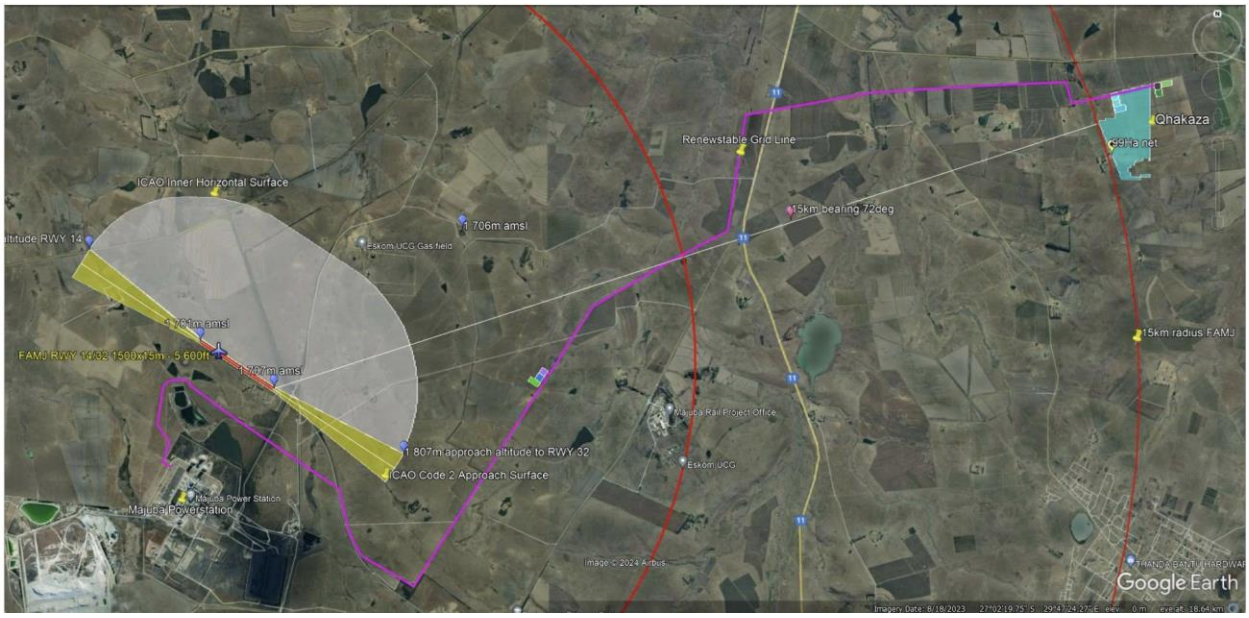


Figure 41: General Location of the Renewstable® Qhakaza Sites relative to Majuba Aerodrome FAMJ

The air space radar and communication assessment confirmed the following:

- There are no civilian radar facilities within 35km of the proposed prospecting site.
- The airspace around FAMJ is uncontrolled.
- The airspace classification of the environs around FAMJ.
- There are no civilian radar facilities at FAMJ.
- The closest ground-based navigational equipment is a VOR/DME array 'STV' near Standerton, some 100 km NW of the proposed facility.
- The closest commercial aerodrome is Newcastle (FANC), some 78km to the south.

The impact assessment of the CASSV by GWI (2024) are as follows:

- Obstacles The detailed analysis contained in 1 concluded that there are no potential penetrations of any Obstacle Limitation Surfaces (OLS's), and the overall aviation safety risk is therefore low.
- There are no significant obstacles between FAMJ and the proposed development (Figure 7), other than natural terrain at a maximum elevation of 1 737 mamsl, beyond the inner horizontal surface. The site itself lies below the aerodrome reference level, and there is no penetration of any OLS.

According to the Screening Tool, the site sensitivity is rated Medium, as indicated in Figure 42 below. The Site sensitivity verification confirmed the site to be of low sensitivity.

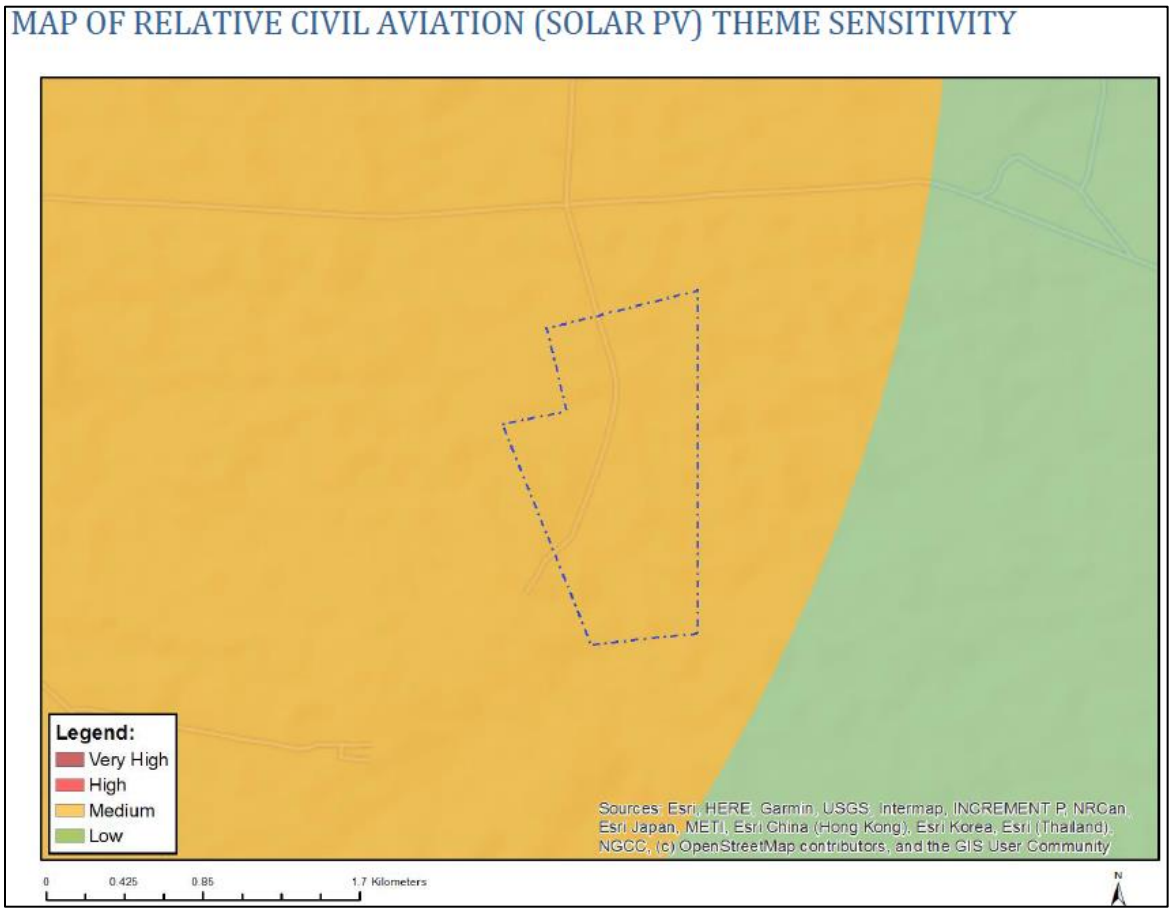


Figure 42: Map of relative Cicil Aviation sensitivity theme (DFFE Screening Tool Report, 2024).

Table 39: Relative Civil Aviation Sensitivity Screening Tool Vs Specialist SSV Outcomes

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
CAA				DFFE Screening Tool SSV Outcomes

10.1.18 PALEONTOLOGY

The proposed study area is within the potential fossiliferous Volksrust Formation (orange). Non-fossiliferous Jurassic dolerite (volcanic intrusive rock) is indicated as grey, and the very highly sensitive Vryheid Formation.

Based on experience and the lack of any previously recorded fossils from the area, it is extremely unlikely that any fossils would be preserved in the overlying soils of the Quaternary. There is a minimal chance that fossils may occur in the underlying shales or mudstones of the Volksrust Formation, so a Fossil Chance Find Protocol should be added to the EMPr. The impact on the palaeontological heritage would be low.

According to the DFFE Screening Tool, the Paleontology sensitivity is considered High, as shown in Figure 43 below, and the site sensitivity verification confirmed the sensitivity to be low.

Figure 43: Map of relative Paleontology sensitivity map (DFFE Screening Tool Report, 2024)

The specialist concluded that the proposed site lies close to the non-fossiliferous *Jurassic* and on the highly sensitive Volksrust Formation (Ecca Group, Karoo Supergroup) and that potentially could preserve fossil plants of the *Glossopteris* flora associated with the coal seams or bivalves. No fossils have been recorded from this site; nonetheless, a Fossil Chance Find Protocol should be added to the EMPr. Based on this information, it is recommended that no further palaeontological impact assessment is required unless fossils are found by the contractor, environmental officer, or other designated responsible person once excavations or drilling for foundations,

infrastructure, and amenities have commenced. Since the impact will be low, the project should be authorised as far as palaeontology is concerned.

Table 40: Relative Paleontology Sensitivity Screening Tool Vs Specialist SSV Outcomes

Theme	Screening tool sensitivity	Verified sensitivity	Outcome statement/ plan of study	Relevant section motivating verification
Paleontology	High	Low	No further palaeontological impact assessment	Section 7.2. SAHRA Requirements

10.1.19 RFI THEME

The specialist assessment by GWI (2024) confirmed that the proposed sub-project would not materially impact civil aviation radar, navigational, or communications infrastructure in the environs, nor present any material additional risks to operations at the affected aerodrome or within adjacent airspace. Furthermore, the proposed sub-project does not affect any conventional or satellite-based route under air traffic control (ATC) of ATNS centres at OR Tambo International Airport (FAOR).

The assessment summed up the key findings as follows:

- Radar and Navigational Infrastructure The proposed sub-project will not materially impact civil aviation radar, navigational, or communications infrastructure in the environs nor present additional material risks to operations at the affected aerodrome or within adjacent airspace. There is no evidence of ground-based civil radar installations closer than 35km from the site. This is well outside the 500 ft guideline recommended by the US FAA, within which potential RF interference could occur. The risk of interference has been assessed as low. There are no ground-based DVOR/DME (see Appendix 9: Glossary of Terms) installations within 8-15km of the sub-project site, and risk is assessed as low. No ground-based NDB installations are within 8-15km of the sub-project site, and risk is assessed as low.
- There is no evidence of ground-based civil radar installations closer than 35km from the site. This is well outside the 500 ft guideline recommended by the US FAA (per Appendix 9), within which potential RF interference could occur. The risk of interference has been assessed as low.

According to the DFFE Screening Tool, the RFI theme sensitivity is considered Medium, as shown in Figure 44 below, and the site sensitivity verification confirmed the sensitivity to be low.

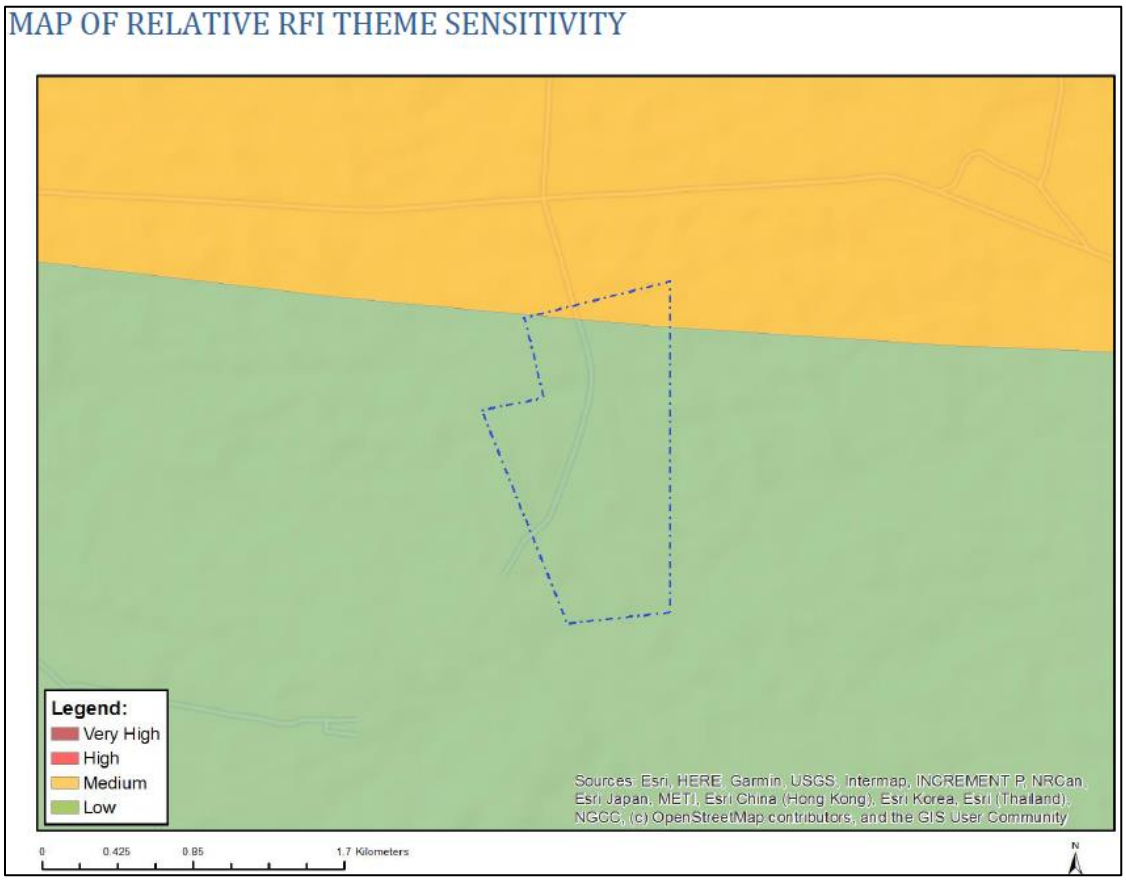


Figure 44: Map of relative RFI Theme sensitivity map (DFFE Screening Tool Report, 2024)

Table 41: Relative RFI Sensitivity Screening Tool Vs Specialist SSV Outcomes

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
RFI			DFFE Screening Tool	SSV Outcomes

10.1.20 GLINT AND GLARE

Receptors are sensitive elements that absorb light and transmit visual signals to the brain. The three (3) different receptors are as follows:

- Buildings and Roads: Buildings and roads are known as ground-based receptors as they are fixed onto the ground.
- Ground-based receptors identified for this project include:
    - Residential and commercial buildings adjacent to the proposed site;
    - Access Roads adjacent to the development;
    - Industrial facilities close to the site;
- Aviation: Aviation receptors are those specific towards the aviation industry and associated infrastructure.

The array will comprise 134,000 modules of 2,68m^2 each, with several solar PV modules installed in each frame. The frames will be linked and operated by an electro-mechanical tracking mechanism that will allow the interlinked frames to be rotated about the E-W axis to a maximum angle of 60^o (above the horizontal). Geometrically, at solar elevations higher than 30^o (i.e. throughout the year, at this location), the tracking mechanism will allow the PV modules to face the sun directly at midday, i.e. the reflected image of the sun will be directed back towards the sun itself.

The Glint and Glare (G&G) assessment arises because of potential risks to aviation operations at FAMJ posed by sunlight reflections from the solar PV arrays on the Renewstable® Qhakaza site. The types of reflections considered are specular reflections (as opposed to diffuse reflections), where the surface uniformity of the solar PV modules will result in the reflected light beams remaining relatively concentrated.

The preceding analysis has demonstrated that the relative position of the proposed solar PV array relative to the FAMJ runway, the sun position at various times of the year, and the potential of the proposed tracking mechanism to decrease the angles of incidence significantly all contribute to a lower risk of glint off the array than the pre-existing glare risk of low angle sun itself, itself already low. The marginal risk and its impact under all scenarios analysed is thus considered insignificant, and no mitigation will be required.

10.1.21 Air Quality and Pollution

Air quality is an issue of concern in Mpumalanga, as it is in many other parts of South Africa. Poor air quality's driving forces include human activities and natural processes. Driving forces associated with human activities include economic activity, urbanisation, industrial development, and population growth. Forces from natural processes can consist of climate change, natural disasters, and many others. These driving forces lead to pressures on the natural environment, such as increased resource demand, habitat change, and increased development. The pressures, in turn, impact the natural, social, political, and economic environments (Mpumalanga DACE, 2003).

Various natural and anthropogenic sources of air pollution exist in Mpumalanga, ranging from wildfires to industrial processes, agriculture, mining activities, power generation, paper and pulp processing, vehicle use, and domestic use of fossil fuels. Different pollutants are associated with each activity, ranging from volatile organic compounds and heavy metals to dust and odours (Mpumalanga DACE, 2003).

Air quality is defined as noise and odour, and all sources of air pollution (i.e., point, area, and mobile sources) are addressed. The Mpumalanga Air Quality Management Plan has been developed to comply with the National Environmental Management: Air Quality Act, 39 of 2004, and, more specifically, to guide Air Quality Management in the Gert Sibande District Municipality. The Plan identifies air pollution sources in the proposed locations as follows:

- The outdoor sources of air pollution resulting from human activities comprise three broad categories.

- Stationary sources can be subdivided into rural areas, such as agriculture, mining, and quarrying, and industrial point and area sources, such as chemical manufacturing, non-metallic mineral products, basic metal industries, and power generation.
- Community sources include heating homes and buildings, municipal waste and sewage sludge incinerators, fireplaces, cooking facilities, laundry services, and cleaning plants.
- Mobile sources include combustion-engine vehicles, such as light-duty petrol-powered cars, light and heavy-duty diesel-powered vehicles, motorcycles, and aircraft, and line sources, such as fugitive emissions from vehicle traffic.
- Air pollutants are traditionally classified into suspended particulate matter (dust, fumes, mists, and smoke), gaseous pollutants (gases and vapours), and odours. Few sources of air pollutants exist within and around the proposed area. Motor vehicles along the N11 may sometimes have elevated particulates and Nitrogen oxide (NO2) concentrations. Dust generation is expected from the agricultural areas around the study area.

The technical guidelines exhaust gas emissions can be expected. Due to the low peak combustion temperature in the engines, the emission of nitrogen oxides (NOx) is relatively low. Running on clean natural gas, the engines have inherently low particulate matter (PM) and sulfur dioxide (SO2) emissions. Emission levels at steady 100% load, constant speed 500RPM or 514RPM, CR = 11; However, during start, stop, and transient load variations, the exhaust gas emissions may temporarily deviate from the steady state conditions.

EHRCON (2024) defines receptors as sites (or areas) that the process or activity may potentially impact. In their study, sensitive receptors were selected based on proximity to the project and comprise farmsteads, small holdings, residences, wildlife conservancies, recreation, commerce, utilities, and light/heavy industrial and mining processes up to 5 kilometers from the proposed power plant.

The DFFE Screen Tool Map confirms that the proposed site is within the Mpumalanga Air Quality Priority area.

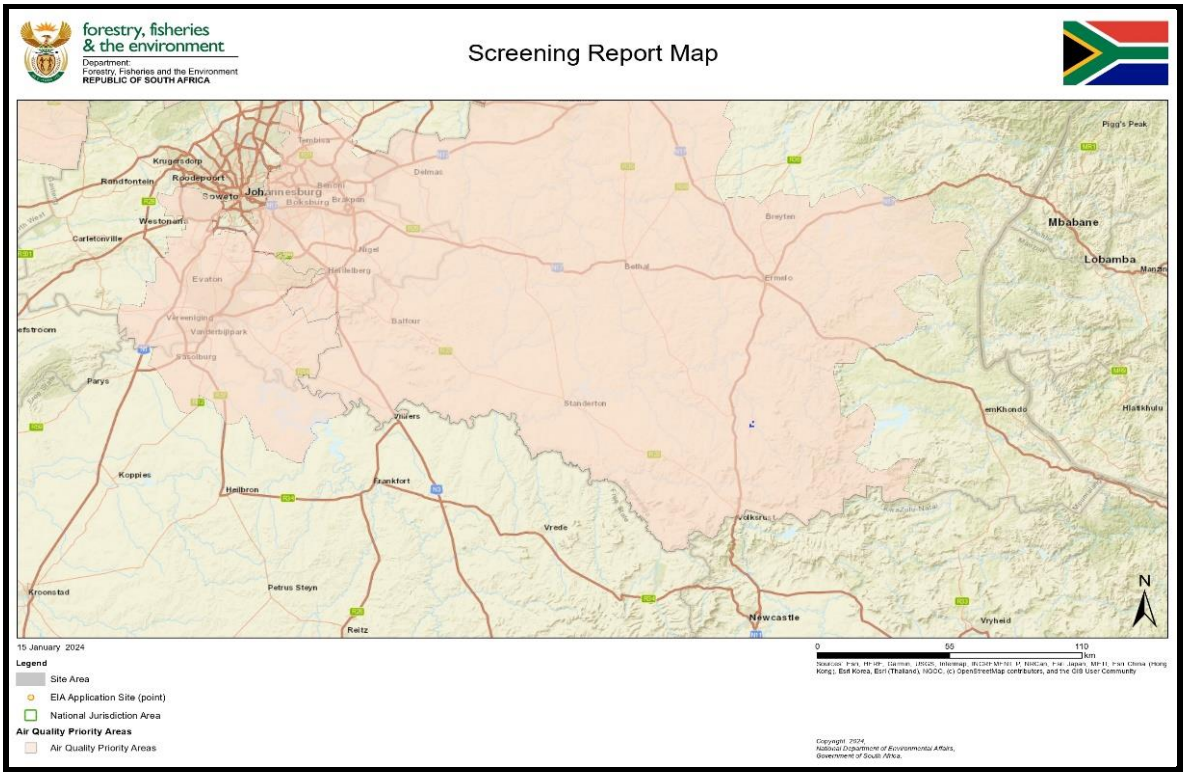


Figure 45: Confirmation of Air Quality Priority Areas Within the Study Area

10.2 SENSORY ASPECTS

10.2.1 NOISE

In terms of the Noise Regulations, a noise disturbance is created when the prevailing ambient noise level is exceeded by 7.0 dBA or more. Noise is part of our daily exposure to different sources, which is part of daily living, and some of these physical attributes may sometimes be part of the ambient levels that people get used to without noticing the higher levels. Two aspects are important when considering the potential impacts of a project:

- The increase in the noise levels; and
- The overall noise levels that the proposed activities will create.

During construction, the immediate environmental noise levels will temporarily shift upward. However, the noise increase at the abutting residential properties will not exceed the prevailing ambient noise levels during the construction, operational, and decommissioning phases, as it may be below the threshold value of 7.0 dBA.

10.2.2 VISUAL ASPECTS

Visual appreciation or dislike is subjective, and thus, what is aesthetically pleasing to some can be displeasing to others. The visual analysis of a landscape and the impact of new developments and structures tend to be complicated,

and it is evident from previous experience that when dealing with the reaction to landscape changes, a large diversity of opinion exists. In this regard, the applicant must be sensitive from a visual impact perspective to the requirements of the local people and farmers. Many topographical features influence this environment and must be utilised to minimise visual impacts and intrusions when selecting an alignment.

The study area consists primarily of human settlements and agricultural land. The natural landscape is generally degraded, with some pristine grassland landscape remaining. Some vacant undeveloped land was previously cultivated, as well as land used for subsistence farming. The landscape character changes throughout the study area, and there is a change in elevation and topographical features. Landscape types are distinguished by differences in topographical features, vegetation communities and patterns, land use and human settlement patterns (Swanwick; 2002).

The entire study area is considered to have low tourism potential, primarily because of the environmental degradation caused by mining developments and human settlements. There is also no major thoroughfare to prominent tourist destinations.

10.2.3 CLIMATE CHANGE IMPACT

Scientific opinion suggests that the continued emission due to human activities of greenhouse gases, principally carbon dioxide and methane, may bring about significant and long-term changes to the functioning of the earth's atmosphere. Of great uncertainty still are the possible impacts and damage attributable to such climate change, although indications are that their scale could be significant. According to the White Paper on Energy, South Africa is responsible for 1,6% of global greenhouse gas emissions, and the country's energy sector is the single largest source of greenhouse gas emissions in Africa, being dependent on coal for more than 75% of the country's primary energy needs during 1997. This level of emissions is also mainly because of the high level of coal used by the electricity generation and synthetic fuels industries and the high level of industrialisation that produces high energy content products. A balanced, least-cost energy supply mix is promoted to fulfil the national energy policy of making clean, affordable and appropriate energy available to all population sectors. Although the country faces obligations to reduce its greenhouse gas emissions soon, international governance of this problem is evolving.

When considering climate change, two aspects are relevant:

- Reducing greenhouse gas emissions (climate protection relevance); and
- Adapting to climate change (climate change adaptation relevance).

10.2.3.1 Key issue: Greenhouse gas emissions

Regarding greenhouse gas emissions, the emissions during the project's construction and operational phases are unlikely to have a major negative impact on the country's per capita GHG emissions. The construction phase is relatively short compared to the project's design life, and emissions during this time will primarily result in tailpipe emissions of construction vehicles and equipment. Power generation is limited to renewable sources (Solar and hydrogen) for the operational phase, so no GHG is emitted.

10.2.3.2 Key issue: Climate change adaptation

Adapting to climate change has been identified as a critical threat to sustainable development and the general welfare of society. The proposed project may be vulnerable to environmental changes due to climate change.

A Climate Change Study will be undertaken to consider both greenhouse gas emissions (climate protection relevance) and climate change adaptation measures that must be considered part of the project's design.

10.3 Social Baseline

The proposed project can have positive and negative socio-economic consequences; therefore, the socio-economic baseline conditions must be understood to ensure accurate identification and assessment of the proposed Project's potential impacts. This section provides an overview of the socioeconomic baseline of the proposed project area from the district and local municipality levels.

10.3.1 Socio-Economic Sensitive Areas in proximity to the site

Figure 46 indicates the socio-economically sensitive areas in proximity to the proposed development. Neighbouring farms are large, and local communities within a 5 km radius may experience a range of impacts related to the proposed Project; as such, these farms and local communities represent the direct influence. No dwellings are located within the project site; however, numerous farmhouses/homesteads are sparsely populated within a 10km radius.

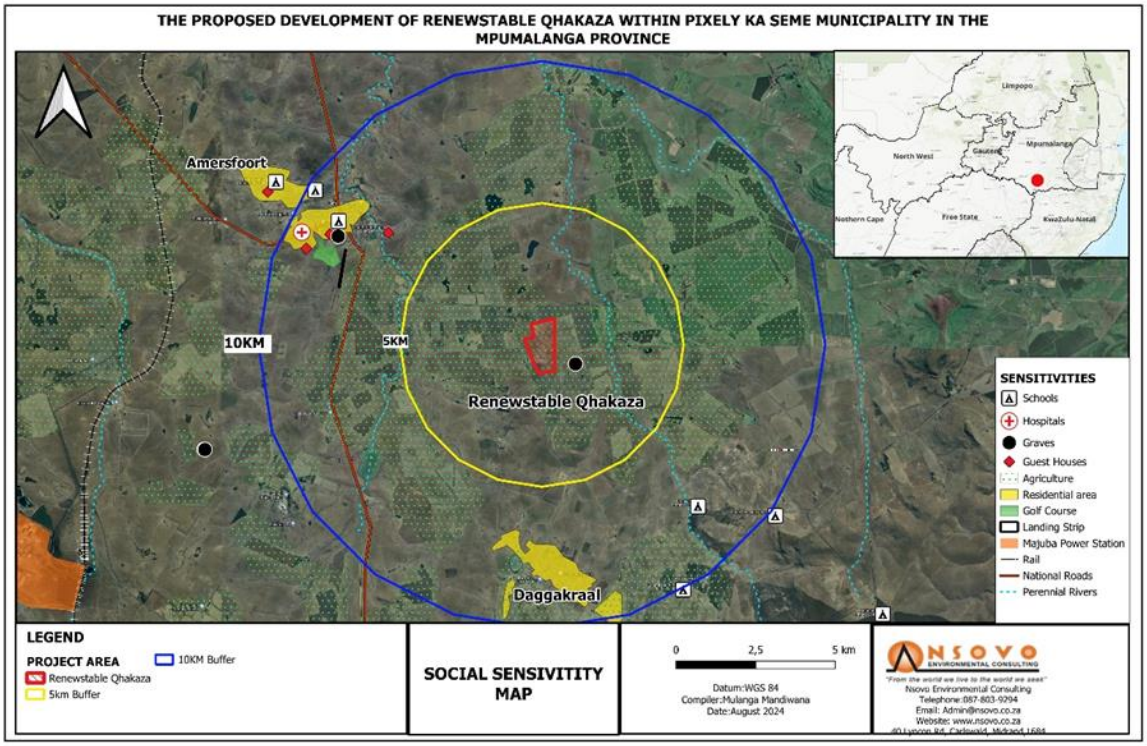


Figure 46: Socio-Economic Sensitive Areas Close to the Project

The risk rating used for social is presented below:

Table 42: SIA Risk Rating Matrix

LEGEND		Definition
Very High Sensitivity		The identified issue is extremely sensitive to the negative impact on project development. As a result, the area will either have very high conservation value, very high existing/ potential socio-economic value, or hold legal protection status.
High Sensitivity		The area is rated highly sensitive to the negative impact on project development. As a result, the area will either have high conservation value or existing/potential socio-economic value.
Medium Sensitivity		The area is rated as being of medium sensitivity to the negative impact on project development. As a result, the area will either have medium levels of conservation value and/or medium levels of existing/potential socio-economic value.
Low Sensitivity		The area is considered to have low sensitivity levels in the context of project Development.

Table 43: SIA Risk Assessment

Constraints	5km	10km
Residential /hospitality		
Social Services – Schools and health care facility		
Agricultural Land		
Road		

Constraints	5km	10km
Rail		
Graves		
Social Facility -Golf Course		

10.3.2 LAND USE

Land use within the Municipality accommodates diverse activities, including agriculture, mining, residential development, and conservation. In this context, careful planning is essential to ensure land is utilised efficiently, benefiting the community and the environment. This approach supports economic growth and encourages social integration, balancing the needs of various sectors to create a cohesive and sustainable community.

- Agriculture dominates land use in rural areas, particularly crop production and livestock farming. These activities are vital for local food security and economic stability, and much of the rural land is dedicated to agriculture and grazing.
- Mining activities, especially in areas rich in coal deposits, contribute significantly to land use and the district's economic activity. Mining operations affect land allocation, requiring dedicated extraction, processing, and associated infrastructure zones.
- Residential Areas: Land use for residential purposes varies from formal housing developments in urban towns to informal settlements in rural peripheries. These residential areas require careful planning to ensure access to essential water, electricity, and transportation services.
- Conservation: Some portions of land may be allocated to conservation efforts, especially in areas with significant biodiversity or near critical water resources. Conservation areas are essential for protecting the environment and maintaining the ecological balance in the region.
- Urban Development: Urban development is concentrated in towns and urban centres within the municipality. The land is allocated for commercial, residential, and industrial use, supporting economic activities while providing housing and services for the local population.

The study area occurs on the land that ranges in elevation from approximately 1667m above sea level on the banks of the non-perennial rivers and dams to 1700m above sea level on the hills located to the southeast and southwest of the proposed study area. The study area is within the Amersfoort Highveld clay grassland, which comprises undulating grassland plans. The land cover is predominantly grassland and cultivated crops. Land use throughout the project proximity is entirely agricultural, which includes intensive livestock (cattle, goat, piggery, and sheep) and substantial crop farming (Maize and soybean), and the vegetation is short and often grazed to form short lawns (refer to **Figure 47**).

Figure 47: General topography and vegetation in the study area (Mdumeya Group, 2024)

The project site is accessible from N11 via a secondary road. The study area's greater environment is characterized by wide-open spaces, extremely low development, and sparse homesteads. However, a few authorised (and current) proposed renewable energy projects within the study area and neighbouring regions could change the landscape. There are no protected or conservation areas, protected sites, or tourist routes in the study area.

Figure 48: Access the secondary road to the site from N11 via Amersfoort (Mdumeya Group, 2024)

10.3.3 Political and Administrative Structure

The province has a dual system of governance, with political institutions of governance and traditional authority, each of which is briefly detailed below:

10.3.3.1 Political Structure of Government

South Africa is a constitutional democracy with a three-tiered government and a separate judiciary. National, provincial, and local governments have legislative and executive authority in their respective sectors. The provincial government is responsible for developing the province's strategic vision and framework. They guarantee inter-municipal cooperation and coordination and ensure that each municipality accomplishes their particular tasks. District

municipalities, comprising local municipalities, are responsible for developing IDP and the overall supply of services and infrastructure within the districts. The goal of district and local governments sharing responsibilities for local government is to provide equal access to resources and services to all communities, particularly disadvantaged ones.

10.3.3.2 Traditional Authorities

According to GSDM IDP 2019-2020, traditional authorities are primarily found in rural areas, where chiefs and their councils oversee organising local communities if any investment projects fall under their area of Jurisdiction and handling community administrative duties. The project itself is not situated in the traditional area. However, the House of Traditional Leaders for the district has been established.

10.3.4 Economic Landscape

The municipality's economic landscape is shaped by a mix of key sectors, including agriculture, mining, manufacturing, and services, which collectively drive local economic activity. These sectors are vital for employment, income generation, and overall economic growth, but they also present challenges that must be addressed for sustainable development.

- Agriculture remains a dominant sector, particularly in rural areas. The municipality produces maise, soybeans, vegetables, and livestock farming. Agriculture provides food security, creates employment opportunities, and supports local agribusiness. However, the sector faces challenges such as fluctuating climate conditions, water scarcity, and the need for modern farming techniques. Agriculture contributes approximately 15% to the municipality’s GDP, accounting for around 30-35% of total employment.
- Mining: The municipality is in a region rich in mineral deposits, especially coal, which plays a significant role in local and national economic activity. Mining provides substantial employment and generates considerable revenue. However, it also poses environmental challenges, particularly regarding land degradation and water pollution, which require careful management through sustainable practices. Mining contributes roughly 30% to the municipality’s GDP and accounts for around 20-25% of employment, with many jobs concentrated in coal-rich areas.
- Manufacturing and Industry: Manufacturing supports economic diversification in the municipality, mainly through processing agricultural and mineral products. The development of light industry and small manufacturing enterprises provides additional employment opportunities. Manufacturing contributes about 10% to the municipality’s GDP and employs approximately 10-15%.
- Public Services and Retail: The services sector, which includes retail, education, healthcare, and public administration, significantly contributes to the municipality’s economy. Urban centres serve as hubs for commercial activity, providing essential goods and services to urban and rural populations. Retail is mainly growing in larger towns, driven by increased consumer demand and urbanisation. The services sector

contributes approximately 25% to the municipality's GDP and accounts for around 25-30% of employment, with most jobs located in urban and peri-urban areas.

- Tourism and Conservation: In areas where conservation efforts are prioritised, tourism plays a role in the local economy. Natural reserves and biodiversity hotspots attract visitors, supporting eco-tourism and job creation in the hospitality and services sectors. Tourism contributes around 5% to the municipality's GDP and is responsible for 5-10% of total employment, with significant potential for growth through investment in infrastructure and marketing.

Despite these sectors' contributions, the municipality faces ongoing challenges such as high unemployment, income inequality, and infrastructure deficits. The overall unemployment rate is estimated at 30-35%, with youth unemployment often exceeding 50%. Addressing these issues requires economic diversification, skills development, and infrastructure investment. The municipality's economic strategy must also balance resource extraction with sustainable practices while enhancing sectors like tourism and services to create a more resilient economy.

10.3.5 Road Networks

The total road network of Dr Pixley Isaka Ka Seme is 278km, of which 85km is surfaced and 193km is gravel road. The Municipal roads are in poor condition due to high volumes of coal haulage trucks transporting coal to the Majuba Power Stations and other areas within and beyond its jurisdictional area, inflating the maintenance expenditures of all three spheres of government on roads across municipal boundaries. The N11, which runs through the area between Ermelo, Amersfoort, and Volksrust, is an important north-south traffic route that connects the Limpopo Province and Northern KZN. The N11 is a freight transportation route that can also be seen as a potential tourism corridor. Because it is in good shape, this route can be used to tap into the municipal jurisdiction's economic development.

Other provincial highways within the municipal boundaries include the R23 (which connects Volksrust to Standerton), R35 (which connects Amersfoort to Bethal), and the R543 (which connects Volksrust to Piet Retief). Some roads, primarily those maintained by local and provincial governments, must be adequately gravelled or tarred. Footbridges over streams and rivers are also in high demand in rural areas, where most roads are gravel and inaccessible during rainy seasons.

The proposed site is near the intersection of the regional road R35 and N11, and several access roads leading from either R35 or N11 provide access to the project site. Most of these roads require maintenance and upgrading. According to Pieter Jooste (2023), the traffic volumes on the surrounding road network were determined in November 2023, with the common peak traffic hours occurring between 06h45-07h45 for the AM peak hour and 14h15-15h15 for the PM peak hour.

11 METHODOLOGY FOR ASSESSING THE SIGNIFICANCE OF POTENTIAL IMPACTS

The assessment of impacts is primarily based on the Department of Environmental Affairs and Tourism's (1998) Guideline Document: Environmental Impact Assessment Regulations. The evaluation will consider implications arising from the project's proposed activities before and after implementing appropriate mitigation measures.

The impacts are assessed according to the criteria outlined in this section. Each issue is ranked according to extent, duration, magnitude (intensity), and probability. A significance rating is obtained from these criteria, and the method and formula are described below. Where possible, mitigation recommendations have been made and are presented in tabular form.

The criteria in Table 44 below will be used to evaluate. The nature of each impact will be assessed and described in relation to the extent, duration, intensity, significance, and probability of occurrence attached to it. This will be evaluated in detail for pre- and post-mitigation during the EIA phase.

Table 44: Methodology used in determining the significance of potential environmental impacts

Status of Impact

The impacts are assessed as either having a:

the negative effect (i.e., at a `cost' to the environment),

positive effect (i.e., a `benefit' to the environment) or

Neutral effect on the environment.

Extent of the Impact

(**1**) Site (site only),

(**2**) Local (site boundary and immediate surrounds),

(**3**) Regional

(**4**) National, or

(**5**) International.

Duration of the Impact

The length that the impact will last is described as either:

(**1**) immediate (<1 year)

(**2**) short term (1-5 years),

(**3**) medium-term (5-15 years),

(**4**) long-term (ceases after the operational life span of the project),

(**5**) Permanent.

Magnitude of the Impact

The intensity or severity of the impacts is indicated as either:

(**0**) none,

(**2**) Minor,

(**4**) Low,

(**6**) Moderate (environmental functions altered but continue),

(**8**) High (environmental functions temporarily cease), or

(**10**) Very high / Unsure (environmental functions permanently cease).

Probability of Occurrence

The likelihood of the impact occurring is indicated as either:

(**0**) None (the impact will not occur),

(**1**) improbable (probability very low due to design or experience)

(**2**) low probability (unlikely to occur),

(**3**) medium probability (distinct probability that the impact will occur),

(**4**) high probability (most likely to occur), or

(5) Definite.

Significance of the Impact

Based on the information above, the potential impacts are assigned a significance rating (**S**). This rating is formulated by adding the sum of the numbers assigned to extent (**E**), duration (**D**), and magnitude (**M**) and multiplying this sum by the probability (**P**) of the impact.

S=(E+D+M) P

The significance ratings are given below.

(**<30**) low (i.e., where this impact would not have a direct influence on the decision to develop in the area),

(**30-60**) medium (i.e., where the impact could influence the decision to develop in the area unless it is effectively mitigated),

(**>60**) high (i.e., where the impact must influence the decision process to develop in the area).

12 DESCRIPTION OF THE ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS, INCLUDING CUMULATIVE IMPACTS IDENTIFIED

This section describes the proposed project's potential impacts on the receiving environment. Impacts associated with the relevant environmental components within the study area have been assessed based on the EAP's opinion and consultation with specialist studies. Refer to Table 45 for the potential impacts identified.

12.1 PRELIMINARY IMPACT ASSESSMENT

The Scoping phase of the ESIA Process identified the potential positive and negative environmental (biophysical and social) impacts of the proposed project. Site-specific evaluations were undertaken for the proposed project options to establish the best environmentally and technically practicable site/location to evaluate in the EIA phase. The process involved a range of physical, biological, social, and technical criteria.

12.2 SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS IDENTIFIED

Potential environmental impacts identified during the Scoping phase are described in Table 45 below. This is not an exhaustive list but insight into the potential impacts associated with the proposed project. It must be borne in mind that the EIA phase may identify more potential impacts and will assess them in more detail.

Table 45: Potential Environmental Impacts Identified

Aspect	Impact	Impact Description	Mitigation Measures
Biodiversity	Negative	The current project area falls within sensitive habitats and other areas of high biodiversity potential; infrastructure placement must be cognisant of the sensitivity rating assigned to each. The current project area would be considered to have a significant and high negative impact as it would directly affect sensitive landscapes and the habitat of threatened plant species and expected SCC that depend on these ecosystems. Anthropogenic activities drive habitat destruction, causing displacement of fauna and flora and possibly direct mortality. Land clearing destroys local wildlife habitat and can lead to the loss of local breeding grounds, nesting sites and wildlife movement corridors such as rivers, streams, drainage lines, or other locally important features. Removing natural vegetation may reduce the habitat available for fauna species and reduce animal populations and species compositions within the area. The Project Area was categorised as possessing a single habitat 'High SEI. This is owing to the disturbed nature of the immediate footprint.	• Compilation of and implementation of an alien vegetation management plan for the project area • The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Footprint of the roads must be kept to prescribed widths. • Waste management must be a priority, and all waste must be collected and stored adequately. It is recommended that all waste be removed from the site weekly to prevent rodents and pests from entering. • All personnel and contractors are to undergo Environmental Awareness Training. A site induction must include the avoidance and protection of the wetland areas. Contractors and employees must all undergo the induction and be made aware of the "no-go" to be avoided.

Aspect	Impact	Impact Description	Mitigation Measures
		Impacts include: • Modified areas and CBA Areas will be lost, High SEI habitat will be lost, • The likelihood of losing SCC and Protected species that exists • Loss of vegetation within the development footprint • Degradation of surrounding habitats • Direct mortality of avifauna • Spread and/or establishment of invasive alien species • Displacement or Direct mortality of fauna • Disruption/alteration of species activities (breeding, migration, feeding) due to noise and vibration • Disruption/alteration of species activities (breeding, migration, feeding) due to dust Unplanned events that could impact on fauna include: • Spills into the surrounding environment • Fire • Erosion caused by water runoff from the surface	• A stormwater management plan must be compiled and implemented. • A pest control plan must be implemented; poisons must not be used due to the likely presence of SCCs. • Areas of Indigenous vegetation outside the direct project footprint should not be fragmented or disturbed further. • The construction area must be fenced off, and no ingress into other areas is allowed. • Watercourses, drainage lines, streams and wetlands must be avoided, and a no-go buffer of 20m must be applied around them. Refer to the aquatic report. • Areas of Indigenous vegetation, even secondary communities outside of the direct project footprint, should not be fragmented or disturbed further. No further loss of high-sensitivity areas should be permitted. It is recommended that areas to be developed be precisely demarcated so that only the demarcated areas will be impacted during the construction phase. • Existing access routes, especially roads, must be made use of.

Aspect	Impact	Impact Description	Mitigation Measures
			• All livestock must always be kept out of the project area, especially areas that have been recently re-planted. • A hydrocarbon spill management plan must be put in place. • A fire management plan needs to be complied with and implemented to restrict fire's impact on the surrounding areas. • . All protected and red-data plants should be relocated, and as many other species as possible. • For the threatened species that may not be destroyed, it is recommended that professional service providers that deal with plant search and rescue be used to remove such plants and use them for later rehabilitation work or other conservation projects.
Animal	Negative		• walk-through is recommended by a • The areas to be developed must be precisely demarcated to prevent the movement of staff or any individual into the surrounding environments, signs must be put up to enforce this • Noise must be kept to an absolute minimum at night to minimise all possible disturbances to amphibian species and nocturnal mammals

Aspect	Impact	Impact Description	Mitigation Measures
			• No trapping, killing, or poisoning of any wildlife is to be allowed; signs must be put up to enforce this. • Outside lighting should be designed and limited to minimise impacts on fauna. All outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapour lighting should be avoided, and sodium vapour (green/red) lights should be used wherever possible. • Schedule activities and operations during the least sensitive periods to avoid migration, nesting and breeding seasons. • All areas to be developed must be walked through prior to any activity to ensure no nests or fauna species are found in the area. Should any Species of Conservation Concern not move out of the area or their nest be found there, a suitably qualified specialist must be consulted to advise on the correct actions to be taken. • Ensure that cables and connections are insulated successfully to reduce electrocution risk.
Wetland	Negative	The impact assessment identified the destruction of wetland habitat and surface water pollution, including • sedimentation and increased erosion,	Several general and specific mitigation measures were proposed to reduce negative impacts and incorporate

Aspect	Impact	Impact Description	Mitigation Measures
		• altered hydrological regimes, spread of invasive species, and • decreased downstream water quality as an impact during the construction and operational phases. • The spread of invasive species and decreased downstream water quality are major impacts during the construction and operational phase.	potential positive impacts from the proposed development. • A thorough wetland monitoring program must be designed and implemented before the start of the construction phase to ensure any negative impacts are detected and mitigated appropriately and timeously • An effective freshwater ecosystem buffer zone must be established before any construction activities, including wetland and/or riparian habitat habitats. The determined freshwater ecosystem buffer of 35m must be implemented on all watercourses. • Watercourse crossings should be minimised and designed perpendicular to the watercourse flow. Low-water bridges with permeable bases should be designed where appropriate and implemented to avoid concentrating flows. Flows exiting the bridge on the downstream side of the bridge should be diffused and span more than 80% of the width of the watercourse. They should be strictly enforced and appropriately managed. • The construction of surface stormwater drainage systems during the construction phase must be done to protect the quality and quantity of the downstream

Aspect	Impact	Impact Description	Mitigation Measures
			system. Active rehabilitation throughout the study area, particularly in buffer zones and wetlands themselves, should be initiated before the start of construction. Active rehabilitation to the graminoid layer within areas with low basal cover includes reseeding, grazing exclusion, species diversification to be more resilient, and increased monitoring for these sections. It is highly recommended that dense matts of *Pennisetum thunbergii* be planted within the buffer zones and any preferred drainage line or flow path, especially areas with low basal over and or areas • exhibiting erosional processes, albeit even just slightly.
Avifauna	Negative	Possible impacts on avifauna during the construction and operational phases and their sources associated with the proposed development. The installation of the proposed Renewstable®Qhakaza project and ancillary infrastructure will require clearance of grazed but natural grassland vegetation during the construction phase. Most of the site will comprise solar PV arrays during the operational phase. Therefore, the main impact relating to avifauna will be the loss of natural habitat and the displacement of species, including gregarious species. Other possible direct impacts include possible	The following recommendations are intended to guide the positioning of the proposed infrastructure and layout: • All natural drainage lines and wetlands must be avoided, including the buffer recommended by the aquatic and/or wetland specialist/s. • If possible, the natural grassland habitat in western section should be avoided. This would contribute to minimisation of impacts for natural grassland on the site. If not possible, then strict mitigation and restoration actions would apply.

Aspect	Impact	Impact Description	Mitigation Measures
		collisions of priority species moving through the area with panels and power lines during the operational phase. Possible indirect impacts include the spread of invasive alien vegetation due to disturbance to the soil and potential contamination of the soil and downstream watercourses should chemicals be used to clean the panels. **Potential impacts to avifauna during the pre-/and construction phases** include the following: • Destruction of Indigenous flora and habitats (watercourses) during site establishment; • Potential loss of riparian vegetation/watercourses; • Loss/displacement of avifauna species potentially present on site; • Disturbance of local avifauna populations due to construction activities; • Loss of avifauna habitat due to vegetation clearance; • Contamination of the environment by hazardous materials; • Spread of invasive alien plant species; and • Disturbance and displacement of resident bird species. **Operational Phase**	• More information will need to be obtained through pre-construction monitoring. **Assessment Regime 1 should be followed with one peak season of monitoring included**. • Due to the nature of the landscape and the potential impacts on priority species, it will be important to conduct pre-construction monitoring according to the Best Practice Guidelines for Birds and Solar Energy (Jenkins et al., 2017) for assessing and monitoring the impact of solar power generating facilities on birds in southern Africa. **Other measures include:** • Construction activity should be restricted to the immediate footprint of the infrastructure. • Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of avifaunal species. • Furthermore, environmental good practices should be applied, such as ensuring strict control of staff, vehicles, and machinery on site and limiting the creation of new roads as far as possible. • Regarding habitat destruction, the recommendations of the ecological and botanical specialist studies must

Aspect	Impact	Impact Description	Mitigation Measures
		Potential impacts associated with the operational phase include the following: • Collision of avifauna with reflective surfaces of solar panels leading to injury or death • Collision and/or electrocution of avifauna with associated power lines • Disturbance of local faunal communities; and • Loss of habitat due to operational activities.	be strictly implemented, especially as far as limiting the construction footprint and rehabilitation of disturbed areas are concerned. • Should any nests or breeding sites be found during construction, suitable recommendations should be provided, and the EMPr must be amended. Mitigation measures must be implemented to reduce any potential direct and acute impact on avifaunal species.
Soil and Land Capability	Agriculture and Soils	The loss of topsoil in South Africa is a national concern, and thus, erosion control should be taken seriously. Soil erosion may occur during the construction phase due to: • Excavations, particularly on steep slopes • Ineffective stormwater management • Excessive use of gravel roads • Use of heavy machinery or vehicles Construction activities may lead to the compaction of disturbed soils; further, the exposure of the soil to environmental factors increases the likelihood of erosion. Removing surface vegetation will cause exposed soil conditions where rainfall and high winds can cause mechanical erosion. Rainfall and inadequate drainage systems would lead to sediments washing down into wetlands and rivers, causing sedimentation. In addition, hardened surfaces and bare areas	• If adequate soil erosion measures are implemented during the construction phase of the proposed activity, this impact can be deemed low significance. Where soils are highly erodible, adequate measures must be implemented to prevent undue soil erosion.

Aspect	Impact	Impact Description	Mitigation Measures
		will likely increase surface runoff velocities and peak flows received by riparian habitats and wetlands.	
Agriculture	Negative	The development footprint presents areas of active pasture utilised for grazing purposes, and some grass is harvested and used for stall feeding. These areas are critical for livestock farming within the study area and are regarded as important from an agricultural point of view. The loss of agricultural soils and the long-term change in land use will be localised within the study area. • The disturbance of original soil profiles and horizon sequences of these profiles during earthworks is a measurable deterioration in terms of erosion. This impact is localised within the development footprint. • Soil chemical pollution caused by potential oil and fuel spillages from vehicles is a moderate deterioration of the soil resource. • Soil compaction will be a measurable deterioration caused by heavy vehicles commuting on the existing roads and any newly constructed access road to increase access to the solar PV plant and the hydrogen plant. • The latter impacts will be localised within the site boundary with medium consequence and significance.	• Engage with local communities and stakeholders throughout the project's development to gather input, address concerns, and ensure the project aligns with community needs and priorities. • Implement policies prioritising hiring residents for construction and operational roles. • Establish training programs to equip local workers with the skills needed for the project. • Develop procurement policies that prioritise sourcing goods and services from local suppliers. • Work with local suppliers to build their capacity to meet the project's needs. • Create programs that offer alternative livelihoods for individuals affected by the displacement of agricultural activities, such as training in new skills and support for starting new businesses. • The project operations be kept within the demarcated footprint areas as far as practically possible to minimise edge effects.

Aspect	Impact	Impact Description	Mitigation Measures
		The project will significantly impact local agriculture. The project site is currently used for farming, and its development will bring about changes that can affect the local agricultural economy and the livelihoods of those involved in farming activities. **Displacement of Agricultural Activities**- The project site's current use of active pasture is utilised for grazing purposes, and some grass is harvested and used for stall feeding, implying that its development into a power plant will displace existing agricultural activities. This displacement will directly affect the cultivation of crops and the associated economic activities that support the local farming community. This will contribute to, amongst others. Identified impacts include • **Job Loss:** The cessation of farming activities will result in the loss of agricultural jobs, impacting farmworkers who rely on these positions for their livelihoods. • **Loss of Agricultural Land:** The conversion of agricultural land for industrial use will reduce the available farmland, which could impact local food production and the region's agricultural output. • **Economic Diversification and Support for Agri-Business**- The project provides an opportunity to diversify the local	• Avoid permanently impacting topsoil and subsoil but salvage the maximum depth of these when clearing areas for infrastructure. • Make use of geotextiles and contours to control soil erosion and revegetation of exposed soil surfaces where possible. • Construction vehicle movement should be limited to within the project perimeter fence to avoid unnecessary compaction of adjacent soils. • Always strip a suitable time before the placement or construction of the solar PV and hydrogen plant facilities, to avoid soil loss and contamination. • Access roads should be aligned with the existing road as much as practically possible to avoid further agricultural impact and unnecessary soil disturbance.

Aspect	Impact	Impact Description	Mitigation Measures
		economy by introducing industrial activities alongside traditional agriculture. This can reduce the region's economic dependence on agriculture and create new economic opportunities. • **Socio-Economic Impact on Farming Communities**—The project may have a socio-economic impact on farming communities, including shifts in employment patterns and changes in land use.	
Civil Aviation	Neutral	The proposed sub-project will not materially impact civil aviation radar, navigational, or communications infrastructure in the environs nor present additional material risks to operations at the affected aerodrome or within adjacent airspace.	• The proposed development and associated ground-based infrastructure is compliant with all relevant ICAO Annex 14 and SACAA (CARS and CATS) standards with respect to obstacle limitation surfaces and can, therefore, be supported for purposes of environmental approval. • The proposed development will not materially impact civilian radar, navigation, or communications infrastructure in the environs or present additional material risks to operations at Majuba Aerodrome.
Glint and glare	Neutral	The impact of glint and glare is considered low, and no mitigation is deemed necessary.	No mitigation is deemed necessary.
Palaeontology	Negligible	Based on the nature of the project, surface activities may impact the fossil heritage if preserved in the development footprint. The geological structures suggest that the rocks are	The Fossil Chance Find Protocol has been added to this report.

Aspect	Impact	Impact Description	Mitigation Measures
		the wrong type (volcanic) or only rarely contain fossil plants. Furthermore, the excavation material is soil, which does not preserve fossils. Since there is a small chance that fossils from the nearby Volksrust Formation may be disturbed, a Fossil Chance Find Protocol has been added to this report. Taking account of the defined criteria, the potential impact on fossil heritage resources is very low.	
Development	Positive	The Project has the potential to contribute to community infrastructure, including enhancements to roads, schools, and healthcare facilities through socio-economic development contributions. This contribution is envisioned to result in improved living conditions and increased access to essential services for the local population. This will include **Energy Infrastructure**: The project plant will enhance the reliability and stability of the local electricity supply, supporting residential, commercial, and industrial energy needs. **Energy Access and Affordability** The Project is poised to significantly improve energy access and affordability in Mpumalanga, the Local Municipality, and the broader Mpumalanga Province. The project addresses critical energy challenges by developing a reliable and cost-effective natural gas-fired power plant, ensuring that more	Develop strategies to enhance the identified positive impacts.

Aspect	Impact	Impact Description	Mitigation Measures
		residents and businesses benefit from stable and affordable electricity. **Regional Integration and Development** The proposed project will contribute to regional integration and development by enhancing energy security in the Local Municipality and establishing it as a key energy hub. It will also boost regional trade and investment by improving infrastructure along strategic routes like the Maputo Development Corridor, promoting economic growth and cooperation. Its impact extends beyond local benefits, fostering interconnected economies and supporting broader socio-economic development goals across Mpumalanga Province and beyond.	
Traffic	Negative	During the construction phase, increased heavy vehicle traffic will be expected. Without management, such increased traffic loads may negatively impact existing traffic flow. Further, unmanaged construction vehicles may decrease road safety for other road users, and uncontrolled movement of construction vehicles may result in unnecessary environmental impacts through vegetation and habitat destruction. The proposed site is adjacent to the N11, a major road leading to Volksrust. A new access road to the site will be constructed from the N11. Without mitigation, this impact	• The delivery of construction material and equipment should be limited to hours outside peak traffic times (including weekends) prevailing on the surrounding roads where possible; • Existing access roads must be used; • Delivery vehicles must comply with all traffic laws and bylaws; and • Inform communities of planned construction activities affecting vehicle/ pedestrian traffic.

Aspect	Impact	Impact Description	Mitigation Measures
		may be high; however, implementing mitigation measures may result in medium/low significance.	
Heritage	Neutral	The field survey identified no cultural heritage or archaeological resources within the area earmarked for the proposed development.	• The proposed development should be approved to proceed as planned under the observation that the proposed dimensions of the gas plant do not extend beyond the study area. • The footprint impact of the proposed development and associated infrastructure should be minimal to limit the possibility of encountering chance finds. • No burial sites (graves) were identified during the field investigation. However, should unidentified graves and burial sites be discovered during the cause of construction activities, all construction activities should cease. The site must be barricaded, and SAHRA/MPHRA or the professional archaeologist must be informed. • Should any unmarked burials be exposed during construction, affected families must be trekked and consulted, and relevant rescue/relocation permits must be obtained from SAHRA and the Mpumalanga Department of Health before any grave relocation can take place. Furthermore, a professional archaeologist

Aspect	Impact	Impact Description	Mitigation Measures
			must be retained to oversee the relocation process by following the National Heritage Resources Act 25 of 1999. • Should chance archaeological materials or human burial remains be exposed subsurface, construction work on any section of the development laydown sites, work should cease on the affected area, and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made. The overriding objective, where remedial action is warranted, is to minimise disruption in construction scheduling while recovering archaeological and any affected cultural heritage data as stipulated by the PHRA and NHRA reg. • If archaeological or other heritage relics deemed of high significance are found when physical works commence, heritage authorities will be advised immediately, and a heritage specialist will be called to attend.
Visual Impact	Negative	The visibility analyses will consider worst-case scenarios, using line-of-sight based on topography. Within the receiving environment, specific viewers (visual receptors) experience different views of the visual resource, such as the proposed	• Keep the construction sites and camps neat, clean, and organised to portray a tidy appearance. • Screen the construction camp and lay-down areas; rehabilitate disturbed areas around pylons as soon as

Aspect	Impact	Impact Description	Mitigation Measures
		plant, and value it differently. Viewers will be affected by the alterations of the views due to the proposed development. The construction and operation of the proposed power plant may visually impact users within the site's proximity. After mitigation, the visual effect for most users is expected to range between moderate and low. An advantage of the power plant is that it uses a renewable energy source to generate electricity. It does not emit harmful by-products or pollutants that may pose health risks to users or observers. The potential visual impact that motorists may experience during the construction phase is minimal. The construction camp will be behind the mine, with no roads, so the severity of visual impact will be low. The glint and glare of the solar panels could be a potential visual distraction and air travel hazard. The proposed solar farm is not located near any airport or airfield, so the significance of the potential visual impact is expected to be Low.	possible after construction to restrict extended periods of exposed soil. • Plant fast-growing endemic trees along the facility's boundary, especially along the N11. The trees will, with time, create a screen and increase the area's biodiversity. • Locate access routes to limit modification to the topography and to avoid the removal of established vegetation. • Utilise existing screening features, such as dense vegetation stands or topographical features, to place the construction camps and lay-down yards out of the view of sensitive visual receptors.
Air quality	Negligible	Decreased ambient air quality. The scale of the impact is related to whether the predicted ambient concentrations of	• Current industry-standard techniques should be supplemented with administrative control measures

Aspect	Impact	Impact Description	Mitigation Measures
		the pollutants exceed the limit values of the NAAQS in sensitive areas, i.e., residential or non-industrial areas. A detailed analysis of the impact of air quality will be undertaken during the EIA phase to determine the effects of the emissions on humans and the environment.	to maintain the residual impact at the nearest sensitive receivers at current background levels.
Wetland	Negative	The impact assessment identified the destruction of wetland habitat, surface water pollution, sedimentation, increased erosion, altered hydrological regimes, and spread of invasive species. It decreased downstream water quality as the major impacts during the construction and operational phase.	• Several generals and specific mitigation measures were proposed to reduce negative impacts and • incorporate some potentially positive impacts from the proposed development. Considering the erosive nature of the smectic clays on the terrain, erosion and sedimentation represent a very high risk in the study area; however, these aspects are mitigatable through maintaining appropriate basal cover.
Groundwater	Negative	• A high concentration of total coliform bacteria above the SANS limit was found in groundwater. Although the concentration is not disease-forming, it is therefore recommended that groundwater be chlorinated before consumption. Groundwater levels within the project area mimic surface topography, which suggests that groundwater flow will follow topographic elevations from high to low topographic regions. The main contamination pathways identified within the study area are Runoff and	

Aspect	Impact	Impact Description	Mitigation Measures
		infiltration through soil or vadose zone, Groundwater or aquifer and Surface water or streams.	
Surface Water	Negative	Due to the dolerite deposit, shallow groundwater discharging into low-lying areas and streams may affect surface water quality. The anticipated impacts on surface water include contamination due to discharge of unsuitable quality, system failure, stormwater, overflow, spillage, and runoff. Establish and implement stormwater management options. Prevent hydrocarbon spillage. Store hydrocarbons in a designated area. Prevent erosion from occurring. Prevent dam overflows. Separate dirty and clean stormwater and runoff. Collect all dirty runoff and stormwater. Prevent hydrocarbon spillage. Rehabilitate impacted area/soil, excavate, and remove hydrocarbon spillage. • Although groundwater's potential to meet the required total demand is low, groundwater may still provide a certain percentage of the requirement. Where the borehole is drilled correctly, yield may improve and provide sufficient volume.	• No activities should occur in the watercourses and associated buffer zone; where unavoidable, it must be subjected to necessary approvals from DWS (Water Use License) and related recommendations. • A temporary fence or demarcation must be erected around No-Go Areas before any construction occurs as part of the contractor planning phase when compiling work method statements to prevent access to the adjacent portions of the watercourse. • Effective stormwater management should be a priority during both the construction and operational phases and monitored as part of the EMPr. • No activities should occur within 100m or a 1:100-year flood line, whichever is greater, without approval from DWS. • Care must be taken during construction to prevent leaks and spillage of materials that may detrimentally affect water quality (especially fuels and chemicals).
Climate change impact	Negative	• Construction operations will probably include mobile and stationary diesel combustion emissions.	

Aspect	Impact	Impact Description	Mitigation Measures
		• Renewstable®Qhakaza GHG emissions include Scope 1, Scope 2, and Scope 3 emissions. Scope 1 emissions include emissions from stationary combustion of natural gas and diesel. Scope 2 emissions consist of emissions from purchased electricity. Scope 3 includes emissions from mobile diesel combustion contracted to third-party suppliers. • The magnitude of the impact of GHG emissions from the construction operations was estimated to be negligible. The project's GHG emissions will likely contribute to anthropogenic climate change, which will likely be accelerated and extended as GHG emissions accumulate in the atmosphere. Based on the climate threat outline, potential climate risks include increased temperature, reduced rainfall, extreme events, and wind impacts. Increased temperature and heat waves can pose a health risk to employees, influence productivity, and reduce plant efficiencies and available generation capacity.	• Allocating responsibility to key individuals for managing and reporting on the GHG performance of the plant. • Communicate the plan, including its key objective and any actions being taken, to staff working at the plant to ensure buy-in. • Encourage employee participation in the GHG management plan, including contributing ideas about improvement opportunities. • Reporting progress over time with respect to annual gas consumption and GHG emissions, GHG reductions/heat rate improvements achieved, and progress against targets set.

12.3 PROJECT SOCIO-ECONOMIC RISKS AND MANAGEMENT STRATEGY

The sections above focus on stakeholder management during the authorisation process. They provide a guideline for ensuring that the principles of stakeholder management are regulated, transparent, and inclusive. This section addresses the potential social impact and variables associated with the project. It identifies the risks and proposes a strategy to ensure they are well managed.

The potential social impact variables identified in association with the proposed project are in accordance with Vanclay's list of social impact variables clustered under the following main categories as adapted by Wong (Vanclay, 2002; Wong, 2013) and include:

1. Health and social well-being
2. Quality of the living environment (Liveability)
3. Economic
4. Cultural.

These categories are not exclusive and sometimes tend to overlap, as specific processes may impact more than one category.

The construction phase may impact the surrounding landowner if not properly managed. Other social-related issues may include the following:

- As a result of perceptions around job creation, increased expectations around employment opportunities may be created.
- Influx as a result of expectations around job and supply chain opportunities, resulting in pressure on land, social services, relationships, and other social infrastructure.
- Access to private, more accessible business sites will be easier, resulting in potential criminal intrusion, including theft, in private areas.

The socioeconomic aspects have both positive and negative impacts. The significance of positive socioeconomic benefits associated with the proposed development exceeds the significance of negative socioeconomic impacts. The proposed project will result in the creation of employment opportunities and procurement of goods and services. The negative socioeconomic consequences of the project include the loss of crop fields and grazing land, disruption of farm activities and social networks, and health and safety. These social risks are of medium significance but can be reduced to low with proper mitigation.

The table below identifies risks and refers to management strategies that must be developed. This includes the EMPr developed in the EIA phase and the developers' policies and procedures for managing the identified risks. The following documents must be consulted to address the identified risks:

- EMPr ; and

- HDF-Energy policies and procedures.

Table 46: Socioeconomic Impacts

Risk category	Risks Identified	Status	Description	Proposed Mitigation and Management Strategy
Socio-Economic	Employment	Positive Impact -Not mitigative require. Measure to enhance are proposed.	The Renewstable®Qhakaza offers numerous economic benefits and opportunities that are poised to drive substantial growth and development in the local and regional economies of Pixely Ka Seme Local Municipality and the broader Mpumalanga Province. By creating jobs, bolstering local enterprises, enhancing infrastructure, and encouraging economic diversification, the project is set to foster a more prosperous and resilient community. The project aligns with broader regional and national development goals by stimulating economic growth, improving infrastructure, and promoting environmental sustainability. Its comprehensive approach to economic and social development ensures that the benefits are widely shared, paving the way for a more prosperous, resilient, and inclusive future for the local community and the broader region. Providing employment opportunities during the construction and operational phases. **Direct Employment:** Further permanent jobs will be created during the plant's operations phase. Project	• The proposed Renewstable®Qhakaza is on farmland used for stock and crop farming. The project's development will necessitate repurposing this agricultural land, leading to the loss of these jobs. A strategy should be developed to mitigate the impact, including re-employment opportunities within the project, training programs for new roles, and compensation packages. • Engaging with the affected workers is essential to address their concerns and explore alternative employment opportunities, ensuring their continued economic stability and contribution to the local community. • The project also manages local communities' expectations regarding job opportunities, ensuring transparency and inclusivity throughout employment. Recognising the importance of community engagement and the high demand for local jobs, the project actively communicates the nature, scope, and timeline of employment opportunities to the residents. This involves

Risk category	Risks Identified	Status	Description	Proposed Mitigation and Management Strategy
			construction will be managed by a local or international engineering, procurement, and construction contractor (EPC) that will subcontract most of the local workforce. The construction phase is estimated to provide temporary employment to up to 300 people, while the operational phase will employ up to 35. The combined opportunities for the Majuba Cluster will have approximately 1800 and 270 opportunities during construction and operation, respectively. **Indirect Employment**: The project will also generate indirect employment opportunities through the demand for goods and services related to the construction and maintenance of the power plant, benefiting local businesses and service providers. The combined opportunities for the Majuba Cluster will have approximately 405 and 2700 opportunities during construction and operation, respectively. **Strengthen local economic development:** The Project will likely increase the region's expendable income through wages/ salaries and the potential for growth of local suppliers/ contractors. Lastly, the increase in expendable income may increase the potential for	setting realistic expectations about the types of jobs available, the skills required, and the duration of employment, whether during the construction or operational phases. • Renewstable Mpumalanga must promote the creation of employment opportunities for women and youth. Positions reserved for youth and women may only be filled by persons outside these categories if it can be demonstrated that no suitable persons can be employed.

Risk category	Risks Identified	Status	Description	Proposed Mitigation and Management Strategy
			secondary business opportunities in the local market. The project will create approximately 5175 direct and indirect opportunities.	
Health and social well-being	Air quality	Negative	Dust impacts from the proposed project activities are likely to be concentrated within the site of these facilities. The impact will be negligible; however,	• Implement measures proposed in the EMPr.

Risk category	Risks Identified	Status	Description	Proposed Mitigation and Management Strategy
			dust management measures must be included in the EMPr.	• Appoint a community liaison officer to deal with complaints and grievances from the public. • Dust-reducing mitigation measures, including dust suppressants, must be implemented and strictly adhered to. • No non-environmentally friendly suppressants may be used as this could result in water pollution.
	Noise	Negative	Noise-generating activities on site include the following: • Earthworks; • Delivery of building material; • Civil construction activities; • Earth drilling; • TLB activities; • Foundations and pouring of concrete. During construction, an increase in noise is expected as these activities will generate noise of medium significance without mitigation. If the mitigations are adhered to, the noise impact will be manageable and of low significance.	• Maintain all vehicles and construction machinery to ensure the noise levels do not cause unnecessary and avoidable nuisance to the workforce and local communities. • Appoint a community liaison officer to deal with complaints and grievances from the public. • Manage speed limits of vehicles and ensure all vehicles are maintained to reduce noise. • Ensure that all construction equipment is well serviced per the manufacturer's manual throughout the construction phase. • The Noise Control Regulations (2013) requirements must be adhered to.

Risk category	Risks Identified	Status	Description	Proposed Mitigation and Management Strategy
			Noise can impact the health and social well-being of local communities. The proposed expansion will not significantly affect ambient noise levels, as it occurs with the existing and operational rail corridor. However, the noise impact on surrounding communities must be monitored, and measures must be included in the EMPr for both the construction and operational phases.	
	Hazard Exposure	Negative	The use of heavy equipment and vehicles and an increase in vehicle traffic near the construction site will increase the risk to the personal safety of people and animals. Construction workers lighting fires for cooking and warmth during cold periods also pose a risk of fires. Successful implementation of the recommended mitigation measures will result in these risks remaining acceptable; such measures will be included in the EMPr.	• During construction, the sites should be fenced off to prevent access. • Fencing should be inspected regularly and properly maintained by the contractor. • Ensure that the appropriate warning signs are erected on all boundary fences, cautioning against entering the construction area. • Ensure all construction equipment and vehicles are correctly always maintained. • Ensure operators and drivers are properly trained and make them aware, through regular toolbox talks, of any risk they may pose to the community. Place specific

Risk category	Risks Identified	Status	Description	Proposed Mitigation and Management Strategy
				emphasis on the vulnerable population sector, such as children and the elderly. • Ensure that fires lit by construction staff are only ignited in designated areas and that the appropriate safety precautions, such as not lighting fires in strong winds and completely extinguishing fires before leaving them unattended, are strictly adhered to. • Make staff aware of the dangers of runaway fire during regular toolbox talks.
	Waste		The inhibition of the site and related construction activities will result in waste generation.	• Compilation of and implementation of an alien vegetation management plan for the project area • The footprint area of the construction should be kept to a minimum and demarcated to avoid unnecessary disturbances to adjacent areas. • The footprint of the roads must be kept to the prescribed widths. • Waste management must be a priority, and all waste must be collected and stored adequately. It is recommended that all waste

Risk category	Risks Identified	Status	Description	Proposed Mitigation and Management Strategy
				be removed from the site weekly to prevent rodents and pests from entering the site • A pest control plan must be put in place and implemented; it is imperative that poisons not be used due to the likely presence of SCCs
	Increase in crime	Negative	After public engagement, perception and heightened expectations for job opportunities will become apparent. Subsequently, an influx of job seekers could result in an increase in crime in the area. This risk is more likely to be higher during construction and associated with opportunistic criminal activities. The operational may continue experiencing a certain level of crime relating to movables, cables, etc.	All workers should carry identification cards and wear identifiable clothing. • Fence off the construction site and control access to the site. • Appoint an independent security company to monitor the site. • Encourage local people to report any suspicious activity associated with the construction site to the security company. • If applicable, liaise with the Community Policing Forums near the project.
	Influx of job seekers	Negative	The construction activities will likely result in an influx of job seekers, particularly given the country's current unemployment rate. This impact can be significant and requires a proper recruitment management strategy.	• Communicate, through Community Leaders and Ward Councillors, the situation regarding job opportunities created by the project.

Risk category	Risks Identified	Status	Description	Proposed Mitigation and Management Strategy
				• Develop and implement a local procurement policy that prioritises "locals first" to prevent the movement of people into the area in search of work. • Develop a project recruitment policy with Community Leaders and Ward Councillors and ensure compliance. Cooperate with local authorities to ensure all legislation preventing illegal settlement is consistently enforced.
	Increased risk of Transmittable Disease Infections	Negative	The risk of infections would be highest during the project's construction phase, as the construction workforce increases and exposure increases.	Awareness Raising
Quality of the living environment (Liveability)	Annoyance factor, access, and disruption of daily living patterns, particularly in remote farmlands.	Negative	The disruption of daily living patterns is most likely associated with construction activities related to irregular on-site deliveries and the use of construction vehicles and equipment. These disruptions will likely subside somewhat over the project's operational phase as operational schedules and traffic patterns become more predictable.	Appoint a community liaison officer to deal with complaints and grievances from the public. Monitor the effect of construction activities on public infrastructure regularly and immediately report any damage to the appropriate authority.

Risk category	Risks Identified	Status	Description	Proposed Mitigation and Management Strategy
	Increased traffic due to construction activities	Negative		Implement the mitigation measures in the EMPr and SES.
Economic	Job creation and skills development	Positive	The project will likely result in the following economic benefits: • Job creation and skills development • Local economic development.	Appoint a community liaison officer to deal with complaints and grievances from the public. Wherever feasible, residents should be recruited to fill semi and unskilled jobs. Women should be given equal employment opportunities and encouraged to apply for positions. A skills transfer plan should be established early, and workers should be allowed to develop skills that they can use to secure jobs elsewhere post-construction.
Cultural	At a social level, any cultural impacts would likely be associated with sensitive archaeological and/or heritage sites that may be found.	Negative	At a social level, any cultural impacts would likely be associated with sensitive archaeological and/or heritage sites that may be found. In this regard, a desktop heritage study was undertaken, and recommendations were made, which are included in Section 6 above.	• Chance Find Protocol • EMPr

12.4 CUMULATIVE IMPACTS

In reference to the scope for an impact assessment, IFC's Performance Standards specify that: *"Risks and impacts will be analysed in the context of the project's area of influence. This area of influence encompasses…areas potentially impacted by cumulative impacts from further planned development of the project, any existing project or condition, and other project-related developments that are realistically defined at the time the Social and Environmental Assessment is undertaken; and (iv) areas potentially affected by impacts from unplanned but predictable developments caused by the project that may occur later or at a different location. "(IFC 2006).* As indicated above, the overarching legislation governing the EIA process within a South African context (i.e., NEMA) also requires considering cumulative impacts within the EIA process.

Cumulative impacts in relation to an activity are defined in the EIA Regulations (Government Notice R543) as the past, present, and reasonably foreseeable future impacts of an activity, considered together with the impacts of activities associated with that activity that may not be significant but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities (DEA, 2014 EIA Regulations).

In line with the government initiatives detained in the project's motivation, projects similar to the proposed have become common in the broader region and the province. They are earmarking the ROMPCO gas pipeline along the N4. A similar project identified is the Komatipoort SEZ Gas project, which is 40km away. The summary of local and regional challenges the local and district municipality faces is limited to key considerations related to this Project. It is not limited to what is identified below.

The local and regional challenges currently being experienced by the local and district governments have been divided based on key planning documents. A summary of some of the key challenges experienced has been identified based on a review of the following documentation:

- Mpumalanga Provincial Growth and Development Strategy, which is part of the Mpumalanga Vision 2030 Strategic Implementation Framework
- Mpumalanga Industrial Development Plan (2016)
- Gert Sibande District Municipality Local Economic Development Strategy
- Dr Pixley Kas Sememe Integrated Development Plan

For decision-makers to consider projects within the spatial context of other known and planned developments, sustainable development is imperative. The DFFE guideline for renewable energy projects sets the spatial extent for the EIA cumulative assessment, stating that other similar large-scale projects must be considered within a 30km radius of the application. Large-scale infrastructure identified within a 30km radius of the project includes:

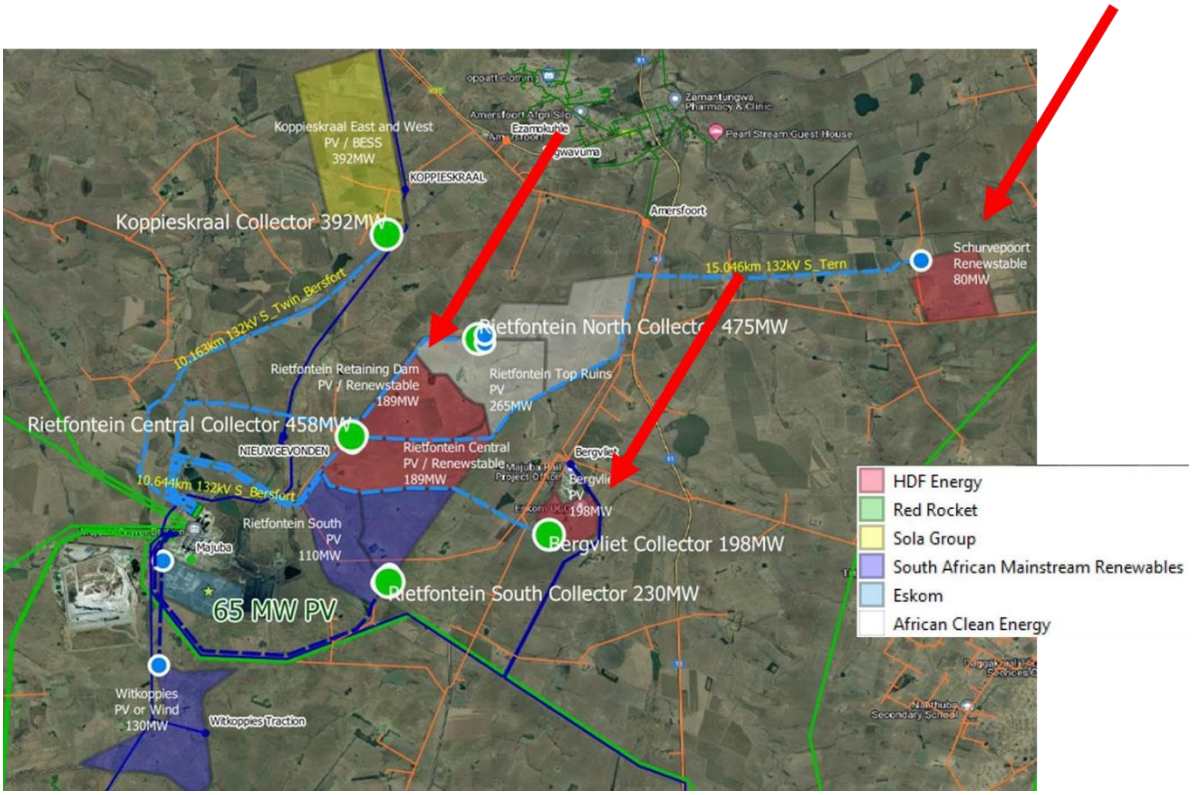


Figure 49: Other Renewable Energy Projects in the Area

Considering the above-referenced documents and the current economic climate and global recession, significant strides have been made to address the key development challenges in the Municipality. As indicated by the IDP, there is some distance to go towards addressing the challenges. The Table below only focuses on project-related challenges.

Table 47: Cumulative Impacts

Challenges	Description	Applicability to the project
High rates of unemployment and low economic growth	Similar to other municipalities in the country, the municipality faces a challenge regarding a marketable and skilled workforce, thereby creating a productivity gap that negatively impacts economic growth. Limited efforts to encourage the development of the green economy and the development of infrastructure to support economic development will, in the future, stifle opportunities to reduce the high levels of unemployment.	Providing employment opportunities during the construction and operational phases. **Direct Employment:** Proposed wording in SIA: During the plant's operations phase, further permanent jobs will be created. Project construction will be managed by a local or international engineering, procurement, and construction contractor (EPC) that will subcontract most of the local workforce. The construction phase is

Challenges	Description	Applicability to the project
		estimated to provide temporary employment to up to 300 people, while the operational phase will employ up to 35. The combined opportunities for the Majuba Cluster will have approximately 1800 and 270 opportunities during construction and operation, respectively. **Indirect Employment**: The project will also generate indirect employment opportunities through the demand for goods and services related to the construction and maintenance of the power plant, benefiting local businesses and service providers. The combined opportunities for the Majuba Cluster will have approximately 405 and 2700 opportunities during construction and operation, respectively. **Strengthen local economic development:** The Project will likely increase the region's expendable income through wages/ salaries and the potential for growth of local suppliers/ contractors. Lastly, the increase in expendable income may increase the potential for secondary business opportunities in the local market. The project will create approximately 5175 direct and indirect opportunities.
Low levels of skills development and literacy	There is an urgent need to improve and transfer scarce skills to the citizens of Nkomazi. The Municipality is responsible for improving the community's literacy levels and ensuring an adequate skills base to foster enterprise growth and job	**Skills Development:** Training and capacity-building programs associated with the project will enhance the local workforce's skills, improve employability, and support long-term economic resilience. This focus on skills development aligns with broader

Challenges	Description	Applicability to the project
	creation. This will assist the citizens in entering the competitive economic and manufacturing market.	regional goals of enhancing human capital and reducing poverty.
Increased incidents of HIV/AIDS and communicable diseases	HIV/AIDS is an epidemic which is increasing at an alarming rate and affects communities negatively. The provision of basic health services and adequate healthcare infrastructure, increased financial and human resources in healthcare, awareness and education and poverty alleviation programmes will reduce the increased incidents of HIV/AIDS and communicable diseases.	The expected influx of people could impact the spread of communicable diseases.
Loss of Natural Capital	Ecosystems and natural resources deliver essential environmental services (e.g. water supply, flood attenuation, climate control) that provide the foundation for human life and development. These resources are finite, so their protection and efficient use is essential if irreversible degradation and loss of the Municipality's biodiversity are to be avoided and if the sustainability objectives of the IDP are to be achieved. Habitat destruction (or land transformation) and invasive alien species are widely regarded as the greatest threats to biodiversity. Other threats include over-exploitation (e.g. medicinal plants) and climate change.	The ESIA seeks to address the loss of natural Capital by ensuring that developments are sustainable and in accordance with regulatory requirements.
Unsustainable developmental practices	The Municipality faces the challenge of reacting to urban sprawl, which, in turn, results in increased informal settlement, overcrowded schools, ill health, marked spatial disparities, higher cost of	The listed impacts have been identified, and specialist input has been sought to address them. The ESIA phase will present a detailed impact assessment with proposed mitigation measures.

Challenges	Description	Applicability to the project
	providing infrastructure and services, disturbed ecosystems, biodiversity and environmental resources, changes in air quality, change in aesthetics and urban form, and loss of land for economic and agricultural services.	
High levels of crime and risk	Strategies for addressing crime, including reactive strategies to respond to crime and proactive strategies to stop crime before it happens, are required. The response requires an integrated, multifaceted approach that includes working closely with communities, the National and Provincial Governments, other stakeholders, and service providers in all areas of crime prevention.	As noted in the influx map presented on Vision 2030, some municipalities in Mpumalanga are already experiencing an influx of people searching for opportunities. This will likely be the case for the GSDM and its local Municipalities, particularly with the numerous renewable energy projects in the district.
Ensuring adequate energy and water supply	The unsustainable use of resources such as energy and water have significant environmental impacts. It will ultimately compromise the Municipality's energy security and ability to deliver water of adequate quality and quantity to its citizens. Unsustainable resource use is a direct consequence of overproduction and consumption. Demand-side management is critical to ensuring a more sustainable use of resources. In the case of water, whole catchment management (including areas outside of the municipal area) and efficient nature conservation programmes will help ensure an adequate supply of clean water in the Municipality. The most sustainable solution to the energy crisis is to reduce the energy demand and, at the	A key challenge for the local and district municipalities is service delivery. The provision of essential services such as water, sewerage, power, and housing has been an ongoing problem in the region. Several of the region's planning documents have identified basic service delivery as a key issue. The expected increase in employees (and associated family members) resulting from the Project and a possible influx of work seekers will strain Volksrust, Amersfoort, and the surrounding towns' existing health and education facilities. The proposed project, however, is a solution to what the IDP highlighted as an

Challenges	Description	Applicability to the project
	same time, investigate alternative renewable energy sources.	energy challenge, as it offers alternative energy despite not being renewable.
Infrastructure degradation	Degradation has become a critical social problem, with effects such as flooding in the municipal area due to unexpected heavy rain. Therefore, it is critical that the Municipality manages its assets, mitigates climate change, and ensures infrastructure life cycle management, thus ensuring value for money.	The project recognises climate change and associated weather challenges, which will be considered in the design and maintenance plan. Furthermore, the sustainability of the gas supply has also been investigated to ensure the project's long-term sustainability.

12.4.1 Waste Generation

During the construction phase of the proposed Renewstable® Qhakaza, various waste streams will be produced within the proposed development. Most of this waste will end up at municipal landfill sites.

12.4.2 Visual Impact

The proposed activity will change the area's visual character, particularly considering that the proposed site is next to the national road (N11). Given the topography and the proximity to the national highway, the impact can be considered term definite and long-term.

12.4.3 Traffic Impact

During the construction phase, increased heavy vehicle traffic should be expected. There are anticipated disruptions on the N11 during construction. Without management, such increased traffic loads may negatively impact existing traffic flow. Without appropriate traffic management during the gravel road access construction, motorists using the National Road will be significantly affected. Furthermore, unmanaged construction vehicles may decrease road safety for other road users, and uncontrolled movement of construction vehicles may result in unnecessary environmental impacts through vegetation and habitat destruction.

12.4.4 Soil and Land Capability

The loss of agricultural soils and the permanent change in land use will be localised within the study area; the cumulative loss of agricultural resources locally and regionally is moderate without mitigation and low with mitigation

measures. The specialist believes that the unmitigated scenario threatens the sustainability of high-potential agricultural soils. Therefore, integrated mitigation measures must be implemented accordingly to minimise the potential loss of these valuable soils, considering the need for sustainable development.

12.4.5 AGRICULTURE

The loss of agricultural soils and the long-term change in land use will be localised within the study area. Although the loss of agricultural soils and the permanent change in land use will be localised within the study area, the cumulative loss of agricultural resources locally and regionally is considered Moderate without mitigation and Low with mitigation measures. The project will significantly impact local agriculture. The project site is currently used for farming, and its development will bring about changes that can affect the local agricultural economy and the livelihoods of those involved in farming activities.

12.4.6 BIODIVERSITY IMPACT

Whilst every effort is made to cover as much of the site as possible, representative sampling was completed as per the nature of this type of investigation. Therefore, it is possible that some plant and animal species on site were not recorded during the field investigations. An in-depth Avifauna investigation is not included in this report.

Every effort is made to identify all plant species present on-site during field investigations. However, this being the wet season, any winter flowering species would have been omitted from the field data.

This report lists the findings of an on-site baseline evaluation within the area selected by Eskom Majuba for the construction and operation activities of the PV facility and related activities. Where necessary, recommendations for the most appropriate mitigation measures have been included.

To obtain a comprehensive understanding of the dynamics of the biota on a site, including SCC, studies should include investigations through the different seasons of the year over several years and extensive sampling of the area. Due to the EIA process time constraints, such long-term research was not feasible, and the information contained within this report is based on a late wet season field survey.

In terms of limitations relevant to this study, it must be noted that field investigations did not include a nocturnal survey for safety reasons; therefore, nocturnal species were not recorded by this means. Furthermore, the prevailing temperature was low during the site investigation, with persistent rainfall and hail. This could have influenced the behaviour of reptile species and meant they might not have been as active.

6.2.1 WATER RESOURCE IMPACT

The cumulative impacts of developments within the watercourses will cause an increase in surface water runoff and decrease infiltration, potentially increasing erosion potential and sedimentation. The development of a comprehensive surface runoff and sensitive stormwater management plan is therefore required, indicating how all

surface runoff generated because of the development (during both the construction and operational phases) will be managed (e.g. artificial wetlands/stormwater and flood retention ponds/ attenuation and diffuse release mechanisms) before entering any local/regional drainage system. This plan should, therefore, indicate how surface runoff will be retained and subsequently released to simulate natural hydrological conditions. Further, special care must be taken regarding the design, construction, and maintenance of linear infrastructure, e.g. cabling, water, and sewage infrastructure, as the smectic clays on site can cause severe damage to especially linear infrastructure due to the swelling and shrinking properties.

13 PLAN OF STUDY FOR EIA

The scoping phase is fundamental as it identifies potential environmental impacts and facilitates compiling the EIA and Environmental Management Programme (EMPr). This report incorporates information from the client, specialist studies, site visits, literature reviews, and previous environmental studies conducted in the area; therefore, it provides a comprehensive baseline of the study area's environment.

This scoping process followed the appropriate standards and procedures for the EIA application, as set out in the NEMA and the 2014 EIA Regulations. The study includes a description of the various alternatives and indicates those alternatives which should be pursued as part of the detailed assessment of the ESIA process. The impact significance of the proposed activity on the environment will be assessed in the EIA phase (described below) with the assistance of various specialist studies.

This section outlines how the ESIA for the proposed development will proceed during the EIA phase. The detailed assessment phase of the EIA process entails integrating the specialist studies for those potential impacts evaluated to be of significance. Relevant mitigation measures will be included in the EMPr. This section provides specific terms of reference and impact assessment methodology for utilisation by the specialist team and EAP. The Plan of Study for EIA is intended to summarise the key findings of the Scoping Phase and describe the activities undertaken during the impact assessment. The Plan of Study provides the following:

- A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity.
- A description of the aspects to be assessed in the environmental impact assessment process.
- Aspects to be assessed by specialists.
- A description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists.
- A description of the proposed method of assessing duration and significance.
- An indication of the stages at which the competent authority will be consulted.
- Particulars of the public participation process will be conducted during the EIA process.
- A description of the tasks that will be undertaken as part of the EIA process and
- Identify suitable measures to avoid, reverse, mitigate or manage identified impacts and determine the extent of the residual risks that need to be managed and monitored.

13.1 A DESCRIPTION OF THE ASPECTS TO BE ASSESSED AS PART OF THE ENVIRONMENTAL IMPACT ASSESSMENT

The following aspects have been identified and described as part of the Scoping Report.

- Wetland and Aquatic Assessment
- Heritage Impact Assessment

- Agricultural Impact Assessment
- Terrestrial and Aquatic Biodiversity Assessment (Including Herpetofauna)
- Paleontological Assessment
- Civil Aviation Verification and Glint and Glare
- Avifauna Impact Assessment
- Social Impact Assessment and Tourism
- Visual Impact Assessment
- Traffic Impact Assessment

The assessment was compiled in accordance with the requirements of the *Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes when Applying for EA* (GN R320 of 2020) and comply with the following gazetted protocol, which replaces the requirements of Appendix 6 of the EIA Regulations, 2014 (as amended) in terms of NEMA: *Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Animal Species* (GN 1150 of 30 October 2020) as amended 28 July 2023.

13.2 ASPECTS TO BE ASSESSED BY THE SPECIALISTS

The following specialist studies will be undertaken during the EIA phase.

Table 48: List of specialist sub-consultants

Specialist Study	Company	Specialist	Screening Tool	SSV OUTCOME
Draft Reports /SSV Reports completed and attached.				
Wetland and Aquatic Assessment	WaterMakers	Willem Lubbe		
Heritage Impact Assessment	AHSA	Edward Matenga		
Agricultural Impact Assessment	Nsovo Environmental Consulting	Tshiamo Setsipane		
Terrestrial Biodiversity Assessment	Amanzi Environmental Services	Rudi Greffrath		
Plant theme				
Animal				
Paleontological Assessment	Bamford (Pty) Ltd	Dr. Marion Bamford		

Specialist Study	Company	Specialist	Screening Tool	SSV OUTCOME
Civil Aviation Verification	GWI Group	Jon Heeger		
Glint and Glare				
RFI				
Visual Impact Assessment	Outline Landscape Architects	Katherine Hammel-Louw		
Defence	Nsovo Environmental			
Avifauna Impact Assessment	Cossypha Ecological	Robyn Phillips		
Herpetofauna	Mboneni Ecological Services	Avhafarei Phamphe		
Traffic Impact Assessment	Traffic Surveys	Pieter Joost		
Social Impact Assessment and Tourism	The Mana Holdings	Vhahangwele Manavhela		
Included in the Plan of Study to be completed during the EIA Phase				
Noise and Vibration Specialist	DB Acoustics	Barend		
Major Hazard Installation	ISHECON	-		
Air Quality and Climate Change Impact	EHRCON	Uno Neveling		

All specialist studies will be prepared per Appendix 6 of the EIA Regulations 2014 as amended and undertaken by qualified, experienced, and registered specialists. The specialist studies will take into consideration the Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes in terms of Section 24(5) (a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation ("the Protocols") promulgated in Government Notice ("GN") No. 320 on 20 March 2020, which came into effect on 09 May 2024.

Table 49: Specialist Terms of Reference

Aspect	Company Responsible	Scope of Work / Terms of Reference
Air Quality Assessment	EHRCON	The impact assessment phase of the study will include the following: • The compilation of an emissions inventory comprising the identification and quantification of potential sources of • emissions due to the project; Dispersion simulations of all potential pollutants from the project for applicable averaging periods • Evaluation of the potential for human health impacts; and, • Determination of environmental risk • Propose Mitigation Measures
Noise Assessment	Db Acoustics	The following will be included in the environmental noise impact assessment study: • Compilation of project source term. • Attenuation modelling of all potential noise sources due to project operations. • Evaluation of potential noise impacts on human receptors due to project activities; and, • Determining environmental noise risk according to the EIMS stipulated Impact Assessment methodology.
Climate Change Assessment	EHRCON	The impact assessment will include the following information: • An estimation of the CO_2-equivalent emissions from the project, associated fuel use, vegetation clearing activities (if applicable), and electricity use. • Estimate the impact of the project on national greenhouse gas emissions. • Evaluation of the potential impact of global climate change on the project by identifying potential physical risks to the project, employees, and communities. • Provide the potential risk of climate change on the project and the risk of the project on climate change. • Determination of environmental risk according to stipulated Impact Assessment methodology and, • Recommendation of mitigation and management measures, where applicable.

Aspect	Company Responsible	Scope of Work / Terms of Reference
		The climate change impact assessment report will consider Scope 1 emissions, which are directly attributable to the proposed project; Scope 2 emissions, which are the emissions associated with bought-in electricity over the project's lifetime; and Scope 3 emissions (as far as is reasonable and practically possible), which consider the "embedded" carbon in bought-in materials and downstream emissions.
Major Hazardous Installation Study	ISHECON	The scope of the risk assessment will include: • Review of revised Qhakaza technical designs. • Development of accidental spill and fire scenarios for the facility. • Using generic failure rate data (for tanks, pumps, valves, flanges, pipework, gantry, couplings and so forth), determination of the probability of each accident scenario; • For each incident developed, determination of consequences (such as thermal radiation, domino effects, toxic-cloud formation and so forth); • For scenarios with off-site consequences (greater than 1% fatality off-site), calculate the maximum individual risk (MIR), considering all generic failure rates, initiating events (such as ignition), meteorological conditions, and lethality; • Assessing the risk assessment to the criteria of SANS 1641, commenting on the suitability of the project; • Suggest mitigation, if possible, for successful implementation. This information will identify shortcomings and rank the risks for possible risk reduction programmes. The assessment results will be tabled in a document addressing some or all the topics listed in the MHI regulations, which would not be adequate for submission as an MHI risk assessment.
Socio-economic Assessment	Hangwi Manavhela	The following methodology is proposed: • The study will commence with a baseline description of the area, including a review of available literature. This will include relevant legislation, existing provincial and municipal documents and studies, and any additional literature that

Aspect	Company Responsible	Scope of Work / Terms of Reference
		applies to the study. This study will focus on the local and regional levels. • Necessary demographic data will be obtained from Stats SA and other available official documents. • A stakeholder identification and analysis will be conducted to inform the impact assessment and assist with planning the fieldwork. Fieldwork will be used to obtain additional information and communicate with key stakeholders. • Stakeholders typically include social structures such as ward councillors, municipal representatives, landowners, community representatives, farmer's associations, forums, and political leaders. Vulnerable stakeholders will be identified and consulted appropriately. • Information will be obtained via focus groups, formal and informal interviews, observation, immersions, in-the-moment discussion groups, the Internet, and literature reviews. Notes will be kept of all interviews and focus groups. • An interview schedule might be used instead of formal questionnaires. An interview schedule consists of a list of topics to be covered, but it is not as structured as an interview. It provides respondents with more freedom to elaborate on their views. • The final report will focus on current conditions, providing baseline data. Each category will discuss the current situation and investigate possible future impacts. • Recommendations for mitigation will be made at the end of the report. • The study will be participatory, which implies it will intensely focus on including the local community and key stakeholders. Participatory methods will be used to identify local economic development projects. • Impacts will be rated according to the prescribed impact tables, and risks will be calculated using social risk assessment methods.

Aspect	Company Responsible	Scope of Work / Terms of Reference
		Information obtained through the stakeholder engagement process will inform the writing of the report and associated documents.
Avifauna	Cossypha	The specialist SSV was completed, and verified the sensitivity as medium. Part of the recommendations included that due to the nature of the landscape and the potential impacts on priority species, it will be important to conduct pre-construction monitoring according to the Best Practice Guidelines for Birds and Solar Energy (Jenkins et al., 2017) for assessing and monitoring the impact of solar power generating facilities on birds in southern Africa. This will take the avifaunal assessment to Stage 2 – Data Collection, which includes structured and repeated data collection to base the impact assessment report and provide a baseline against which post-construction monitoring can be compared. The duration and scope of data collection are guided by the size of the proposed development and the preliminary assessment results, which verify the sensitivity of avifauna potentially affected by the proposed development. For the Qhakaza site, assessment Regime 1 would be the minimum requirement (see medium solar facilities 30-150 ha / 10-50 MW), with sampling conducted within the peak (summer) season.

13.3 A DESCRIPTION OF THE ALTERNATIVES TO BE CONSIDERED AND ASSESSED WITHIN THE PREFERRED SITE, INCLUDING THE OPTION OF NOT PROCEEDING WITH THE ACTIVITY

The scoping phase assessed technical alternatives for the Renewstable® Qhakaza facility identified in Section 7, including the "No-Go" alternative. These alternatives will be evaluated further during the ESIA phase. The preferred alternatives will have negligible environmental impact and provide the most socioeconomic benefits.

Alternatives to be assessed further include:

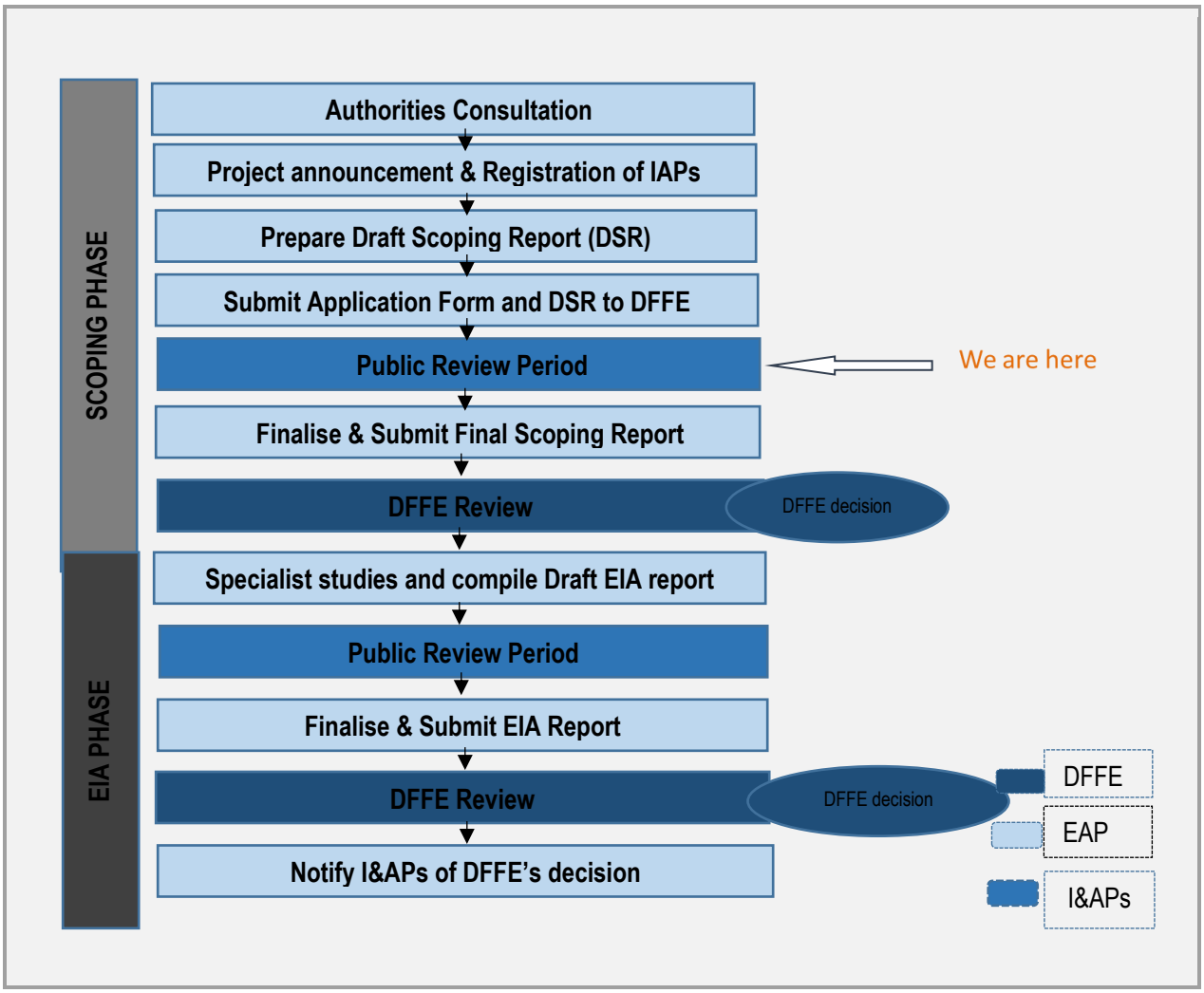
- Technical; and
- No Go Alternative

13.4 A DESCRIPTION OF THE PROPOSED METHOD OF ASSESSING THE ENVIRONMENTAL IMPACTS

The description of the proposed method of assessing the duration and significance is included in Section 11 above.

13.5 AN INDICATION OF THE STAGES AT WHICH THE COMPETENT AUTHORITY WILL BE CONSULTED

The different stages at which the Competent Authority will be consulted are presented below.



13.5.1 SCOPING PHASE

The draft Scoping Report will be submitted to the DFFE for review and comment. It will also be sent to all stakeholders for 30 days for review and comment, during which time comments or issues raised will be addressed appropriately. The final Scoping Report will also be submitted to the DFFE for consideration.

13.5.2 ENVIRONMENTAL IMPACT ASSESSMENT PHASE

The draft Environmental Impact Report (EIR) will be prepared and distributed for public review and comments. Copies of the draft EIR will be submitted to the DFFE and stakeholders for comment. The final EIR, including all comments received, specialist reports, and recommendations, will be submitted to the DFFE for decision-making.

13.6 PARTICULARS OF THE PUBLIC PARTICIPATION PROCESS THAT WILL BE CONDUCTED DURING THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The Public Participation approach adopted in this plan is in line with the process contemplated in Regulations 39 through 44 of the EIA Regulations of 2014 as amended in terms of the National Environmental Management Act, 1998 (Act 107 of 1998), and Annexures 2 and 3 of Government Notice No 43412 of 5th of June 2020. The Notice requires that the EAP must ensure that:

- All reasonable measures are taken to identify potentially Interested and Affected Parties (I&APs); and
- Participation by registered I&APs facilitated such that they have a reasonable opportunity to comment on the application.

Chapter 6, Regulation 39 through 44 of the EIA Regulations stipulates that the person conducting a public participation process must consider any relevant guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential I&APs of an application or proposed application that is subject to public involvement.

Public Participation principles hold that those affected by a decision have the right to be involved in the decision-making process. The primary objective of conducting the PPP is to provide I&APs with an opportunity to express their concerns and views on issues relating to the proposed project. The principles of public participation are to ensure that the PPP:

- Communicates the interests of and meets the process needs of all participants;
- Seek to facilitate the involvement of those potentially affected;
- Involves participants in defining how they participate; and
- It must be as inclusive and transparent as possible and conducted in accordance with the requirements of the Regulations as amended.

The database of stakeholders developed during the scoping process will be used to ensure that those stakeholders involved in the Scoping Phase also participate in the EIA phase. The database will also be expanded to include I&APs for review. The stakeholders will be allowed 30 days to provide their comments. The comments received will be incorporated into an updated Comments & Response Report (CRR).

Additional public consultation will occur in public and focus group meetings as appropriate. The purpose of the public meetings would be to present the findings of the draft EIR as well as the alternatives considered to the relevant stakeholders, registered I&APs, and the affected landowners. The EAP will use this forum to provide more information about the proposed development, including specialist input, and to allow the stakeholders to comment further on the proposed development. If the comments and issues highlight information that changes or influences the impact

evaluation provided in the draft EIR, the necessary amendments will be made to the report. The Final EIR will be submitted to the DFFE after the second public consultation phase.

13.6.1 Public Notification

The commencement of the EIA process, i.e., the Scoping Phase, will be advertised in two local newspapers. The proposed project will further be announced publicly through the following platforms of information sharing:

- Newspaper adverts promote the proposed development and location, provide contact details to obtain more information, and announce the availability of the draft EIA Report for review and comment.
- A2 site notices in English, Zulu, and Afrikaans will be placed at conspicuous locations along the study area and at the Local Municipality office within the proposed study area.
- Emails will be sent to key stakeholders.

Further advertising will take place during the EIA phase. It will relate to the reports' availability for public review and the announcement of public meetings at strategically located sites to allow maximum attendance.

13.6.2 Interaction with DFFE and Provincial Departments

Interaction with DFFE and other provincial authorities with jurisdiction over the proposed development undertaken during the Scoping Phase will continue into the EIA Phase of the project. Further interaction will occur in the following manner:

- Submission of the Final Scoping Report to DFFE;
- A consultation meeting with various stakeholders and I&APs, as appropriate, to discuss the findings of the draft EIR;
- Submission of the draft EIR following public review; and
- Notification of registered I&APs of the EA once it is issued.

I&APs, authorities, and key stakeholders will review the draft EIR. The report will also be published and available on the Nsovo (EAP) website for public review. The stakeholders identified in section 9.1.1 will be allowed an opportunity to comment. Furthermore, the DFFE Biodiversity section will be consulted, and reports will be submitted for review and comments.

13.6.3 Developing a Strategy and Resolving Key Issues

A strategy for addressing and resolving key issues is to be developed and will include:

- Details on all assessments and investigations carried out;

- Use of the public participation meetings to present the findings of the reports and test the acceptability of priority issues and mitigations;
- Openly and honestly relating both positive and negative impacts of the proposed development during the public meetings; and
- Allowing the public to understand the consequences of the proposed development on the area and their livelihoods.

13.7 A DESCRIPTION OF THE TASKS THAT WILL BE UNDERTAKEN AS PART OF THE ENVIRONMENTAL IMPACT ASSESSMENT

The section below indicates the tasks undertaken as part of the EIA process. The tasks to be completed during the EIA phase include:

- Detailed specialist studies as detailed in Section 13.1
- Public and Stakeholder Consultation:
    - Notification of the availability of the EIA Report for review and comment to all registered I&APs through notices and newspaper adverts;
    - Distribution of the Draft Report to Stakeholders electronically and hardcopies;
    - Public and focus group meetings;
    - Compilation of the Comments Response Report,
- Authority consultation:
    - Consultation with the competent authorities; and
    - Other relevant/ commenting authorities' consultation is needed to provide authorities with project-related information and obtain their feedback.
- Document compilation:
    - The EIA Report and associated EMPr will be compiled in line with the requirements of Appendix 3 and 4 of the NEMA EIA Regulations (2014, as amended) detailed below.
    - The EIA Report and EMPr will be finalised and submitted to the DFFE.

13.7.1 PREPARATION OF THE DRAFT ESIR AND EMPR

The draft EIR and EMPr will be prepared per Appendices 3 and 4 of the 2014 EIA Regulations, respectively, and will include input from the specialist studies indicated in Section 9.3.2 above. Contents of the draft EIR (Appendix 3) will consist of the following:

- Details and expertise of the EAP;
- Location of the activity;
- A plan that locates the proposed activity or activities applied for, as well as associated structures and infrastructure at an appropriate scale;

- A description of the scope of the proposed activity;
- A description of the policy and legislative context within which the proposed development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;
- 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;
- A motivation for the preferred development footprint within the approved site;
- A complete description of the process followed to reach the proposed development footprint within the approved site;
- A complete 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;
- An assessment of each identified potentially significant impact and risk, including (i) and (vii) as per the Regulations;
- A summary of the findings and recommendations of specialist reports;
- Environmental Impact Statement inclusive of (i) to (iii) as per the Regulations;
- Recommendations from the specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;
- The final proposed alternatives that respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;
- Aspects that were conditional to the findings of the assessment either by the EAP or specialist, which are to be included as conditions of authorisation;
- A description of any assumption, uncertainties, and gaps in knowledge that relate to the assessment and mitigation measures proposed;
- 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;
- The period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post-construction monitoring requirements finalised;
- The undertaking under oath by the EAP in relation to (i) and (iv) as per the regulations and
- An indication of any deviation from the approved Scoping Report, including the Plan of Study including (i) and (ii) as per the Regulations.

Contents of the EMPr (Appendix 4) will include the following:

- An EMPr must comply with Section 24N of the Act and include - details of the EAP who prepared the EMPr and the expertise of that EAP to prepare an EMPr, including a curriculum vitae;
- A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;

- A map at an appropriate scale that superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;
- A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed, and mitigated as identified through the environmental impact assessment process for all phases of the development, including (i) to (v) of the 2014 EIA Regulations as amended;
- A description of proposed impact management actions, identifying how the impact management outcomes contemplated above will be achieved, and must, where applicable, include actions as indicated in (i) to (iv) of the EIA 2014 Regulations as amended.
- The method of monitoring the implementation of the impact management actions contemplated above;
- The frequency of monitoring the implementation of the impact management actions contemplated above;
- An indication of the persons who will be responsible for the implementation of the impact management actions;
- The periods within which the impact management actions contemplated above must be implemented;
- The mechanism for monitoring compliance with the impact management actions contemplated above;
- A program for reporting on compliance, considering the requirements as prescribed by the Regulations;
- An environmental awareness plan describing how-

(i) The applicant intends to inform his or her employees of any environmental risk that may result from their work and

(ii) risks must be dealt with to avoid pollution or the degradation of the environment; and

Any specific information the competent authority may require.

13.7.2 Public Participation Process

The public participation process will continue as undertaken in Section 9; a similar approach will continue in the ESIA phase.

13.7.3 Preparation of the final EIA Report and EMPr

The final EIR and EMPr will be prepared according to Appendices 3 and 4 of the 2014 EIA Regulations as amended; further, it will be forwarded to DFFE according to the rules for report submission.

13.7.4 Identify Suitable Measures To Avoid, Reverse, Mitigate, Or Manage Identified Impacts And To Determine The Extent Of The Residual Risks That Need To Be Managed And Monitored

The aspects that will be assessed have been identified, and their potential impacts and mitigation measures are indicated in Section 12 and will be elaborated further in the EMPr. The proposed method of assessing environmental aspects is included in Table 44 above.

14 UNDERTAKING UNDER OATH OR AFFIRMATION BY THE EAP

In undertaking the Scoping phase of the project, the EAP has considered the requirements stipulated in the EIA 2014 Regulation as amended and other relevant Acts and Regulations. The EAP hereby confirms that with the information available at the time of preparing the Scoping Report, the following has been considered in preparing this report:

- The correctness of the information provided in the report;
- The inclusion of comments and inputs from stakeholders and interested and affected parties; and
- Any information provided by the EAP to the interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties.

Refer to Appendix E for the Declaration of the EAP.

14.1 AN UNDERTAKING UNDER OATH OR AFFIRMATION BY THE EAP ABOUT THE LEVEL OF AGREEMENT BETWEEN THE EAP AND INTERESTED AND AFFECTED PARTIES ON THE PLAN OF STUDY FOR UNDERTAKING THE ENVIRONMENTAL IMPACT ASSESSMENT

The Plan of Study for the EIA forms part of this Report, which will be made available to I&APs and Organs of State for a 30-day review and comment period. Comments/issues raised will be addressed and included in the CRR.

No agreement between the EAP and I&APs is in place.

14.2 WHERE APPLICABLE, ANY SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

It will be updated during the Final submission.

14.3 ANY OTHER MATTER REQUIRED IN TERMS OF SECTION 24(4) (A) AND (B) OF THE ACT

Information that the NEMA requires has been included in this report and will be included in the EIA phase.

15 DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES AND KNOWLEDGE GAPS

15.1 ASSUMPTIONS AND LIMITATIONS

The technical data supplied by the client when the Draft Scoping Report was compiled is assumed to be correct and valid. Furthermore, the alternatives presented by the client are assumed to be feasible.

15.1.1 PUBLIC PARTICIPATION PROCESS

Public and focus group meetings will be held, and the meeting minutes will be submitted with the final Scoping report. However, various means will be afforded for the public to participate in the EIA process and comment on the draft reports (Scoping and EIA). Much as the process detailed in the Regulation will be followed, some interested and affected parties may be missed. This must not be considered a deliberate omission.

15.1.2 LITERATURE REVIEW

This report was based on various literature reviews and the previous specialist input, which were considered correct at the time. However, it is acknowledged that there might be some gaps in knowledge regarding the literature reviewed, although concerted efforts were made to attain as much information as possible. Further specialist studies will be undertaken to enhance the literature review.

15.2 SPECIALIST GAPS AND LIMITATIONS

All specialist reports to be completed will include gaps and limitations associated with the specific themes.

15.2.1 HERITAGE STUDY

It is possible that the Phase 1 HIA missed heritage resources in the project area, as some heritage structures may lie below the surface and may only be exposed once development commences.

15.2.2 VEGETATION ASSESSMENT

- Whilst every effort is made to cover as much of the site as possible, representative sampling was completed as per the nature of this type of investigation. Therefore, it is likely that some plant and animal species on site were not recorded during the field investigations. An in-depth Avifauna investigation is not included in this report.

- Every effort is made to identify all plant species on-site during field investigations. However, this being the wet season, any winter flowering species would have been omitted from the field data.
- This report lists the findings of an on-site baseline evaluation within the study area for the construction and operation activities of the PV facility and related activities. Where necessary, recommendations for the most appropriate mitigation measures have been included.
- To obtain a comprehensive understanding of the dynamics of the biota on a site, including SCC, studies should include investigations through the different seasons of the year over several years and extensive sampling of the area. Due to the EIA process time constraints, such long-term research was not feasible, and the information contained within this report is based on a late wet season field survey.
- It must be noted that field investigations did not include a nocturnal survey for safety reasons; therefore, nocturnal species were not recorded by this means.
- Furthermore, during the site investigation, the prevailing temperature was low, and persistent rainfall and hail could have influenced the behaviour of reptile species and meant they might not have been as active.

15.2.3 WETLAND ASSESSMENT

During the present study, the following limitations were experienced:

- To obtain definitive data regarding the biodiversity, hydrology, and functioning of particular wetlands, studies should ideally be conducted over several seasons and a number of years. The current study relied on information gained during a single field survey conducted during a single season, desktop information for the area, as well as professional judgment and experience;
- Wetland and riparian areas within transformed landscapes, such as urban and/or agricultural settings or mining areas with existing infrastructure, are often affected by disturbances that restrict the use of available wetland indicators, such as hydrophytic vegetation or soil indicators (e.g. as a result of dense stands of alien vegetation, dumping, sedimentation, infrastructure encroachment and infilling). As such, wetland and riparian delineations as provided are based on indicators where available and the author's interpretation of the current extent and nature of the wetlands and riparian areas associated with the proposed activity;
- Some precision agricultural techniques, such as topographical manipulation and soil redistribution ploughing, were evident within the study area, which in some instances could obscure pedological signs of wetness and hydric soil forms;
- Wetland and riparian assessments are based on available techniques developed through the Department of Water and Sanitation (DWS). These methods are, however, largely qualitative with associated limitations due to the range of interdisciplinary aspects that must be considered. Current and historic anthropogenic disturbance within and surrounding the study area has resulted in soil profile disturbances as well as successional changes in species composition in relation to its original /expected benchmark condition;
- Delineations of wetland areas were largely dependent on the extrapolation of field indicator data obtained during field surveys, 5m contour data for the study area, and from the interpretation of geo-referenced

orthophotos and satellite imagery as well as historical aerial imagery data sets received from the National Department of Rural Development and Land Reform. As such, inherent orthorectification errors associated with data capture and transfer to electronic format are likely to decrease the accuracy of wetland boundaries in many instances and

- Wetlands outside the study area boundary were extrapolated using aerial imagery. However, some sampling was done outside the study boundaries to confirm findings and better interpret the Hydropedological characterisation of the study area.
- No other specialist studies were available when writing this report to support findings for determining the Ecological Importance and Sensitivity of watercourses. However, all watercourses within the study and 500m from the study area were considered sensitive (except artificial wetland habitat).
- Regarding Ecological Importance and Sensitivity for pans, very little research has been conducted on the invertebrate biodiversity of endorheic and endorheic depressions within South Africa. Therefore, the EIS in this report is based on any detailed aquatic assessment of invertebrate biodiversity.
- Although most of the main watercourses were described as wetlands (e.g. valley bottom wetlands large sections of these watercourses were dominated by riparian habitat ("non-traditional riparian"; thus, riparian habitat dominated by graminoids). However, signs of wetness and hillslope driver processes were intermittently observed within these watercourses, likely due to varying geology and intrusions between the dolerites. Therefore, a conservative approach was taken, and classification was sided towards wetland classification as separating the various riparian versus wetland sections was not deemed practically or economically feasible.
- No Hydropedological studies were available to confirm wetlands drivers and Hydropedological responses associated with the terrain.
- Once the final layout, construction methodologies, and operational management regimes for landscape maintenance are established, a final impact assessment should be produced.

15.2.4 Agricultural Assessment

- It is assumed that the infrastructure components will remain as indicated on the layout and that the activities for the construction and operation of the infrastructure are limited to that typical for a project of this nature;
- The soil survey was confined to the study area outline with consideration of various land uses outside the study area;
- During the site assessment and compilation of the report, employment figures pertaining to the study area could not be sourced,
- A detailed investigation of economic aspects pertaining to the Production figures in terms of yield could not be sourced from the Natural Agricultural Resources Atlas of South Africa as the data was not available for areas utilising their land for pasture and
- Soil profiles were observed using a 1.5m hand-held soil auger; thus, a description of the soil characteristics deeper than 1.5m cannot be given.

15.2.5 AVIFAUNA

The following assumptions and limitations pertain to this report:

- Habitat boundaries usually consist of subtle transitional zones or ecotones, which cannot be captured as distinct lines. Boundaries of habitat types are, therefore, approximately defined.
- Habitat types are defined and mapped in the context of use by birds and not in terms of botanical species associations. Similarly, the riparian habitat associated with rivers, wetlands, and dams is defined in terms of broad habitat use by birds and does not denote the boundaries of wetlands and watercourses.
- The preliminary assessment was conducted over the entire ~118 ha study area to get an overview of habitats, landscape features, and sensitivities. While it's unlikely, any of the habitat delineations are subject to change if new sensitivities come to light following the more detailed seasonal assessments.

15.2.6 PALAEONTOLOGY

Based on the area's geology and the palaeontological record, the formation and layout of the dolomites, sandstones, shales, and sands are typical for the country. Only some might contain fossil plants, insects, invertebrates, and vertebrates. The sands and soils of the Quaternary period would not preserve fossils.

16 IMPACT STATEMENT

The initial phases of the assessment ensured the creation of buffers supported by input from the specialist. Given the site's sensitivity, buffers were created to inform the design, as presented in Section 4. The layout currently presented has considered the potential flaws.

The main impacts identified are outlined below and recommended mitigation measures and a summary of site suitability and residual impacts will be assessed in detail during the EIA phase. Such potential impacts include the following:

Impacts evaluated as part of the SSV and found to be of **Low significance** include:

- Wetland Impact
- Heritage Impact Assessment
- Paleontological Impact
- Civil Aviation Impact and Glint and Glare
- Impact on the Defence Theme

Impacts evaluated as part of the SSV and found to be of **medium significance** include:

- Avifauna Impact Assessment
- Agriculture
- Animal and Plant Theme

Impacts evaluated as part of the SSV and found to be of **High significance** include:

- Terrestrial Biodiversity Assessment

The specialist studies will consider the GN 1150 prescribed protocols and Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes in terms of Section 24(5) (a) and (h) and 44 of the National Environmental Management Act, 1998.

The subsequent EIA phase will provide a detailed assessment of the identified impact, rate the significance accordingly, and propose mitigation measures as applicable. Based on all the findings and assessments of impacts, the site is feasible for the proposed development and will be assessed further in the EIA phase. The No-Go option will also be comprehensively evaluated, considering specialist studies recommended as part of the PoS.

No significant impacts were identified during the scoping phase that would necessitate substantial redesign or termination of the project.

17 CONCLUSION

The Scoping Report was undertaken according to the requirements of the NEMA, the EIA Regulations as amended, and associated legislation. The Scoping phase entailed a detailed description of the baseline environment, which formed the backdrop of the impact assessment phase.

The alternatives have been proposed, and the primary purpose was to determine the feasibility of each alternative for the desired outcome and the overall impact of project development on the environment. The selection of sites was supported by specialist sensitivity verification reports and, in some instances, desktops, which provided high-level input on the environmental attributes of the sites under consideration. All technical options considered during the draft will be carried over. The SSVs also informed the level of detail required in the EIA phase as such specialists will be commissioned to inform the process and address some of the main issues raised during the consultation process; such specialist input will be sought in the EIA Phase in line with the Protocols. The subsequent EIA phase will provide a detailed assessment of the identified issues, rate the significance accordingly, and propose mitigation measures as applicable.

The Draft Report is subjected to a 30-day comment and review period, allowing input from stakeholders and I&APs. The comments on the draft will be considered and comprehensively addressed through email correspondence, calls, meetings, and inclusion in the report.

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