Appendix H.8

SOCIO-ECONOMIC ASSESSMENT

DALMANUTHA WIND (PTY)LTD

SOCIAL IMPACT ASSESSMENT FOR THE DALMANUTHA FACILITY WIND ENERGY FACILITY (ALTERNATIVE 1 AND 2), BELFAST, MPUMALANGA

DALMANUTHA WIND ENERGY

MAY 2023

INTERNAL

DALMANUTHA WIND (PTY)LTD

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SOCIAL IMPACT ASSESSMENT FOR THE DALMANUTHA FACILITY WIND ENERGY FACILITY (ALTERNATIVE 1 AND 2), BELFAST, MPUMALANGA

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TABLE OF ABBREVIATIONS

BESS	Battery Energy Storage System
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessments
ESMP	Environmental and Social Management Plan
IDP	Integrated Development Plan
IFC	International Financing Corporation
MTS	Main Transmission Station
NDM	Nkangala District Municipality
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
SIA	Social Impact Assessment
WEF	Wind energy facilities
CSIR	Council for Scientific and Industrial Research
ESIA	Environmental and Social Impact Assessment
IPP	Independent Power Producers
NEMA	National Environmental Management Act
NGO	Non-Governmental Organisation
TVET	Technical and Vocational Education and Training
REDZ	Renewable Energy Development Zones

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INTRODUCTION

1 INTRODUCTION

Dalmanutha Wind (Pty) Ltd is proposing to develop the Dalmanutha Wind Energy Facility (WEF) Project (hereafter referred to as the "Project"), near Belfast in Mpumalanga Province, South Africa. The proposed Project consists of two alternatives: Alternative 1 (a WEF consisting of up to 70 wind turbines) and Alternative 2 (a hybrid facility comprising a wind consisting of up to 44 wind turbines and a solar energy facility (SEF)). The Project forms part of the Dalmanutha Wind Energy Complex. WSP Group Africa (Pty) Ltd. (WSP) has been appointed to undertake the Environmental and Social Impact Assessment (ESIA) for the Project.

1.1 TERMS OF REFERENCE

The environmental impact assessment (EIA) for this Project is conducted subject to the National Environmental Management Act 107 of 1998 (NEMA) [EIA Regulations (2014 as amended)] and the International Financing Corporation (IFC) Guidelines. A social impact assessment (SIA) is required as part of the process. The SIA will:

- Describe the socio-economic conditions of the receiving environment.
- Identify and describe the socio-economic implications associated with the proposed Project.
- Identify, describe, and rate the significance of the socio-economic impacts that may result from the proposed Project.
- Recommend feasible (practical and cost-effective) mitigation measures to enhance positive effects and reduce negative impacts.

1.2 PROJECT DESCRIPTION

1.2.1 DALMANUTHA WIND ENERGY FACILITY (ALTERNATIVE 1)

The proposed Dalmanutha WEF will be developed with a capacity of up to 300 megawatts (MW) and will comprise the following key components:

Table 1 - Dalmanutha Wind and Solar Facility Project Description

Key Components	Description
Wind Turbines	▪ Up to 70 turbines[1], each with a foundation of approximately 25m^2 in diameter (500m^2 area and requiring ~2 500m^3 concrete each) and approximately 3m depth; ▪ Turbine hub height of up to 200m; ▪ Rotor diameter up to 200m; and ▪ Permanent hard-standing area for each wind turbine (~1ha per turbine).

[1] An up to 77 turbine layout was considered during the scoping phase however because of the avifauna specialist input the turbine layout has been optimised to include up to 70 turbines. The optimised up to 70 turbine layout will be assessed in the EIA phase.

Key Components	Description
IPP Portion On-site Substation And Battery Energy Storage System (BESS)	▪ IPP portion on-site substation of up to 4ha. The substation will have a high-voltage substation yard to allow for multiple up to 132kV feeder bays and transformers, a control building, telecommunication infrastructure, and an access road. ▪ The BESS storage capacity will be up to 300MW/1200 megawatt-hour (MWh) with up to four hours of storage. It is proposed that Lithium Battery Technologies, such as Lithium Iron Phosphate, Lithium Nickel Manganese Cobalt oxides or Vanadium Redox flow technologies, will be considered the preferred battery technology; however, the specific technology will only be determined following Engineering, Procurement, and Construction (EPC) procurement. The main components of the BESS include the batteries, power conversion system and transformer, which will all be stored in various rows of containers.

Operation and Maintenance Building Infrastructure	— Operations and maintenance (O&M) building infrastructure will be required to support the functioning of the WEF and for services required by operations and maintenance staff. The O&M building infrastructure will be near the on-site substation and will include the following:
	  — Operations building of approximately 200m^2;
	  — Workshop and stores area of approximately 150m^2 each;
	  — Stores area of approximately 150m^2; and
	  — Refuse area for temporary waste and septic/conservancy tanks with portable toilets to service ablution facilities.
	— The total combined area of the buildings will not exceed 5 000m^2.

Construction Camp Laydown	▪ Temporary laydown or staging area -Typical area 220m x 100m = 22,000m^2. ▪ The laydown area could increase to 30,000m^2 for concrete towers, should they be required. ▪ Sewage: septic and conservancy tanks and portable toilets. ▪ Temporary cement batching plant, wind tower factory and yard of approximately 7ha, comprising, amongst others, a concrete storage area, batching plant, electrical infrastructure and substation, generators and fuel stores, gantries and loading facilities, offices, material stores (rebar, concrete, aggregate and associated materials), mess rooms, workshops, laydown and storage areas, sewage and toilet facilities, offices and boardrooms, labour mess and changerooms, mixers, moulds and casting areas, water and settling tanks, pumps, silos and hoppers, a laboratory, parking areas, internal and access roads - Gravel and sand will be stored in separate heaps while the

Key Components	Description
	cement will be contained in a silo. The maximum height of the silo will be 20m.
Access Roads	▪ The Project site can be accessed easily via the tarred R33 or the N4 national road, which runs along the site's northern and western boundaries. ▪ An existing road goes through the land parcels to allow for direct access to the Project development area. ▪ Internal and access roads with a width of between 8m and 10m can be increased to approximately 12m on bends. The roads will be positioned within a 20m wide corridor to accommodate cable trenches, stormwater channels and bypass /circles of up to 20m during construction. The length of the internal roads will be approximately 60km.
Associated Infrastructure	▪ The medium voltage collector system will comprise cables up to and including 33kV that run underground, except where a technical assessment suggests that overhead lines are required within the facility connecting the turbines to the on-site substation. ▪ Over the fence 132kV cable to connect the on-site substation to the Common Collector Switching Station. ▪ Fencing of up to 4m high around the construction camp and lighting. ▪ Lightning protection. ▪ Telecommunication infrastructure. ▪ Stormwater channels. ▪ Water pipelines. ▪ Offices. ▪ Operational control centre. ▪ Operation and Maintenance Area / Warehouse/workshop. ▪ Ablution facilities. ▪ A gatehouse. ▪ Control centre, offices, warehouses. ▪ Security building. ▪ A visitor's centre. ▪ Substation building.

1.2.2 DALMANUTHA WIND AND SOLAR FACILITY (ALTERNATIVE 2)

The proposed Dalmanutha Wind and Solar Energy Facility will be developed with a capacity of up to 300 megawatts (MW) and will comprise the following key components:

Table 2 - Dalmanutha Wind and Solar Facility (Alternative 2) Project summary

Key Components	Description
Wind Turbines	▪ Up to 44 turbines, each with a foundation of approximately 25m^2 in diameter (500m^2 area and requiring ~2 500m^3 concrete each) and approximately 3m depth;

Key Components	Description
	▪ Turbine hub height of up to 200m; ▪ Rotor diameter up to 200m; and ▪ Permanent hard-standing area for each wind turbine (approximately 1ha per turbine).
Solar Fields	▪ Solar PV array comprising PV modules (solar panels), which convert the solar radiation into direct current (DC); ▪ PV panels will be up to a height of 6m (when the panel is horizontal) and will be mounted on fixed-tilt, single-axis tracking or dual-axis tracking mounting structures. Monofacial or bifacial Solar PV Modules are both considered; ▪ Footprint: ~160 ha; and ▪ Inverters, transformers, and other required associated electrical infrastructure and components
IPP portion on-site Substation and BESS	▪ IPP portion on-site substation of up to 4ha. The substation will consist of a high-voltage substation yard to allow for multiple up to 132kV feeder bays and transformers, control building, telecommunication infrastructure, access road, etc.; and ▪ The BESS storage capacity will be up to 300MW/1200 megawatt-hour (MWh) with up to four hours of storage. It is proposed that Lithium Battery Technologies, such as Lithium Iron Phosphate, Lithium Nickel Manganese Cobalt oxides or Vanadium Redox flow technologies, will be considered the preferred battery technology; however, the specific technology will only be determined following EPC procurement. The main components of the BESS include the batteries, power conversion system and transformer, which will all be stored in various rows of containers.
Operation and Maintenance Building Infrastructure	▪ O&M building infrastructure will be required to support the functioning of the WEF and SEF and for services required by operations and maintenance staff. The O&M building infrastructure will be near the on-site substation and will include the following: – Operations building of approximately 200m^2; – Workshop and stores area of approximately 150m$^{2\ each}$; – Stores area of approximately 150m^2; and – Refuse area for temporary waste and septic/conservancy tanks with portable toilets to service ablution facilities. – The total combined area of the buildings will not exceed 5 000m^2.
Construction Camp Laydown	▪ Temporary laydown or staging area -Typical area 220m x 100m = 22,000m^2. ▪ The laydown area could increase to 30,000m^2 for concrete towers, should they be required. ▪ Sewage: septic and conservancy tanks and portable toilets.

Key Components	Description
	▪ Temporary cement batching plant, wind tower factory and yard of approximately 7ha, comprising, amongst others, a concrete storage area, batching plant, electrical infrastructure and substation, generators and fuel stores, gantries and loading facilities, offices, material stores (rebar, concrete, aggregate and associated materials), mess rooms, workshops, laydown and storage areas, sewage and toilet facilities, offices and boardrooms, labour mess and changerooms, mixers, moulds and casting areas, water and settling tanks, pumps, silos and hoppers, a laboratory, parking areas, internal and access roads - Gravel and sand will be stored in separate heaps while the cement will be contained in a silo. The maximum height of the silo will be 20m.
Access Roads	▪ The Project site can be accessed easily via the tarred R33 or the N4 national road, which runs along the site's northern and western boundaries. ▪ An existing road goes through the land parcels to allow for direct access to the Project development area. ▪ Internal and access roads with a width of between 8m and 10m for the WEF can be increased to approximately 12m on bends. The roads will be positioned within a 20m wide corridor to accommodate cable trenches, stormwater channels and bypass /circles of up to 20m during construction. The length of the internal roads will be approximately 60km. For the SEF, internal gravel roads will be established between the arrays and will be up to 4m wide.
Associated Infrastructure	▪ For the WEF, the medium voltage collector system will comprise cables up to and including 33kV that run underground, except where a technical assessment suggests that overhead lines are required within the facility connecting the turbines to the on-site substation. The SEF will comprise low and medium voltage cabling between components (above or below ground as needed). ▪ Over the fence 132kV cable to connect the on-site substation to the Common Collector Switching Station. ▪ Fencing of up to 4m high around the construction camp and lighting. ▪ Lightning protection. ▪ Telecommunication infrastructure. ▪ Stormwater channels. ▪ Water pipelines. ▪ Offices. ▪ Operational control centre. ▪ Operation and Maintenance Area / Warehouse/workshop. ▪ Ablution facilities. ▪ A gatehouse. ▪ Control centre, offices, warehouses. ▪ Security building.

1.3 PROJECT LOCATION

Dalmanutha is situated in the Mpumalanga Province, South Africa, 16 km east of Belfast, on the route between Pretoria and Maputo. It falls under Emakhazeni Local Municipality, between two major towns in the province, namely Middelburg and Nelspruit. The Project is connected to both these centres via the N4 Freeway. Figure 1 shows the location of the Project site.

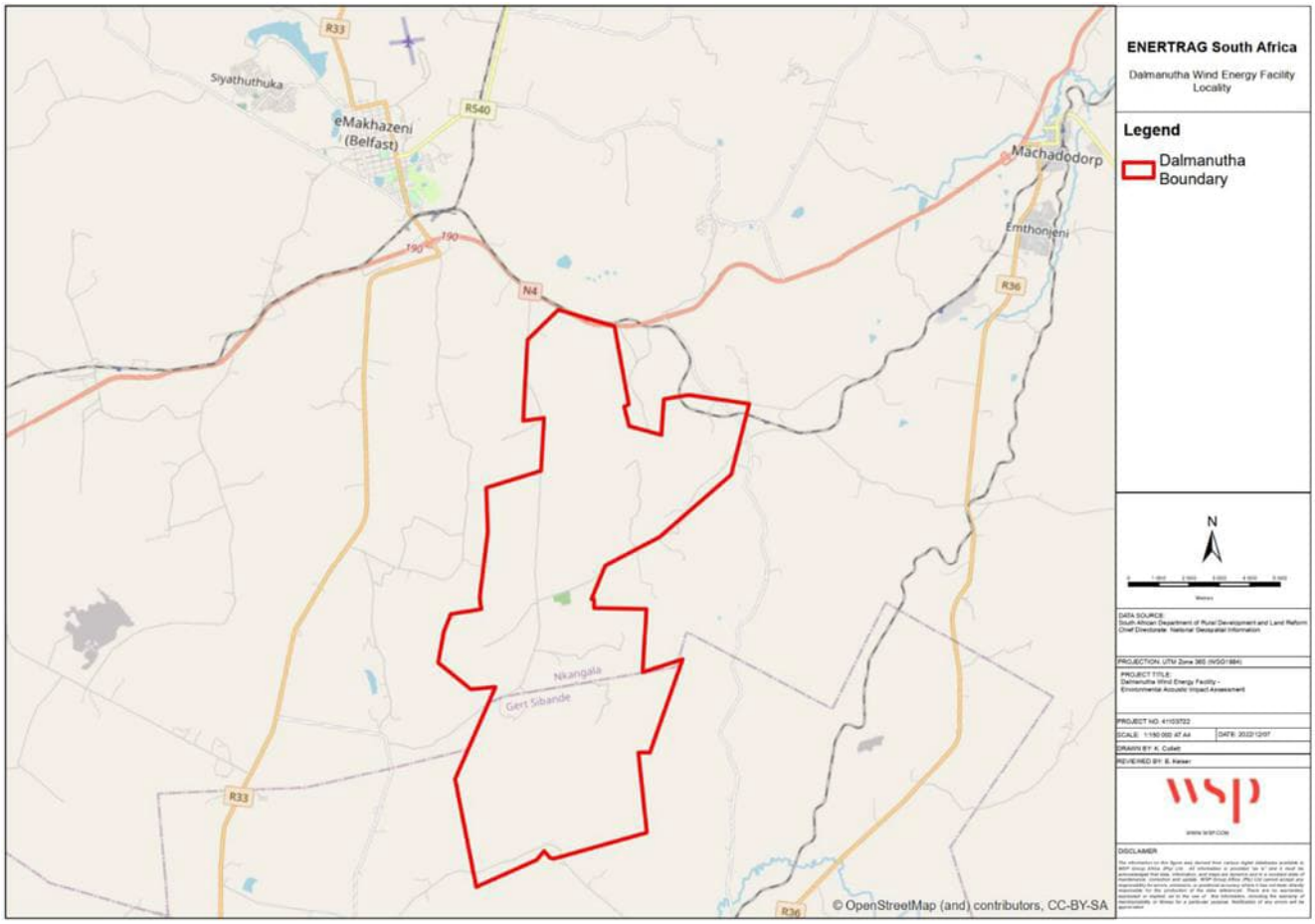

Figure 1 - Location of the Project site

2 SOCIAL IMPACT METHODOLOGY

2.1 DESKTOP REVIEW

WSP reviewed available documents to obtain information regarding the socio-economic conditions in the study area. The documents reviewed include the following:

- Integrated Development Plans (IDPs). (Emakhazeni Local Municipality, 2018-2022)
- Socio-economic and demographic statistics. (Stats SA, 2011)
- Documents concerning the proposed Project, which include a Project description document. (ENERTRAG, 2022)
- Available maps and satellite imagery
- Specialists report (Dalmanutha Acoustic Assessment)
- Dalmanutha Visual Impact Assessment
- Dalmanutha Traffic Impact Assessment
- Comments and Responses for the Dalmanutha WEF Project

3 LEGISLATIVE CONTEXT

3.1 THE CONSTITUTION OF SOUTH AFRICA

Table 3-1 - Aspects of the South African Constitution applicable to SIA

Legislation	Description
Section 24 of the Constitution	Everyone has the right a. to an environment that is not harmful to their health or well-being; and b. to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that i. prevents pollution and ecological degradation. ii. promote conservation. iii. secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.
Section 25 of the Constitution	(1) No one may be deprived of property except in terms of the law of general application, and no law may permit arbitrary deprivation of property. (2) Property may be expropriated only in terms of general application (a) for a public purpose or in the public interest; and (b) subject to compensation, the amount of which and the time and manner of payment have either been agreed by those affected or decided or approved by a court. (6) A person or community whose land tenure is legally insecure due to past racially discriminatory laws or practices is entitled to the extent provided by an act of Parliament, either to legally secure tenure or to comparable redress."

3.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (NEMA)

According to NEMA, sustainable development requires the integration of social, economic, and environmental factors in the planning, implementation, and evaluation of decisions to ensure that development serves present and future generations.

3.3 THE NATIONAL SPATIAL DEVELOPMENT PERSPECTIVE

According to the National Spatial Development Perspective, spatial development should, where appropriate, accommodate and promote private economic ventures, which can aid sustainable economic growth, relieve poverty, increase social investment, and improve service delivery. Consequently, municipal-level spatial planning has been considered where possible.

3.4 THE NATIONAL WATER ACT NO. 36 OF 1998

The National Water Act (No. 36 of 1998) (NWA) governs the protection of water resources and water use. Section 21 of the Act identifies specific land uses, infrastructure developments, water

supply or demand and waste disposal as water uses that require authorisation by the Department of Water and Sanitation (DWA). Water use is defined broadly in the NWA. Water use includes taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering the bed, banks, course or characteristics of a watercourse, removing water found underground for specific purposes, and recreation. Water use must be licensed unless listed in Schedule 1 if an existing lawful use is permissible under a general authorisation or if a responsible authority waives the need for a licence.

3.5 THE BIODIVERSITY ACT NO 10 OF 2004

The sensitive biodiversity areas within the municipal jurisdiction were identified in 2009 while developing an Environmental Management Framework for the municipality. Global warming and climate change are a reality, and the government has since taken measures to raise awareness of climate change. At Emakhazeni Local Municipality, the need to develop a climate change response strategy and have more awareness campaigns to reach as many citizens as possible has been identified.

3.6 NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 2008 (NO.59 OF 2008)

Act to reform the law regulating waste management to protect health and the environment by providing reasonable measures for preventing pollution and ecological degradation and securing ecologically sustainable development.

The municipality is investigating the possibility of waste-to-energy solutions through private service providers to lessen our carbon footprint. The Air Pollution and Waste Acts also prescribe that designated personnel be allocated these responsibilities. At this stage, the Environmental Management unit relies on one staff member to deal with environmental and waste management issues (Emakhazeni Local Municipality, 2021).

3.7 NATIONAL DEVELOPMENT PLAN

The objective of the National Development Plan relates to implementing public employment programmes, with which the municipality aligns through its Expanded Public Works Programme and the Community Works Programme implementation. The municipality also has close working relations with the social partners in ensuring that the locals are prioritised through employment when implementing capital programmes.

3.8 INTERNATIONAL GUIDELINES AND STANDARDS

This study has considered the requirements of the International Finance Corporation Performance Standards (IFC PS). The IFC PSs (and associated guidance notes) provide guidance on identifying impacts and related risks, as well as mitigating these risks, to develop a Project sustainably.

Over time, the IFC PS developed into an environmental and social risk management framework used internationally by financial institutions.

Table 3-2 - IFC performance standards

Performance Standard	PS Objective	Relevant	Note
PS1: Assessment and management of environmental and social risks and impacts	▪ To identify and evaluate social risks. and Project impacts ▪ To adopt a mitigation hierarchy. ▪ To promote improved environmental and social performance. ▪ To address grievances from affected communities. ▪ To encourage and provide ways for adequate (stakeholder) engagement.	Yes	The ESIA has been undertaken to identify and evaluate the proposed Project's environmental and social risks and impacts. An Environmental and Social Management Plan will be formulated and tailored to the Project to stipulate mitigation measures to manage adverse social impacts identified in the ESIA.
PS2: Labour and working conditions	▪ 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. ▪ 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.	Yes	The developer will create employment opportunities during the Project's construction and operations phases by appointing contractors.

Performance Standard	PS Objective	Relevant	Note
PS4: Community health, safety and security	▪ Anticipate and avoid adverse impacts on the health and safety of the affected community during the Project life from routine and non-routine circumstances. ▪ 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.	Yes	The key PS4 impacts are as follows: ▪ Lower-risk PS4 considerations include the risk of electrocution ▪ Potential electromagnetic field exposure, appropriate safety and security ▪ Measures will need to be implemented for all the Project sites - the location of the powerlines outside of the security perimeter of the Project sites may hold a potential risk of electrocution and potential electromagnetic field exposure. ▪ These risks will be qualitatively evaluated in the environmental and social assessment and the clients' standard safety and security measures, as well as potential additional measures recommended by WSP, and will be detailed in the EMPr.
PS5: Land acquisition and involuntary resettlement	▪ To avoid, and when avoidance is not possible, to minimise displacement by exploring alternative Project designs. ▪ To avoid forced eviction. ▪ To anticipate and avoid, or where avoidance is not possible, to minimise adverse social and economic impacts from the land acquisition or restrictions on land use by (i) providing compensation for loss of assets at replacement cost and (ii) ensuring that	No	Initial observation of the land use suggests that no physical or economic displacement or livelihood restoration will be required.

Performance Standard	PS Objective	Relevant	Note
	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 by providing adequate housing with security of tenure at resettlement sites. ■ To identify risks associated with resettlement transactions. ■ To recommend land-based resettlement strategies for physically and economically displaced households whose livelihoods have been land-based.		
PS7: Indigenous peoples	To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture and natural resource-based livelihoods of indigenous peoples.	No	There are no indigenous peoples as defined by the IFC PS in the Project area.
PS8: Cultural heritage	Recognises the significance of cultural heritage for present and future generations, seeks to protect irreplaceable cultural heritage, and provides guidelines for its preservation.	Yes	The Dalmanutha Heritage study indicates that: ■ No Stone Age or Iron Age archaeological sites are known from the immediate area, although several sites are known from the wider geographical area.

Performance Standard	PS Objective	Relevant	Note
			▪ Several burial sites are on record for the general area and are discussed according to their farm locations. ▪ Based on the current information obtained, it is anticipated that any heritage resources within the proposed development area will have a Local Significance and lower field rating, and all sites should be mitigatable. ▪ Graves are of high social significance (Field rating GP A) and can be expected anywhere on the landscape.

4 SOCIAL BASELINE

On 16 February 2018, the DEA gazetted the Renewable Energy Development Zones (REDZ) and strategic transmission corridors and procedures for the assessment of large-scale wind and solar photovoltaic energy development activities (GN 114) and grid infrastructure (GN 113). Subsequently, on 26 February 2021, a further three REDZ were gazetted (GN 142). The procedure allows for wind and solar PV activities within the eight REDZs and electricity grid expansion within the five power corridors to be subjected to a basic assessment (BA) and not a full SEIA process. In addition, the timeframes associated with the decision on the application are reduced from 107 days to 57 days. From the information provided regarding the location of the projects, the closest REDZ is the newly gazetted Emalahleni REDZ 9. However, the proposed projects are not within a REDZ (Figure 4-1). Furthermore, the closest strategic transmission corridor is the international corridor. However, the proposed projects are also not located within this corridor (Figure 4-1) (ENERTRAG, 2022).

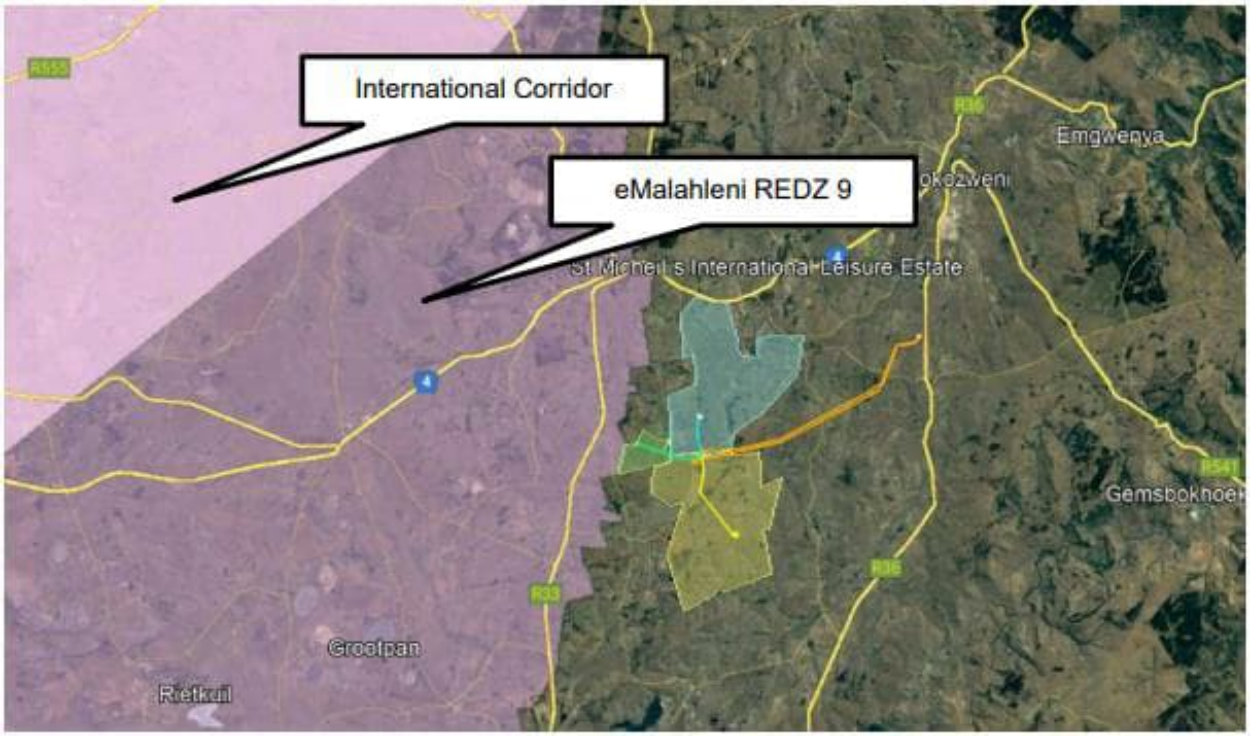

Figure 4-1 - Proposed Projects in Relation to the New Emalahleni REDZ 9 and International Corridor

The Project will significantly contribute to the countries' efforts to reduce carbon emissions and play their role in the Paris Climate Accord. The Paris Agreement is a legally binding international treaty signed by 196 countries at COP 21 in Paris on 12 December 2015 to combat climate change. The goal of the Paris Accord is to limit global warming to well below 2 degrees Celsius, compared to industrial levels, to avoid catastrophic natural disasters driven by the global temperature increase. Therefore, to achieve this long-term temperature goal, countries aim to reach the global peaking of greenhouse gas emissions as soon as possible to achieve a climate-neutral world by 2050.

Failure to do so will result in catastrophic impacts on both the global and local communities, as it is predicted that as climate change increases, this will significantly impact agriculture. Studies have shown that climate change, including the drastic increases in the frequency and intensity of extreme events, has reduced food and water security, hindering efforts to meet Sustainable Development Goals. In Mpumalanga, most farmers rely on maise, soya beans and cattle rearing as their primary sources of income. As the current climate change trends continue, this leaves them vulnerable to a possible 24% decrease in their maise yields and a significant decrease in their bean yields (Emakhazeni Local Municipality, 2021).

The Project essentially gives the farmers an alternative source of income without causing damage to their agricultural lands. Wind facilities allow for multiple land uses. The farmers can grow their crops around the turbines and let their animals graze freely without disruption. The additional gives them more financial security should the impacts of climate change continue to disrupt their harvests.

Coal-burning power station release pollution into the atmosphere, which is hazardous to human health, should they be exposed to these emissions over long periods. Wind energy provides a cleaner option as it does not emit hazardous compounds into the air.

The surrounding landscape has a rolling hill topography which is suitable for the development of a wind Project. The Project site is located on a flat, high-lying landscape with the highest wind resource within the immediate area. The Project site can be accessed easily via either the tarred R33 or the R36 national roads, which run along the northern and western boundaries of the site. An existing road goes through the land parcels to allow for direct access to the Project development area. There is minimal competition in the area concerning renewable energy facilities; thus, the Project will likely be the first wind farm in the Belfast area and will act as one of the pioneering developments and open opportunities for other renewable developments (Emakhazeni Local Municipality, 2018-2022).

4.1 MPUMALANGA PROVINCE

Mpumalanga Province is in the north-eastern part of South Africa. The province borders two of South Africa's neighbouring countries, viz. Mozambique and Swaziland; and five other South African provinces, namely, Gauteng, Limpopo, KwaZulu-Natal and Free State Provinces. Mpumalanga is characterised by the high plateau grasslands of the Middleveld, which roll eastwards for hundreds of kilometres. It rises towards mountain peaks in the northeast and terminates in an immense escarpment.

Mpumalanga Province covers an area of 76 495km² and has a population of approximately 4 335 965 [1]. The capital city of Mpumalanga is Mbombela (previously Nelspruit), and other major cities and towns include Emalahleni (formerly Witbank), Standerton, eMkhondo (previously Piet Retief), Malelane, Ermelo, Barberton and Sabie. The province is divided into three district municipalities: Gert Sibande, Ehlanzeni and Nkangala Districts. These three districts are further subdivided into 17 Local Municipalities. The proposed development falls within the Emakhazeni Local Municipality. The Emakhazeni Local Municipality falls under the Nkangala District Municipality (NDM).

4.2 NKANGALA DISTRICT MUNICIPALITY

The NDM is a Category C[2] municipality in the Mpumalanga Province. It is one of three district municipalities in the province, comprising 22% of its geographical area. The NDM comprises the Victor Khanye, Emalahleni, Steve Tshwete, Emakhazeni, Thembisile Hani, and Dr JS Moroka local municipalities (Emakhazeni Local Municipality, 2018-2022). The NDM is headquartered in Middelburg. The NDM is the economic hub of Mpumalanga and is rich in minerals and natural resources. The NDM hosts the Maputo corridor, bringing increased economic growth and tourism development potential[3].

4.3 EMAKHAZENI LOCAL MUNICIPALITY

The Emakhazeni Local Municipality is strategically located between Pretoria/Johannesburg complex in Gauteng and Nelspruit in Mpumalanga. It is bordered to the north by The Greater Groblersdal and Thaba-Chweu Local Municipalities, forming part of the Limpopo Province and Ehlanzeni District Municipality. Emakhazeni is the gateway to the major tourist attraction points in Mpumalanga and the eastern parts of Limpopo Province. The N4 and Road P81-1 provide links from Gauteng to the major tourism centres in Mpumalanga, specifically the Kruger National Park to the east and Pilgrim's Rest, Graskop, Lydenburg and Hoedspruit to the north-east (Emakhazeni Local Municipality, 2021).

4.3.1 POPULATION SIZE AND COMPOSITION

Emakhazeni Local Municipality's population increased by 0.4% (47 216 – 48 149) from 2011 to 2016. The total number of households grew from 13 722 in 2011 to 14 633 in 2016, contributing to 3.5% of the number of households in Nkangala (Table 4-1). The youth population grew by 1.6% per annum between 2011 and 2016, forming 39.6% of the total population. Table 4-1 shows population and household numbers from 2011 to 2019 and the 2030 population projection.

Table 4-1 - Population of Emakhazeni Local Municipality (Emakhazeni Local Municipality, 2018-2022)

Key Indicators	Census 2011	Community Survey 2016	Growth rate 2011-2016	Estimated 2019	Projected 2030
Population number	47 216	48 149	0.4% per annum	48 729	50 917
Household number	13 722	14 633	1.3 % per annum	15 208	17 519

[2] https://www.etu.org.za/toolbox/docs/localgov/webundrstdlocgov.html

[3] https://www.nkangaladm.gov.za/

4.3.2 Ethnic composition

Table 4-2 and Table 4-3 indicate a slight increase in the Black African population with a noticeable decrease in the Coloureds, White and Indian population. In 2011, 87.2% of the population was Black, 10.8% White, 1.2% Coloureds, Indian and Asian 0.7%, and other was 0.2%. (Emakhazeni Local Municipality, 2018-2022) The percentages changed in 2016 to 89.4% Black Africans, 0.6% Coloureds, 0.3% Indian/ Asian and 9.7% Whites.

Table 4-2 - Percentage Distribution of Emakhazeni Municipality by Population Group -2011 (Emakhazeni Local Municipality, 2018-2022)

Group	Total	%
Black African	41 168	87.2%
Coloureds	563	1.2%
Indian or Asian	330	0.7%
White	5076	10.8%
Other	79	0.2%

Table 4-3 - Percentage Distribution of Emakhazeni Municipality by Population Group- 2016

Group	Total	%
Black African	43 025	89.4%
Coloureds	322	0.6%
Indian or Asian	156	0.3%
White	4646	9.7%
Total	48 149	100%

4.3.3 EDUCATION

Figure 4-2 indicates the number of people without education has decreased from 2004 (21%) to 2014 (12%). There is a decrease in people having their highest qualification from grade three to grade 11. More people have matric. The number of people with matric increased from 20% to 40%. Recently, about 8% have matric and certificate diplomas, and less than 5% have a bachelor's degree. Figure 4-2 indicates that few people have post-matric qualifications within the municipality (about 3%). The implication is that the local community members will not be able to take advantage of job opportunities created by the economic sectors. This aspect negatively impacts the payment of municipal rates and socio-economic conditions in the area. The municipality should then speed up the process of the establishment of a TVET (Technical and Vocational Education and Training) Campus. This campus will significantly assist as it will focus on the technical skills needed for the main economic activities related to mining and trade (Emakhazeni Local Municipality, 2021).

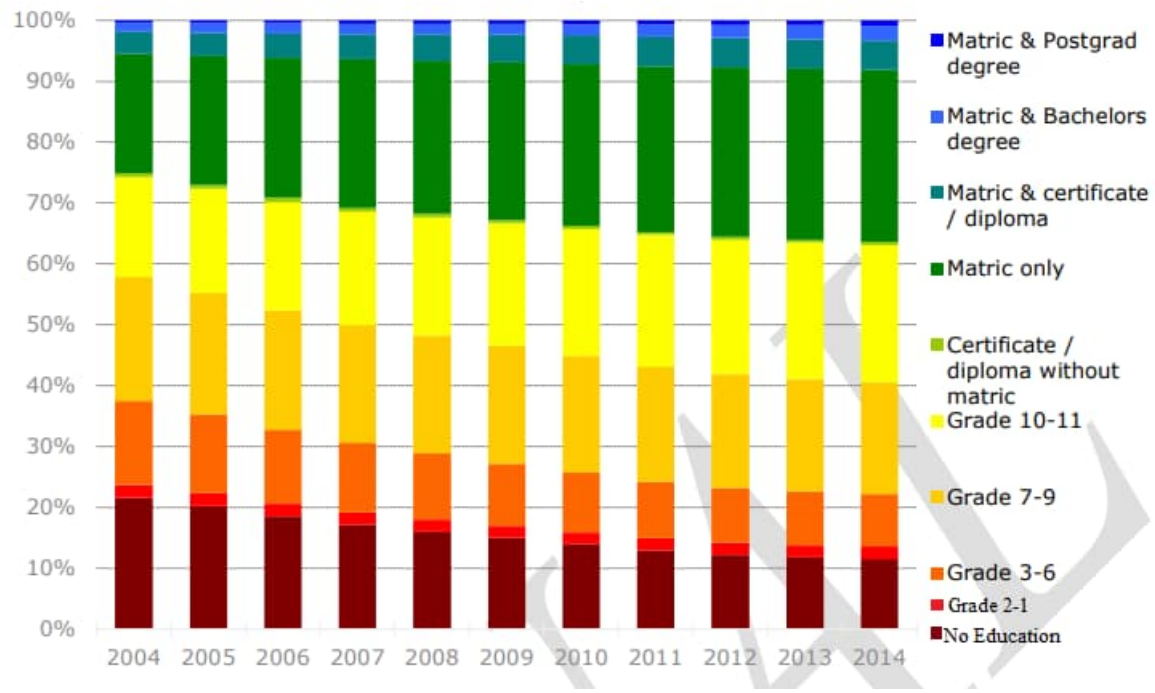

Figure 4-2 - Educational attainment for Emakhazeni Local Municipality from 2004 to 2014 (Emakhazeni Local Municipality, 2021)

4.3.4 EMPLOYMENT

The unemployment rate of Emakhazeni decreased from 25.92% in 2011 to 23.8% in 2015 (Emakhazeni Local Municipality, 2021). In 2015, the unemployment rate was the 7th lowest among all the municipal areas of Mpumalanga. In 2015, the unemployment rate for females was 29.2% and 19.9% for males (Emakhazeni Local Municipality, 2021). The municipality recorded an unemployment rate of 26.9% in 2017, with the majority of its employed in the mining and transport sectors (ENERTRAG, 2022)

4.3.5 HOUSING

According to the IDP for Emakhazeni Local Municipality (Emakhazeni Local Municipality, 2018-2022), there is a need to prioritise the finalisation of township establishment so people can formally and adequately settle. Approximately 70% live in formal dwellings or brick/concrete houses. Traditional dwellings cover 10% of the population. These may be households in rural areas. However, there are still 4% living in an informal settlement and 6% in informal dwellings/shacks in the backyard. (Emakhazeni Local Municipality, 2018-2022).

5 ASSESSMENT METHODOLOGY

GNR 982 requires the identification of the significance of potential impacts during scoping. To this end, the scoping phase has used an impact screening tool. The screening tool is based on two criteria: probability; and consequence, where the latter is based on a general consideration of the intensity, extent, and duration.

Table 5-1 - Significance Screening Tool

Probability Scale		1	2	3	4
	1	Very Low	Very Low	Low	Medium
	2	Very Low	Low	Medium	Medium
	3	Low	Medium	Medium	High
	4	Medium	Medium	High	High

Table 5-2 - Probability Scores and Descriptors

Score	Descriptor
4	**Definite**: The impact will occur regardless of any prevention measures
3	**Highly Probable**: It is most likely that the impact will occur
2	**Probable**: There is a good possibility that the impact will occur
1	**Improbable:** The possibility of the impact occurring is Very Low

Table 5-3 - Consequence Score Description

Score	Negative	Positive
4	Very severe: An irreversible and permanent change to the affected system(s) or party(ies) which cannot be mitigated.	Very beneficial: A permanent and very substantial benefit to the affected system(s) or party(ies), with no real alternative to achieving this benefit.
3	Severe: Long-term impacts on the affected system(s) or party(ies) could be mitigated. However, this mitigation would be difficult, expensive, time-consuming, or a combination.	Beneficial: A long-term impact and substantial benefit to the affected system(s) or party(ies). Alternative ways of achieving this benefit would be difficult, expensive, time-consuming, or a combination.
2	Moderately severe: A medium to long-term impact on the affected system(s) or party (ies) that could be mitigated.	Moderately beneficial: A medium to long-term impact of real benefit to the affected system(s) or party(ies). Other ways of optimising the

Score	Negative	Positive
		beneficial effects are equally difficult, expensive and time-consuming (or some combination of these) as achieving them in this way.
1	Negligible: A short to medium-term impact on the affected system(s) or party(ies). Mitigation is straightforward, cheap, less time-consuming or not necessary.	Negligible: A short to medium-term impact and negligible benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are more accessible, cheaper and quicker, or some combination of these.
Significance (S) is determined by combining the criteria in the following formula:	$[S = (E + D + R + M) \times P]$ $Significance = (Extent + Duration + Reversibility + Magnitude) \times Probability$	

IMPACT SIGNIFICANCE RATING

Total Score	4 to 15	16 to 30	31 to 60	61 to 80	81 to 100
Environmental Significance Rating (Negative (-))	**Very Low**	**Low**	**Moderate**	**High**	**Very High**
Environmental Significance Rating (Positive (+))	**Very Low**	**Low**	**Moderate**	**High**	**Very High**

The nature of the impact must be characterised as to whether the impact is deemed to be positive (+ve) (i.e. beneficial) or negative (-ve) (i.e. harmful) to the receiving environment/receptor. For ease of reference, a colour reference system. The key objectives of the risk assessment methodology are to identify any potential social issues and associated social impacts likely to arise from the proposed Project and propose a significance ranking. Issues/aspects will be reviewed and ranked against a series of significance criteria to identify and record interactions between activities, aspects, resources, and receptors to provide a detailed discussion of impacts. The assessment considers direct[4], indirect[5], secondary[6] as well as cumulative[7] impacts.

[4] Impacts that arise directly from activities that form an integral part of the Project.

[5] Impacts that arise indirectly from activities not explicitly forming part of the Project.

[6] Secondary or induced impacts caused by a change in the Project environment.

[7] Impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.

6 SOCIAL IMPACT ASSESSMENT

The SIA groups impacts associated with the Dalmanutha WEF into three phases. These phases are the construction phase, operational phase and closure phase. Appropriate mitigation measures are recommended to reduce the negative impacts and enhance positive ones. Where relevant, reference is made to applicable specialist studies.

The impacts presented in the SIA for the Dalmanutha WEF Project are similar for alternative 1 and alternative 2, except for the noise impact. Noise will be assessed separately for the two alternatives.

6.1 CONSTRUCTION PHASE

6.1.1 INCREASE IN ECONOMIC BENEFITS

Background

During the construction phase, various goods and services will be required. This requirement is likely to generate economic opportunities for local businesses. It is anticipated that the construction workforce will be housed in local accommodations (private homes, guest houses or rental options); this will also contribute to the growth of the local economy. Provided that a significant proportion of money derived from wages earned would likely be spent in the vicinity of the Project area, it is expected to create substantial flows of revenue within surrounding communities, thus acting as a catalyst for growth in the formal and second economy.

Enhancement

- Communities within the vicinity of the Project should be given special consideration regarding the benefits arising from the Project because they will be the most affected.
- The developer/EPC shall first give preference to appropriate subcontractors located in the surrounding communities, followed by those located in the municipal area and those located elsewhere or outside the province.
- Resources required during construction should be sourced, preferably from local businesses. Accommodation needed for contractors should favour local guesthouses and hostels. The developer should support development initiatives for communities in the Project area.

Significance

Being a positive impact, the significance of the impact improved from very low before enhancement to moderate after enhancement.

6.1.2 EMPLOYMENT (PREFERENTIAL PROCUREMENT)

Background

During the construction phase, high and lower-skilled employees will be required. Procurement should largely favour and benefit the local community. The municipality recorded an unemployment rate of 26.9% in 2017. The introduction of this Project can increase the employment rate and further allow skill development for the local community.

Enhancement

Recruitment policies must ensure preference for local residents. Furthermore, a monitoring system should be implemented to assess local employment levels. A local skills database should be developed and updated regularly to maximise the uptake of local labour.

Significance

As a positive impact, the impact's significance increased from Very Low before enhancement to Moderate after enhancement.

6.1.3 INTRUSION IMPACTS

6.1.3.1 Noise

Background

During the facility's construction phase, various noise sources will be present on site, including earth-moving equipment (trucks, cranes, scrapers and loaders), compressors and generators, pumps, rotary drills, and concrete mixers and materials handling activities, among others.

Mitigation

Various mitigation techniques can be employed to minimise the acoustic impacts of the Project's construction phase. These options include both management and technical options:

Planning construction activities in consultation with landowners so that activities with the greatest potential to generate noise are scheduled during periods of the day that will result in the least disturbance. Information regarding construction activities should be provided to identified and nearby receptors likely to be affected. Such information includes:

- Proposed working times.
- Anticipated duration of activities.
- Explanations of activities to take place and reasons for activities.
- Contact details of a responsible person on site should complaints arise (WSP, 2023).

Significance

As a negative impact, the impact's significance decreased from Low before mitigation to Very Low after mitigation.

6.1.3.2 Dust

Background

During the construction period, there will be an increase in heavy vehicles utilising the roads to the construction sites that may cause, at the very least, a visual nuisance to other road users and landowners in the area nearby (within 5km). Within the region, dust due to construction activities may also be visible, as there may be health implications for the nearby farms. Sensitive receptors in this zone consist of observers travelling along the R398, various secondary and internal farm roads, and local residents.

Significance

As a negative impact, the impact's significance decreased from moderate before mitigation to Low after mitigation.

Mitigation

- Reduce and control construction dust using approved dust suppression techniques as and when required.
- To suppress dust, spraying unpaved haul roads with environmentally friendly products

6.1.3.3 Lighting impacts

Background

The area surrounding the proposed facility has a relatively low incidence of receptors and light sources, so light trespass and glare from the security and after-hours during construction will significantly impact receptors. Lighting from the construction camp will also contribute to the cumulative light impact.

Significance

As a negative impact, the impact's significance decreases from moderate before mitigation to low after mitigation.

Mitigation

- Shield the light sources with physical barriers (walls, vegetation, or the structure itself).
- Limit mounting heights of lighting fixtures, or use footlights or bollard level lights.
- Make use of minimum lumen or wattage in fixtures.
- Make use of down-lighters or shielded fixtures.
- Make use of low-pressure sodium lighting or other types of low-impact lighting.
- Make use of motion detectors on security lighting. Such sensors will allow the site to remain in relative darkness until illumination is required for security or maintenance purposes.

6.1.4 TRAFFIC

Background

According to the traffic impact study, the unskilled and semi-skilled workers (90%) are expected to utilise public transport to the site from neighbouring towns, most notably Belfast, located approximately 15km northwest. It is assumed that the public transport vehicles will not remain on site during the workday. Therefore all these vehicles will arrive and depart during the AM and PM peaks. For people in the community that used to commute to work and school, there might be a change to their everyday routines (WSP, 2023).

Significance

The overall significance of each impact during the Construction Phase of the Alternative 1 WEF and Alternative 2 WEF, and SEF is Moderate and Low without mitigation and Very Low with mitigation. The impacts are only limited to the peak construction period and are fully reversible (WSP, 2023).

Mitigation

All vehicles that travel on-site must be roadworthy to ensure noise and emissions levels comply with national vehicle standards, thereby minimising noise and exhaust pollution.

In addition, additional warning signs should be provided:

- Install a temporary truck crossing warning sign (TW345) and junction warning sign (W108) on the western approach of the N4.
- Install a temporary truck crossing warning sign (TW344) and junction warning sign (W107) on the eastern approach of the N4.
- Install a temporary truck crossing warning sign (TW345) and junction warning sign (W108) on the western approach of the N4.
- Install a temporary truck crossing warning sign (TW344) and junction warning sign (W107) on the eastern approach of the N4.
- Install a temporary truck crossing warning sign (TW345) and a priority cross-road warning sign (W102) on the western approach of the N4.
- Install a temporary truck crossing warning sign (TW344) and a priority cross-road warning sign (W102) on the eastern approach of the N4.

6.1.5 POPULATION INFLUX

Background

During construction, social ills may also increase in the area because of an influx of outsiders seeking employment. The government's resources and essential services will not be sufficient for the new people. Due to overcrowding, crime is likely to increase.

Mitigation

- Local employment should be a priorityTraining programmes must be implemented to recognise prior learning and enable local participants for employment.
- Increase security in the Project area to regulate safety and population influx.

Significance

As a negative impact, the impact's significance decreases from Low before mitigation to Very Low after mitigation.

6.1.6 HEALTH AND SAFETY

Background

The Safety, Health and Environment (SHE) study (Chemical Process Safety Engineers, 2023) highlights the risk to employees and investors. This would be caused by potential hi-jacking of valuable but hazardous load, on-site theft of construction equipment and battery installation facilities, civil unrest or violent strike by employees. The impact rating is from moderate to low with mitigation.

Mitigation

- Fencing around electrical infrastructure to SANS standard and Eskom Guidelines.
- The hazardous nature of the electrical and battery equipment should be clearly indicated – e.g., Skull and Cross Bones or other signs.
- Night lighting should be provided both indoors and outdoors where necessary.

Significance

As a negative impact, the impact's significance decreased from moderate before mitigation to Low after mitigation.

6.1.7 CONSTRUCTION PHASE: IMPACT SUMMARY

Table 6-1 summarises the respective significance ratings of the construction-related impacts.

Table 6-1 – Impact Rating Pre- and Post-mitigation/enhancement, Construction Phase

Aspect	Character	Pre-Mitigation/Enhancement							Post-Mitigation/Enhancement						
		(M+	E+	R+	D)x	P=	S	Rating	(M+	E+	R+	D)x	P=	S	Rating
Increase in economic benefits	positive	1	2	1	3	2	14	P1	4	4	3	4	3	45	P3
Significance		P1 - Very Low							P3 - Moderate						
Employment	positive	2	3	2	3	2	20	P2	4	3	3	4	4	56	P3
Significance		P2 - Low							P3 - Moderate						
Noise	Negative	2	2	2	2	2	16	N2	1	2	2	1	2	12	N1
Significance		N2 - Low							N1 - Very Low						
Dust	Negative	2	3	3	1	4	36	N3	2	3	2	3	2	20	N2
Significance		N3 - Moderate							N2 - Low						
Light	Negative	2	3	3	1	4	36	N3	2	3	2	3	2	20	N2
Significance		N3 - Moderate							N2 - Low						
Traffic	Negative	2	3	1	1	4	35	N3	2	3	2	3	2	20	N2
Significance		N3 - Moderate							N2 - Low						
Population influx	Negative	3	2	1	3	2	18	N2	2	2	1	2	2	14	N1
Significance		N2 - Low							N1 - Very Low						
Health and Safety Risk	Negative	2	3	1	1	4	35	N3	3	2	1	3	2	18	N2
Significance		N3 - Moderate							N2 - Low						

6.2 OPERATION PHASE

6.2.1 POWER GENERATION

Background

Electrical power is an essential part of many modern-day economies. The South African economy is influenced by mining, and such operations require electricity to maintain mining operations. Manufacturing processes depend on electrical machines to perform repetitive tasks, which increases the productivity of the present-day industry. ("How Eskom and The Government Can Put an End To Loadshedding in South...") Electricity powers the traffic lights and moderates the temperature around us. It is also the foundation of the digital economy and the primary energy source that people use daily for various tasks (Goldberg, 2015).

South Africa has struggled to supply enough power to all residents since 2007. Power generation is a great need in South Africa, and its absence negatively impacts many. Therefore the country needs to integrate renewable power sources and less compromising on the environment.

The average annual wind speed in Dalmanutha is sufficient to ensure the economic viability of a WEF (ENERTRAG, 2022). In this specific site, many conditions, such as the location of Eskom power stations, grid connection and capacity, topography, site access, and land availability, are beneficial for the proposed Project.

Significance

As a positive impact, the impact's significance increased from Low before enhancement to moderate after enhancement.

6.2.2 EMPLOYMENT

Background

The operational phase of the Project and the connection of the powerline to the Gumeni MTS requires expertise and labour to deliver the final product. The maintenance of the facility and its functioning over the years will create employment, which will contribute positively to the economy in nearby communities. Unemployment in South Africa is negatively impacting communities, especially in the Emakhazeni Local Municipality (as demonstrated in 4.3). The Emakhazeni Local Municipality recorded an unemployment rate of 26.9% in 2017. Most of the employed people are in the mining and transport sectors. The Project will aid in solving two of the leading challenges faced by most municipalities in the country, namely the need for electricity and the lack of adequate employment opportunities.

The renewable industry presents various career opportunities. Four main pillars are aligned with the value chain and opportunities for employment within the Project. Figure 6-1 shows the four areas of employment opportunities in the Project.

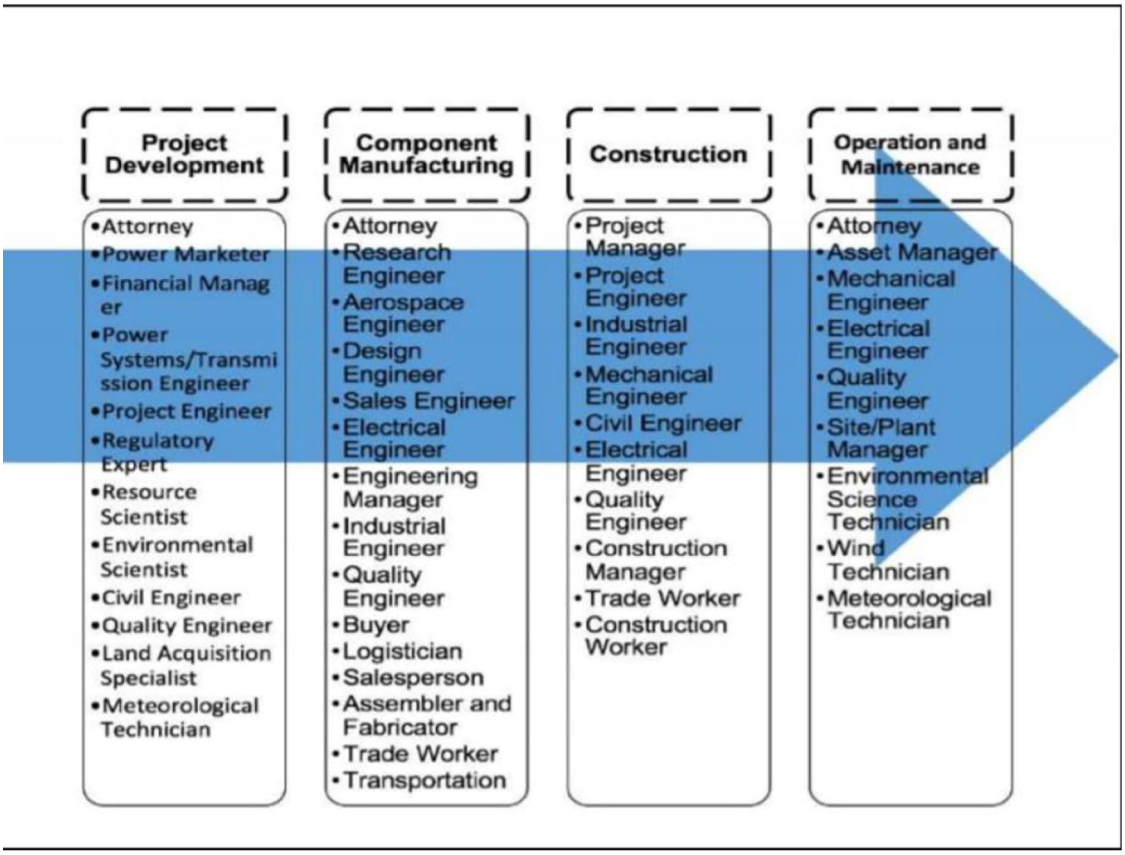

Figure 6-1 – Career Opportunities Presented by the Renewable Industry

Enhancement

- During the operation phase, locally employed individuals should receive training and be put under skill development programmes.
- Employees should be allowed the opportunity to participate in mentorship programmes.

Significance

As a positive impact, the significance increases from Very Low before enhancement to Moderate after enhancement.

6.2.3 ECONOMIC DEVELOPMENT

Background

During the Operational phase, the employee's wage bill will result in a substantial injection of cash into the economies of the local and regional areas. This aspect will stimulate development in formal and informal retail and downstream secondary industries. Furthermore, the contribution of renewable energy resources contributes to electricity production.

Enhancement

Communities within the vicinity of the Project should be given special consideration regarding the benefits arising from the Project because they will be the most affected.

The developer/EPC shall first give preference to appropriate subcontractors located in the surrounding communities, followed by those located in the municipal area and those located elsewhere or outside the province.

The developer should support development initiatives for communities near the Project.

Significance

As a positive impact, the significance increases from Very Low before enhancement to Moderate after enhancement.

6.2.4 INTRUSION IMPACTS

6.2.4.1 Noise

Background

For the operational phase (Alternative 1), impacts are anticipated to be "low" as it is understood that the direct surrounding receptors are all vested in the Project. For the operational phase (Alternative 2), impacts are anticipated to be "moderate", especially near the farmhouses situated on the property. Depending on age and different medical conditions, people that stay in farmhouses 2km from the site (as identified by the acoustic assessment) may find it challenging to deal with the noise.

Mitigation

Should the nearby turbines be relocated slightly, impacts are anticipated to become "low". Ultimately, should no complaints from receptors arise, it is recommended that the Project (Alternative 1) be considered for authorisation.

Significance

Alternative 1: As a negative impact, the impact's significance decreased from Low before mitigation to Very Low after mitigation.

Alternative 2: As a negative impact, the impact's significance decreased from moderate before mitigation to Low after mitigation.

6.2.4.2 Visual

Background

The operational phase of the proposed Project and its associated infrastructure will have a high visual impact on the study area, especially within (but not restricted to) a 5-10km radius of the proposed facility. The visual impact will differ amongst places, depending on the distance from the facility. Tourists travelling through the region and residents of homesteads will likely experience visual impacts where the wind turbine structures are visible. The index indicates that potentially sensitive visual receptors within a 5km radius of the WEF may experience a very high visual impact. The magnitude of visual impact on sensitive visual receptors subsequently subsides with distance; high within a 5 – 10 km radius (where sensitive receptors are present) and moderate within a 10 – 20 km radius (where sensitive receptors are present). Receptors beyond 20km are expected to have

a low potential visual impact. The wind turbine (WTG11) is 800m from Manyoni Primary (alternative 1). Activities within the school will be impacted during the construction phase. Leeuwkloof estate will be a receptor of the turbine, and residents of the estate will be direct receptors (1.3km away from WTG28).

Several homesteads are located within the 1.2km buffer of all the turbines (WTG1-4). Of note is that most of the homesteads are located on properties that stand to benefit from the development, thereby offsetting the impact. However, one homestead situated within 140 m from WTG 1 is not located on a property earmarked for the Project. This homestead may need to be compensated or the impact mitigated by relocating or removing the turbine.

Mitigation

- During operation, the maintenance of the turbines, ancillary structures, and infrastructure must be undertaken to ensure that the facility does not degrade, aggravating the visual impact.
- For the observer, 5-20 km, no mitigation of this impact is possible (i.e. the structures will be visible regardless), but general mitigation and management measures are recommended as best practice.
- Maintain the general appearance of the facility as a whole.
- It is recommended that vegetation cover (i.e., natural or cultivated) be maintained in all areas outside the actual development footprint (but still within the Project site) during the construction and operation of the proposed WEF. This aspect will minimise the visual impact due to cleared areas and areas denuded of vegetation.
- Existing roads should be utilised wherever possible. New roads should be planned, taking due cognisance of the topography to limit cut and fill requirements. Construction/upgrade of roads should be undertaken properly, with adequate drainage structures to forego potential erosion problems.
- Regarding on-site ancillary buildings and structures, it is recommended that it be planned so that vegetation clearing is minimised. This implies consolidating this infrastructure as much as possible and using already disturbed areas rather than undisturbed sites wherever possible.

Significance

As a negative impact, the impact's significance decreased from high before mitigation to moderate after mitigation.

6.2.5 TRAFFIC

Background

The operational phase of the Project will require a low number of permanent staff. The vehicle trips generated by the personnel accessing the site for maintenance and other purposes will therefore be low, and the associated transport impact on the surrounding road network will be negligible (WSP, 2023).

Mitigation

- All vehicles that travel on the R33 and N4 must not be overloaded, and abnormal vehicles must comply with relevant legislation for overweight loads to ensure the lowest possible road surface damage.

- All vehicles that travel on-site must be roadworthy to ensure compliance with national vehicle standards.
- All site vehicles should be marked and regularly maintained to avoid accidents and poor road functioning.

Significance

Traffic has a negative impact. The impact significance is Low before mitigation to Very Low after mitigation.

6.2.6 HEALTH AND SAFETY

Background

Risk Assessment (Chemical Process Safety Engineers, 2023) has found that with suitable preventative and mitigative measures will be put in place, none of the identified potential risks are excessively high, i.e., from a SHE perspective, no fatal flaws were found with either type of technology for the proposed BESS installation at the Dalmanutha Wind or Hybrid Wind and Solar Energy Facility. The is a risk associated with exposure to noise/irritation due to moving parts inside containers, buildings, pumps, compressors, cooling systems etc.

Mitigation

- There are numerous different battery technologies, but using one consistent battery technology system for the BESS installations associated with all the developments in the Dalmanutha area related to the Dalmanutha Project would allow for ease of training, maintenance, and emergency response and could significantly reduce risks.
- The overall design should be subject to a full Hazop before the finalisation of the design.
- An updated risk assessment should be in place.
- The design of the turbines should ensure continuous noise does not exceed 85dB within the facilities or at any other location on site or 61 dB at the site boundary, e.g., emergency generator, air compressor and so forth.
- Employees must be provided hearing protection if working near equipment exceeding the noise limits.

Significance

The Project may have adverse health and safety impacts. The impact significance is moderate before mitigation and low after mitigation.

6.2.7 OPERATIONAL PHASE: IMPACT SUMMARY

Table 6-2 summarises the respective significance ratings of the operations-related impacts.

Table 6-2 - Impact Rating Pre- and Post-mitigation/enhancement, Operation Phase

Receptor	Character	Pre-Mitigation/Enhancement							Post-Mitigation/Enhancement						
		(M+	E+	R+	D)x	P=	S		(M+	E+	R+	D)x	P=	S	
Power generation	positive	1	2	3	4	2	**20**	**P2**	4	3	3	4	4	**56**	**P3**
Significance		**P2 - Low**							**P3 - Moderate**						

Employment	positive	1	2	1	2	2	**12**	**P1**	3	3	3	3	4	**48**	**P3**
Significance		**P1 - Very Low**							**P3 - Moderate**						
Economic development	positive	2	3	3	2	3	**30**	**P2**	4	3	4	4	4	**60**	**P3**
Significance		**P2 - Low**							**P3 - Moderate**						
Battery Energy and Storage system	positive	3	4	3	5	2	**30**	**P2**	4	4	4	4	4	**64**	**P4**
Significance		**P2 - Low**							**P4 - High**						
Noise (Alternative 1)	negative	1	2	3	4	2	**20**	**N2**	1	2	1	2	2	**12**	**N1**
Significance		**N2 - Low**							**N1 - Very Low**						
Noise (Alternative 2)	negative	4	3	3	4	4	**56**	**N3**	4	3	3	4	4	**56**	**N3**
Significance		**N3 - Moderate**							**N3 - Moderate**						
Visual	negative	4	4	4	4	4	**64**	**N4**	3	3	3	2	3	**33**	**N3**
Significance		**N4 - High**							**N3 - Moderate**						
Traffic	negative	1	2	3	4	2	**20**	**N2**	2	1	1	1	1	**5**	**N1**
Significance		**N2 - Low**							**N1 - Very Low**						
Health and safety	negative	4	3	3	4	4	**56**	**N3**	3	4	3	5	2	**30**	**N2**
Significance		**N3 - Moderate**							**N2 - Low**						

6.3 DECOMMISSIONING PHASE

6.3.1 LOSS OF EMPLOYMENT

Background

During the decommissioning phase, the operational phase workforce will lose their jobs. Unfortunately, this may contribute to various adverse social consequences in the municipality and labour-sending area, such as:

- Increase or return the unemployment rate to previous levels within the Project area.
- Financial hardship and poverty.
- Family tensions and breakdown.
- Alienation, shame, stigma, and
- Crime.

Mitigation

- The developer should have timely retrenchment consultations with employees who are dependent on the Project.
- Employees could be assisted with seeking employment at other projects dealing with solar and wind.

- Training and educating employees to equip them with skills that could benefit them in other industries should be considered.

Significance

As a negative impact, the impact's significance decreased from moderate before mitigation to Low after mitigation.

6.3.2 REDUCED REGIONAL ECONOMIC IMPACT

Background

There will be reduced local spending by the developer and employees at the facility, including royalty and tax payments. Consequently, local businesses and the area may be affected negatively financially.

Mitigation

Engage local and regional government concerning the decommissioning phase.

Significance

As a negative impact, the impact's significance decreased from moderate before mitigation to Low after mitigation.

6.3.3 ASSOCIATED INFRASTRUCTURE

Background

Structures used during construction and operation will be abandoned and might attract criminals. Maintenance of these structures might decrease after the Project operation, leading to hazards to the health and welfare of the community. The batteries/equipment may have reached the end of life and may leak.

Mitigation

- End of Life shutdown procedure includes a risk assessment of the activities involved.
- Where possible, re-purpose the solid-state batteries/containers and equipment with the associated environmental impact considered.
- Disposal according to local regulations and other directives such as the European Batteries Directive.
- End of life, which is affected by temperature and time, cycles etc, should be predefined, and monitoring should be in place to determine if it has been reached.

Significance

As a negative impact, the impact's significance decreased from moderate before mitigation to Low after mitigation.

6.3.4 DECOMMISSIONING: PHASE: IMPACT SUMMARY

Table 6-3 summarises the respective significance ratings of the decommissioning-related impacts.

Table 6-3 - Impact Rating Pre- and Post-mitigation, Decommissioning Phase

Receptor	Character	Pre-Mitigation							Post-Mitigation						
		(M+	E+	R+	D)x	P=	S		(M+	E+	R+	D)x	P=	S	

Loss of employment	negative	4	4	3	4	3	**45**	**N3**	2	1	2	4	3	**27**	**N2**
Significance		**N3 - Moderate**							**N2 - Low**						
Reduced regional economic development	negative	3	4	3	3	3	**39**	**N3**	2	1	2	4	3	**27**	**N2**
Significance		**N3 - Moderate**							**N2 - Low**						
Associated infrastructure	negative	3	3	3	3	4	**48**	**N3**	2	2	1	3	2	**16**	**N2**
Significance		**N3 - Moderate**							**N2 - Low**						

7 CUMULATIVE IMPACTS

The Project impacts have been indicated in this report. However, within a 40km radius of Dalmanutha, other approved projects will further impact communities. These projects are:

- The construction of the 14MW Machadodorp PV 1 Solar Energy Facility on Portion 8 of the farm De Kroon 363 in Mpumalanga Province – 11km NE of the Site
- The proposed establishment of the Haverfontein WEF near Carolina, Mpumalanga Province – 9km S of the Site
- Eskom Arnot PV Facility at the Arnot Power Station on Remainder of Portion 24 of Rietkuil 491 JS near Middleburg in Mpumalanga – 31km SW of the site

The impacts of the projects mentioned above are likely similar to the ones discussed in this study for the Dalmanutha Wind or Dalmanutha Wind and Solar Facility. It should be noted that the landowners whose land the Project is on fully agree with the development. The developer has full consent to use the land for this Project.

Collectively these projects will have the following impacts:

- Change in the sense of place from a rural setting to one of light industry. Intrusion impacts such as noise, visual change and traffic may increase.
- Enhanced electricity generation for the national grid.
- Increased economic development during the construction of the facilities and the operation of the facilities.
- Positive economic inputs into the local economy.
- Increased local employment.

8 CONCLUSION

The SIA takes into consideration how all impacts involve the communities. Findings show that the Project will positively impact the bulk of the community, including power generation, employment and economic benefits. The negative impacts include visual (depending on how one is from the Project site, some farmers and communities will be impacted more), intrusion impacts (mostly noise) and traffic. After mitigation, most of the negative impacts have a low significance.

Table 8-1 summarises the likely social impact ratings.

Table 8-1 - Summary of impact ratings

Impact	Pre-mitigation	Post-Mitigation
Construction Phase		
Increase in economic benefits	P1 - Very Low	P3 - Moderate
Preferential procurement	P2 - Low	P3 - Moderate
Noise	N2 - Low	N1 - Very Low
Visual	N4 - High	N2 - Low
Traffic	N3 - Moderate	N1 - Very Low
Population influx	N2 - Low	N1 - Very Low
Operation Phase		
Power generation	P2 - Low	P3 - Moderate
Employment	P1 - Very Low	P3 - Moderate
Environmentally friendly (low carbon)	P2 - Low	P4 - High
Economic development	P2 - Low	P3 - Moderate
Battery Energy and Storage system	P2 - Low	P4 - High
Noise (alternative 1)	N2 - Low	N1 - Very Low
Noise (alternative 2)	N3 - Moderate	N2 - Low
Visual	N4 - High	N3 - Moderate
The shadow flicker	N3 - Moderate	N2 - Low
Traffic	N1 - Very Low	N1 - Very Low

Closure Phase		
Loss of employment	**N3 - Moderate**	**N2 - Low**
Reduced regional economic development	**N3 - Moderate**	**N2 - Low**
Associated infrastructure	**N3 - Moderate**	**N2 - Low**

Based on the SIA result, the proposed Project is recommended to proceed on the condition that the mitigation measures are implemented robustly and consistently.

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