Appendix I

EMPR

DFFE Reference Number: 14/12/16/3/3/2/2385

Igolide Wind (Pty) Ltd

IGOLIDE WIND ENERGY FACILITY (UP TO 100MW), NEAR FOCHVILLE, IN THE GAUTENG PROVINCE

Draft Environmental Management Programme

OCTOBER 2023

PUBLIC

Igolide Wind (Pty) Ltd

IGOLIDE WIND ENERGY FACILITY (UP TO 100MW), NEAR FOCHVILLE, IN THE GAUTENG PROVINCE

Draft Environmental Management Programme

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PROJECT NO. 41104569

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Draft Environmental Management Programme

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GLOSSARY

Abbreviation	Definition
AC	Alternating current
AEL	Atmospheric Emissions License
AIS	Alien and Invasive Species
ATNS	Air Traffic and Navigation Services
BESS	Battery Energy Storage System
BMS	Battery Management System
CA	Competent authority
CAA	Civil Aviation Authority
CARA	Conservation of Agricultural Resources Act (No. 43 of 1983)
CBA	Critical Biodiversity Area
CHSSP	Community Health, Safety and Security Plan
CCIA	Climate Change Impact Assessment
CSP	Concentrated Solar Power
DALRRD	Department of Agriculture Land Reform and Rural Development
DC	Direct current
DFFE	Department of Forestry, Fisheries and Environment
DMRE	Department of Mineral Resources and Energy
DR	District roads
DSR	Draft Scoping Report
DWS	Department of Water & Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act 73 of 1989
ECO	Environmental Control Officer

Abbreviation	Definition
EHS	Environmental Health and Safety
EI&ES	Ecological Importance and Ecological Sensitivity
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EP	Equator Principles
EPFI	Equator Principles Financial Institutions
ERA	Electricity Regulation Act (No. 4 of 2006)
ESA	Ecological Support Area
FI	Financial institutions
GA	General Authorisation
GHG	Greenhouse gas
GIIP	Good international industry practice
GNR	Government Notice Regulation
GSDM	Gert Sibande District Municipality
ha	Hectares
HIA	Heritage Impact Assessment
IBA	Important Bird & Biodiversity Area
ICAO	International Civil Aviation Organisation
IEP	National Integrated Energy Plan
IFC	International Finance Corporation
IRP	Integrated Resource Plan
LLM	Lekwa Local Municipality
LUPA	Land Use Planning Act (Act 3 of 2014)
MW	Megawatt
MCLM	Merafong City Local Municipality
NDP	National Development Plan
NEMA	National Environmental Management Act (Act 107 of 1998)

Abbreviation	Definition
NEMAQA	National Environmental Management: Air Quality Act 39 of 2004
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NEMPAA	National Environmental Management Protected Areas Act (No. 57 of 2003)
NHRA	National Heritage Resource Act (Act No. 25 of 1999)
NID	Notification of Intent to Develop
NPAES	National Protected Area Expansion Strategy 2010
NR	National Routes
NWA	National Water Act, 1998 (Act No. 36 of 1998)
O&M	Operational and maintenance
OHSA	Occupational Health and Safety Act (No. 85 of 1993)
PCS	Power Conditioning System
PICC	Presidential Infrastructure Coordinating Commission
PPP	Public Participation Process
PS	Performance Standards
PV	Photovoltaic
REC	Recommended ecological condition
REDZ	Renewable Energy Development Zones
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
RFI	Radio Frequency Interference
S&EIA	Scoping and EIA
SABS	South African Bureau of Standards
SACAA	South African Civil Aviation Authority
SAHRA	South African Heritage Resources Agency
SAHRA	South African Heritage Resources Agency
SALA	Subdivision of Agricultural Land Act
SANBI	South African National Biodiversity Institute
SANRAL	South African National Roads Agency

Abbreviation	Definition
SANS	South African National Standards
SARPs	Standards and Recommended Practices
SAWS	South African Weather Service
SDF	Spatial Development Frameworks
SDG	Sustainable Development Goals
SEF	Solar Energy Facilitates
SEP	Stakeholder Engagement Plan
SER	Stakeholder Engagement Report
SG	Surveyor General
SKA	Square Kilometre Array
TOPs	Threatened or Protected Species
UNDP	United Nations' Development Programmes
WBG	World Bank Group
WSP	WSP Group Africa (Pty) Ltd
WUA	Water Use Authorisation
WUL	Water Use License

1 INTRODUCTION

WSP Group Africa (Pty) Ltd (WSP) has been appointed by Igolide Wind (Pty) Ltd (hereafter the "Applicant"/"Project Developer"/"Project Company"), to undertake an Environmental Impact Assessment (EIA) to meet the requirements under the National Environmental Management Act (Act 107 of 1998) (NEMA), for the proposed Igolide Wind Energy Facility (WEF) and its associated infrastructure, including an on-site Independent Power Producer (IPP) substation, located northeast of Fochville in the Merafong West Local Municipality (MLM) in the Gauteng Province (**Figure 1-1**).

The proposed development is subject to a Scoping and EIA (S&EIA) Process in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA) (as amended) and Appendix 2 and 3 of the EIA Regulations, 2014 promulgated in Government Gazette 40772 and GN R326, R327, R325 and R324 on 7 April 2017. The competent authority for this S&EIA Process is the national Department of Forestry, Fisheries and Environment (DFFE).

1.1 BACKGROUND INFORMATION

Igolide Wind (Pty) Ltd, proposes to establish the up to 100MW Igolide Wind Energy Facility (WEF) (hereafter the 'Project'), and associated infrastructure, including an on-site IPP substation, near Fochville in Gauteng. The proposed WEF triggers a Scoping and Environmental Impact Reporting (S&EIR) process in terms of Sections 24 and 24D of the National Environmental Management Act (NEMA) (No. 107 of 1998), as read with GNR 983, GNR 984 and GNR 985 (as amended). The extent of the Project footprint will be approximately 64hectares (ha), including linear infrastructure (i.e., roads).

The proposed project will comprise the following key components (**Table 1-1**):

Table 1-1 - Proposed key components of the project

Igolide WEF	Description
Capacity:	Up to 100MW
Project Footprint	64 ha (including linear infrastructure, i.e., roads)
No. of turbines:	10
Turbine hub height:	Up to 200m
Rotor Diameter:	Up to 200m
Tip Height :	Up to 300m
Foundation:	Approximately 25m diameter x 3m deep. Volume to be excavated will be approximately 2 200m^3, in sandy soils due to access requirements and safe slope stability requirements.
Turbine Hardstand:	Hardstand does not require concrete. Area required will be approximately 1 ha per turbine.
Tower Type	Steel or concrete towers can be utilised at the site. Alternatively, the towers

Igolide WEF	Description
	can be of a hybrid nature, comprising concrete towers and top steel sections.
On-site IPP substation and battery energy storage system (BESS):	The total footprint for the on-site substation, including the BESS, will be up to 2.5ha in extent. The on-site IPP portion substation will consist of a high voltage substation yard to allow for multiple 132kV feeder bays and transformers, control building, telecommunication infrastructure, and other substation components, as required. A 500m buffer around the on-site IPP substation has been assessed to ensure flexibility in routing the powerline. The BESS storage capacity will be up to 400 megawatt-hour (MWh). 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 as 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. The BESS components will arrive on site pre-assembled.
Grid (to form part of a separate application for EA)	A single or double circuit 132kV overhead powerline and 132kV switching station (with a footprint of approximately 1.5ha, to be located adjacent to the on-site IPP substation) to feed the electricity generated by the proposed WEF into the national grid. A corridor of up to 250m in width (125m on either side of the centre line) has been identified for the placement of the 132kV single or double circuit power line to allow flexibility in the design of the final powerline route, and for the avoidance of sensitive environmental features (where possible).
Cables:	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, connecting the turbines to the on-site IPP substation.
Operations and Maintenance (O&M) building and storerooms:	The Operations and Maintenance ("O&M") building footprint will be located near the on-site substation. Typical areas include: ▪ Operations building of ~ 200m^2 ▪ Workshop and stores area of ~300m^2 ▪ Refuse area for temporary waste storage and conservancy tanks to service ablution facility. The total combined area of the buildings will not exceed 5 000m^2.
Construction camps:	The construction camp will house the contractor offices, ablution facilities, mess area, etc., and will have a footprint of approximately 1ha. The construction camp will be demolished after commercial operations date and the area rehabilitated. .
Temporary laydown or staging areas:	The laydown area will be used for the storage of equipment or components that will be incorporated into the facility (such as electrical cables) as well as non-facility related equipment and components such as shipping frames, concrete shuttering, etc. The laydown area will also be used for the storage (and filling of vehicles) of diesel fuel. The laydown area will have a footprint of approximately 2ha, however, this could increase to 3ha for concrete towers

Igolide WEF	Description
	(should they be required). The laydown area will be demolished after commercial operations date and the area rehabilitated.
Cement Batching Plant (temporary):	The cement batching plant will be used to mix and blend cement, water, sand and aggregates to form quality concrete to be used for foundations. The cement batching plant will have a footprint of approximately 1ha.
Access and Internal Roads:	Access and internal roads will have a width of 8 - 10m, increasing up to 20m for turning circle/bypass areas to allow for larger component transport. The access and internal roads will be placed within a corridor of up to 20m width to accommodate cable trenches, stormwater channels and turning circle/bypass areas of up to 20m. Existing access roads will be used where possible to minimise impact. Where required, the width of the existing roads will be widened to ensure the passage of vehicles.
Supporting Infrastructure:	▪ Fencing; ▪ Lighting; ▪ Lightning protection; ▪ Telecommunication infrastructure; ▪ Stormwater channels; ▪ Water pipelines; ▪ Offices; ▪ Operational and control centre; ▪ Operations and maintenance area / warehouse / workshop; ▪ Ablution facilities; ▪ Gatehouse; ▪ Security building; ▪ Visitor's centre; and ▪ Substation building.

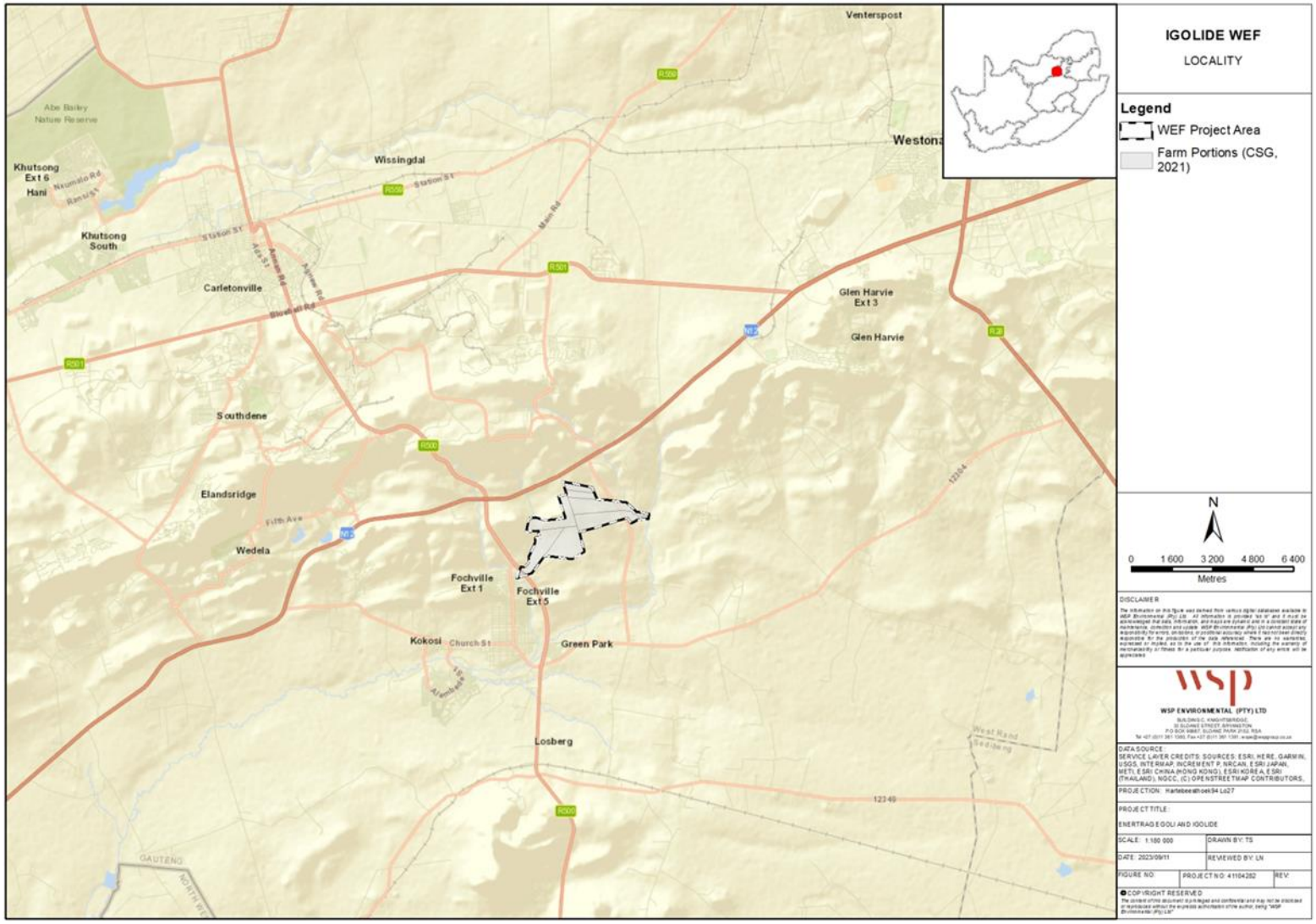


Figure 1-1 –Regional locality map of the Igolide WEF Development

1.2 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

WSP was appointed in the role of Independent Environmental Assessment Practitioner (EAP) to undertake the S&EIA process for the proposed project. The CV of the EAP is available in **Appendix A**. The EAP declaration of interest and undertaking is included in **Appendix B**. **Table 1-2** details the relevant contact details of the EAP.

Table 1-2 – Details of the EAP

EAP:	WSP Group Africa (Pty) Ltd
Contact Person:	Ashlea Strong
Physical Address:	Building C, Knightsbridge, 33 Sloane Street, Bryanston, Johannesburg
Postal Address:	P.O. Box 98867, Sloane Park 2151, Johannesburg
Telephone:	011 361 1392
Fax:	011 361 1301
Email:	Ashlea.Strong@wsp.com
EAP Qualifications:	▪ Masters in Environmental Management, University of the Free State ▪ B Tech, Nature Conservation, Technikon SA ▪ National Diploma in Nature Conservation, Technikon SA
EAPASA Registration Number:	EAPASA (2019/1005)

1.3 PURPOSE OF THE EMPR

An EMPr is defined as “an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented or mitigated, and that the positive benefits of the projects are enhanced.”

This EMPr has been compiled in accordance with Appendix 4 of GNR 982, in compliance with section 24N of NEMA, with the purpose of ensuring that negative impacts are reduced, and positive effects are enhanced through a process of continual improvement, during the construction, operational and decommissioning phases for the Igolide WEF.

To facilitate compliance to the EMPr by appointed contractors and sub-contractors, it is required that all onsite personnel are aware of the requirements of the EMPr as well as the prescribed penalties should a non-conformance be identified during the construction, operation and decommissioning activities.

Further to the above, appointed contractors and sub-contractors will also be required to comply with all relevant legislation and standards.

A hard copy of the EMPr must always be in the site office and made available to officials at request.

1.3.1 EMPR OBJECTIVES

The EMPr has the following objectives:

- Identify mitigation measures and environmental specifications which are required to be implemented for the planning, construction and rehabilitation, operation, and decommissioning phases of the project in order to manage and minimise the extent of potential environmental impacts associated with the facility;
- Ensure that all the phases of the proposed project do not result in undue or reasonably avoidable adverse environmental impacts, and ensure that any potential environmental benefits are enhanced;
- Identify entities responsible for the implementation of the measures and outline functions and responsibilities;
- Create management structures that address the concerns and complaints of interested and affected parties (I&APs) with regards to the proposed project;
- Propose mechanisms and frequency for monitoring compliance, and preventing long-term or permanent environmental degradation; Comply with all applicable laws, regulations, standards and guidelines for the protection of the environment;
- Train onsite personnel with regard to their environmental obligations; and
- Facilitate appropriate and proactive responses to unforeseen events or changes in project implementation that was not considered in the S&EIA process.

1.3.2 ENVIRONMENTAL OBJECTIVES AND TARGETS

To facilitate compliance to the EMPr, Igolide WEF must comply with all relevant legislation and standards and make all personnel aware of the requirements of the EMPr, as well as the prescribed penalties should a non-conformance be identified during the different phases of the proposed Project.

It is recommended that environmental objectives (as outlined in this document) be emphasised as minimum requirements. Objectives include:

- Encourage good management practices through planning and commitment to environmental issues; and
- Provide rational and practical environmental guidelines to:
- Minimise disturbance of the natural environment;
- Minimise fugitive emissions;
- Minimise impact of added traffic into the area;
- Ensure surface and groundwater resource protection;
- Prevent or minimise all forms of pollution;
- Protect indigenous flora and fauna;
- Prevent soil erosion;
- Promote sustainable use of resources;
- Adopt the best practical means available to prevent or minimise adverse environmental impacts;
- Comply with all applicable laws, regulations, standards and guidelines for the protection of the environment;
- Promote the reduction, reuse, recycling and recovery of waste;
- Develop waste management practices based on prevention, minimisation, recycling, treatment or disposal of waste;

- Describe all monitoring procedures required to identify impacts on the environment;
- Define how the management of the environment is reported and performance evaluated; and
- Train onsite personnel with regard to their environmental obligations.

1.4 STRUCTURE OF THE EMPR

For the purposes of demonstrating legal compliance, **Table 1-3** cross-references the sections within the EMPr with the requirements as per Appendix 4 of GNR 326 of 2017.

Table 1-3 – Legislation Requirements as detailed in Appendix 4 of GNR 326

Appendix 4	Legislated Requirements as detailed in Appendix 4 of GNR 326	Relevant Report Section
(a)	details of-	
	(i) the EAP who prepared the EMPr; and	**Section 1.2**
	(ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	**Section 1.2** **Appendix A**
(b)	a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	**Section 2**
(c)	a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;	**Section 3** **Appendix C**
(d)	A description of the impact management outcomes, 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-	**Section 3.2 and Section 7**
	(i) planning and design;	
	(ii) pre-construction activities;	
	(iii) construction activities;	
	(iv) rehabilitation of the environment after construction and where applicable post closure; and	
	(v) where relevant, operation activities;	
(f)	a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to -	**Section 7**
	(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	
	(ii) comply with any prescribed environmental management standards or practices;	

Appendix 4	Legislated Requirements as detailed in Appendix 4 of GNR 326	Relevant Report Section
	(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and	
	(iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable	
(g)	the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	**Section 6**
(h)	the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	**Section 6**
(i)	an indication of the persons who will be responsible for the implementation of the impact management actions;	**Section 6 / Section 7**
(j)	the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	**Section 7**
(k)	the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	**Section 6**
(l)	a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations	**Section 6 / Section 7**
(m)	an environmental awareness plan describing the manner in which-	**Section 6.2**
	(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and	
	(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	
(n)	any specific information that may be required by the competent authority	N/A

2 PROJECT DESCRIPTION

This section provides a description of the location of the project and a summary of the project details. The descriptions encompass the activities to be done during the construction, operational and decommissioning (should it be decided that the facility will be decommissioned) phases.

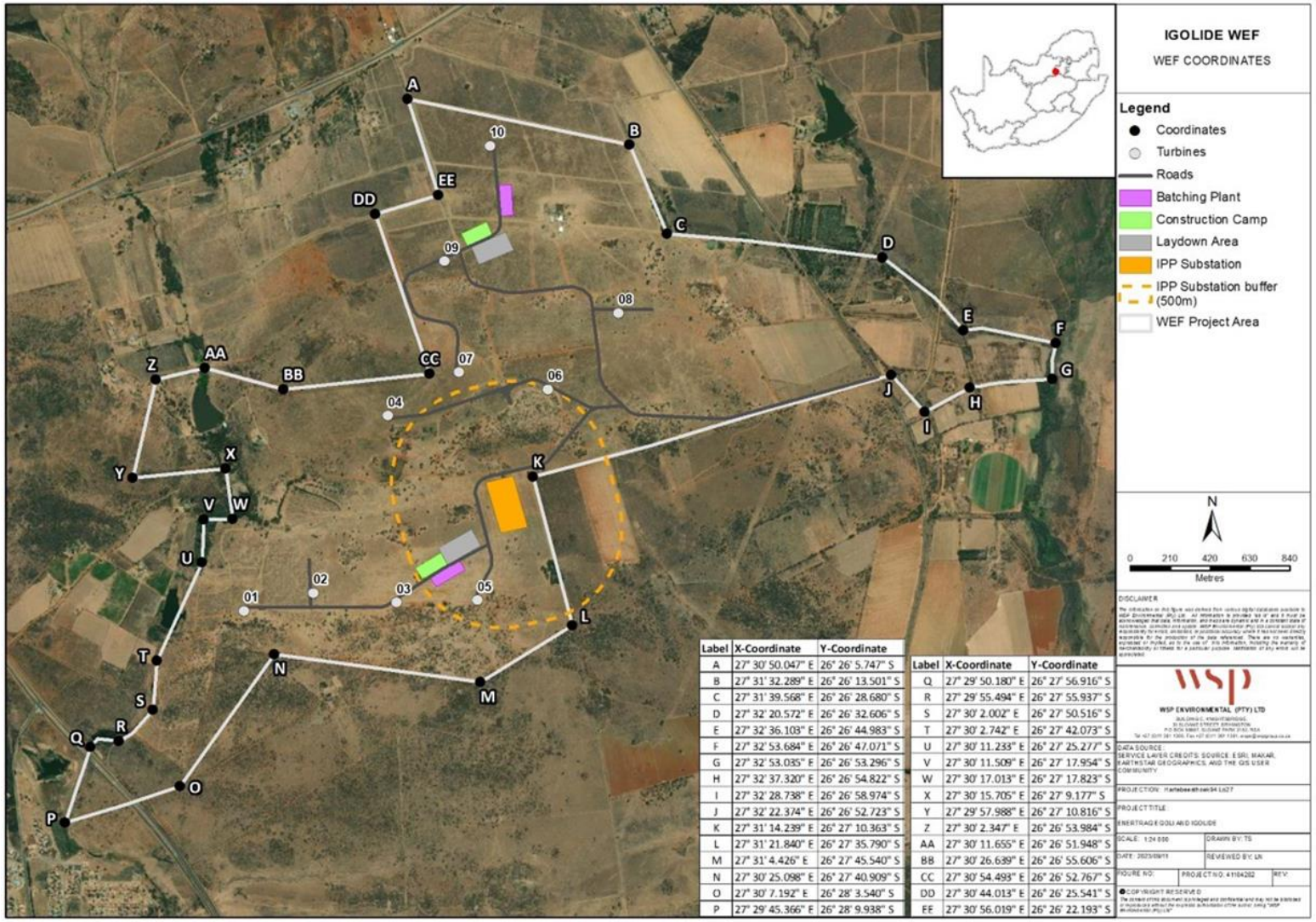
2.1 LOCATION OF THE PROPOSED PROJECT

The proposed project will be developed within a project area of approximately 680 ha. Within this project area, the extent of the Project footprint will be approximately 64 ha, including linear infrastructure (i.e., roads). The Project is located approximately 6km northeast of Fochville, within the Merafong City Local Municipality (MCLM) in the Gauteng Province.

The details of the properties associated with the proposed project, are outlined in **Table 2-1**. The coordinates of the project site are indicated in **Table 2-1** and **Figure 2-1**,. The Final Layout for the Igolide WEF is illustrated in **Figure 2-2**.

Table 2-1 – Affected Farm Portions

Farm Name	21 Digit Surveyor General Code of Each Cadastral Land Parcel
Portion 14 of Farm Kraalkop 147IQ	T0IQ00000000014700014
Portion 20 of Farm Kraalkop 147IQ	T0IQ00000000014700020
Portion RE/22 of Farm Kraalkop 147IQ	T0IQ00000000014700022
Portion 8 of Farm Leeuwpoort 356IQ	T0IQ00000000035600008
Portion 57 of Farm Leeuwpoort 356IQ	T0IQ00000000035600057
Portion 65 of Farm Leeuwpoort 356IQ	T0IQ00000000035600065
Portion 66 of Farm Leeuwpoort 356IQ	T0IQ00000000035600066



Label	X-Coordinate	Y-Coordinate
A	27° 30' 50.047" E	26° 26' 5.747" S
B	27° 31' 32.289" E	26° 26' 13.501" S
C	27° 31' 39.568" E	26° 26' 28.680" S
D	27° 32' 20.572" E	26° 26' 32.606" S
E	27° 32' 36.103" E	26° 26' 44.983" S
F	27° 32' 53.684" E	26° 26' 47.071" S
G	27° 32' 53.035" E	26° 26' 53.296" S
H	27° 32' 37.320" E	26° 26' 54.822" S
I	27° 32' 28.738" E	26° 26' 58.974" S
J	27° 32' 22.374" E	26° 26' 52.723" S
K	27° 31' 14.239" E	26° 27' 10.363" S
L	27° 31' 21.840" E	26° 27' 35.790" S
M	27° 31' 4.426" E	26° 27' 45.540" S
N	27° 30' 25.098" E	26° 27' 40.909" S
O	27° 30' 7.192" E	26° 28' 3.540" S
P	27° 29' 45.366" E	26° 28' 9.938" S

Label	X-Coordinate	Y-Coordinate
Q	27° 29' 50.180" E	26° 27' 56.916" S
R	27° 29' 55.494" E	26° 27' 55.937" S
S	27° 30' 2.002" E	26° 27' 50.516" S
T	27° 30' 2.742" E	26° 27' 42.073" S
U	27° 30' 11.233" E	26° 27' 25.277" S
V	27° 30' 11.509" E	26° 27' 17.954" S
W	27° 30' 17.013" E	26° 27' 17.823" S
X	27° 30' 15.705" E	26° 27' 9.177" S
Y	27° 29' 57.988" E	26° 27' 10.816" S
Z	27° 30' 2.347" E	26° 26' 53.984" S
AA	27° 30' 11.655" E	26° 26' 51.948" S
BB	27° 30' 26.639" E	26° 26' 55.606" S
CC	27° 30' 54.493" E	26° 26' 52.767" S
DD	27° 30' 44.013" E	26° 26' 25.541" S
EE	27° 30' 56.019" E	26° 26' 22.193" S

Figure 2-1 - Igolide WEF Conceptual Layout map (with corner coordinates) (assessed in the EIA Phase)

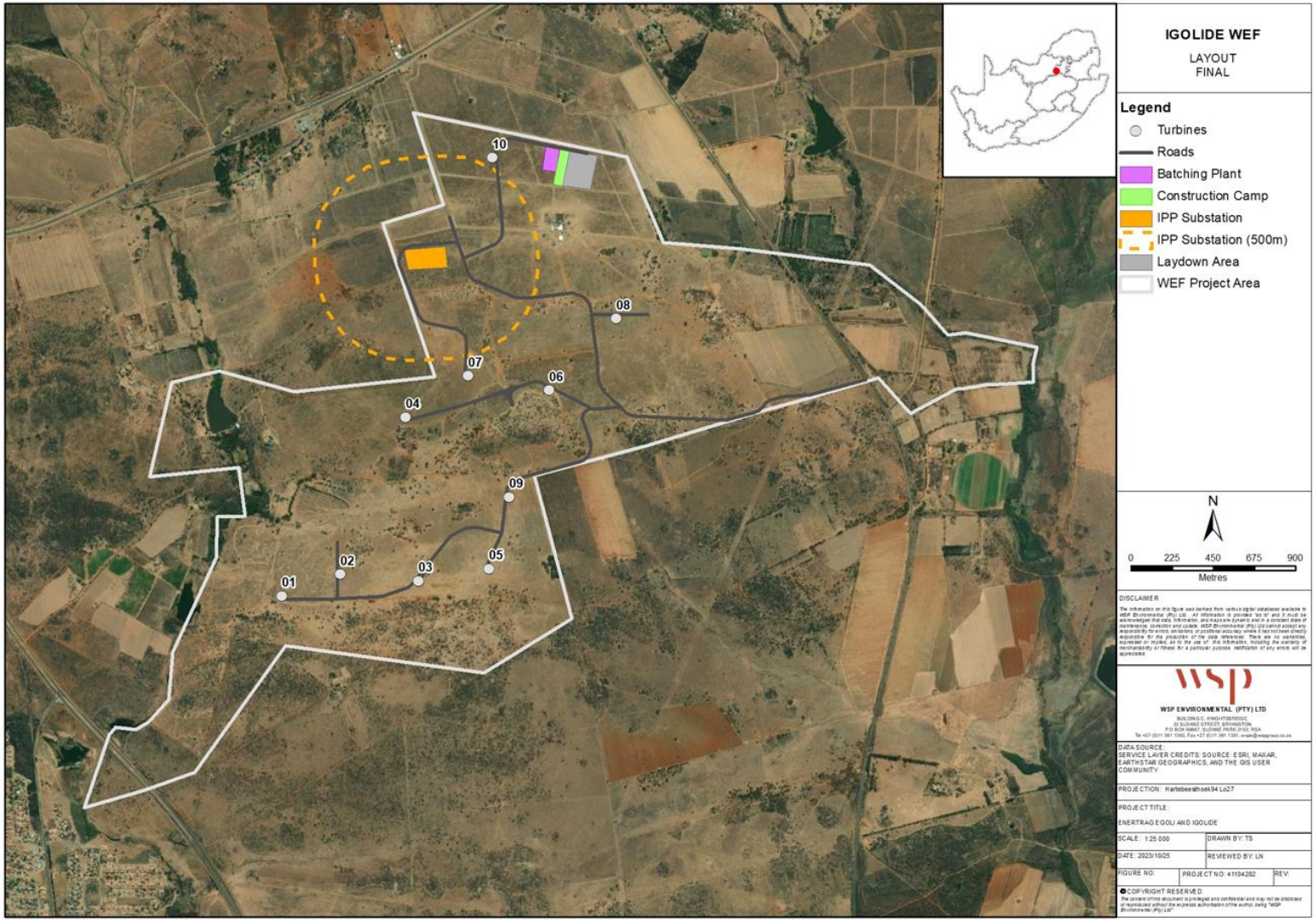


Figure 2-2 – Igolide WEF – Final Layout for Approval

Table 2-2 – Coordinate Points of the Cadastral Land Parcel

Point	Longitude	Latitude
A	27° 30' 50.047" E	26° 26' 5.747" S
B	27° 31' 32.289" E	26° 26' 13.501" S
C	27° 31' 39.568" E	26° 26' 28.680" S
D	27° 32' 20.572" E	26° 26' 32.606" S
E	27° 32' 36.103" E	26° 26' 44.983" S
F	27° 32' 53.684" E	26° 26' 47.071" S
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H	27° 32' 37.320" E	26° 26' 54.822" S
I	27° 32' 28.738" E	26° 26' 58.974" S
J	27° 32' 22.374" E	26° 26' 52.723" S
K	27° 31' 14.239" E	26° 27' 10.363" S
L	27° 31' 21.840" E	26° 27' 35.790" S
M	27° 31' 4.426" E	26° 27' 45.540" S
N	27° 30' 25.098" E	26° 27' 40.909" S
O	27° 30' 7.192" E	26° 28' 3.540" S
P	27° 29' 45.366" E	26° 28' 9.938" S
Q	27° 29' 50.180" E	26° 27' 56.916" S
R	27° 29' 55.494" E	26° 27' 55.937" S
S	27° 30' 2.002" E	26° 27' 50.516" S
T	27° 30' 2.742" E	26° 27' 42.073" S
U	27° 30' 11.233" E	26° 27' 25.277" S
V	27° 30' 11.509" E	26° 27' 17.954" S
W	27° 30' 17.013" E	26° 27' 17.823" S
X	27° 30' 15.705" E	26° 27' 9.177" S
Y	27° 29' 57.988" E	26° 27' 10.816" S
Z	27° 30' 2.347" E	26° 26' 53.984" S

Point	Longitude	Latitude
AA	27° 30' 11.655" E	26° 26' 51.948" S
BB	27° 30' 26.639" E	26° 26' 55.606" S
CC	27° 30' 54.493" E	26° 26' 52.767" S
DD	27° 30' 44.013" E	26° 26' 25.541" S
EE	27° 30' 56.019" E	26° 26' 22.193" S

2.2 WIND ENERGY POWER GENERATION PROCESS

Wind power is the conversion of wind energy into a useful form of energy, such as electricity, using modern and highly reliable wind turbines. Wind Power is non-dispatchable, meaning that for economic operation, all the available output must be taken when it is available.

Wind turbines, like windmills, are mounted on a tower to harness wind energy at an increased level above the ground where wind is faster and less turbulent. The kinetic energy of the wind is used to turn the blades of the turbine to generate electricity. Wind turbines can operate at varying wind speeds, with the amount of energy the wind transfers to the rotor depending on the density of the air, the rotor area and the wind speed.

The electricity generated by the wind turbines is passed through the step-up transformer and then transmitted via either underground or overhead cables to a central substation, which connects the wind energy facility to a high voltage network. Wind turbines are designed to operate automatically with minimal maintenance for approximately 20-25 years.

Figure 2-3 illustrates the following main components of a wind turbine:

- The rotor consists of three blades which are attached to a hub. The blades collect energy from the wind and converts the wind energy into rotational shaft motion/energy to turn the generator;
- The nacelle houses the equipment at the top of the tower as well as a gearbox, a generator that converts the turning motion/mechanical energy of the blades into electricity and coupling and brake;
- The tower supports the nacelle and rotor and allows the blades to be distanced safely off the ground so as to reach the stronger winds found at higher elevations;
- Turbine step-up transformer which can be indoor or outdoor, depending on the turbine model whose function is to increase the voltage capacity of the electricity generated by the turbine to a higher, grid-equivalent.
- The foundation unit ensures the stability of the turbine structure.

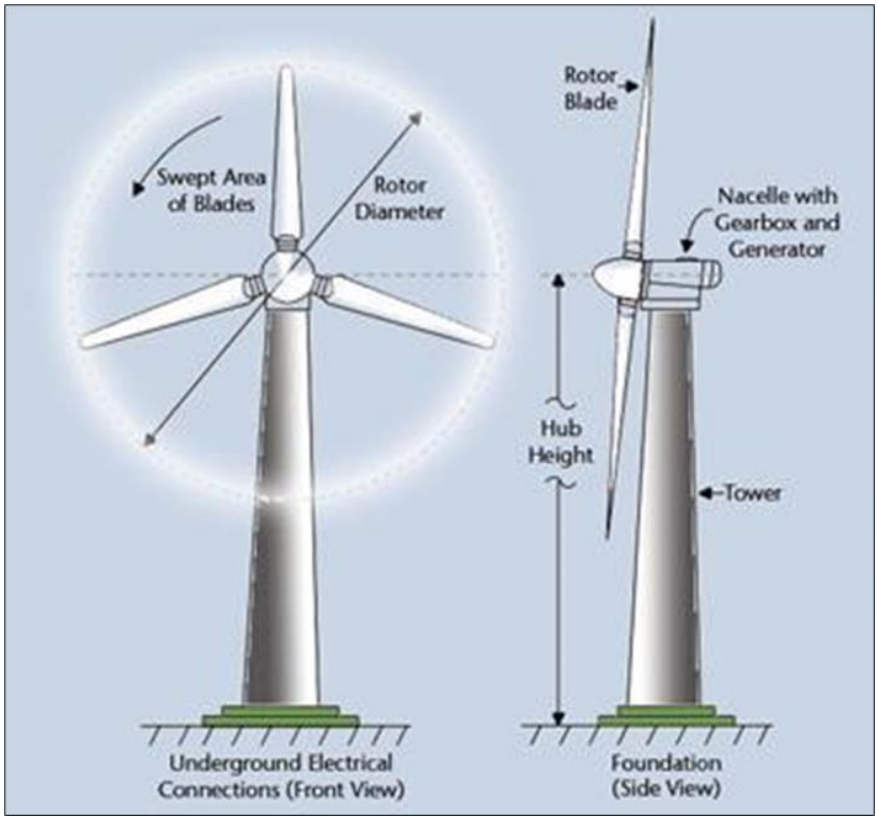

Figure 2-3 - Illustration of the main components of a wind turbine

2.3 PROJECT INFRASTRUCTURE

The proposed Igolide WEF will be developed with an installed capacity of up to 100 MW. The proposed Igolide WEF will comprise the following key components as discussed below.

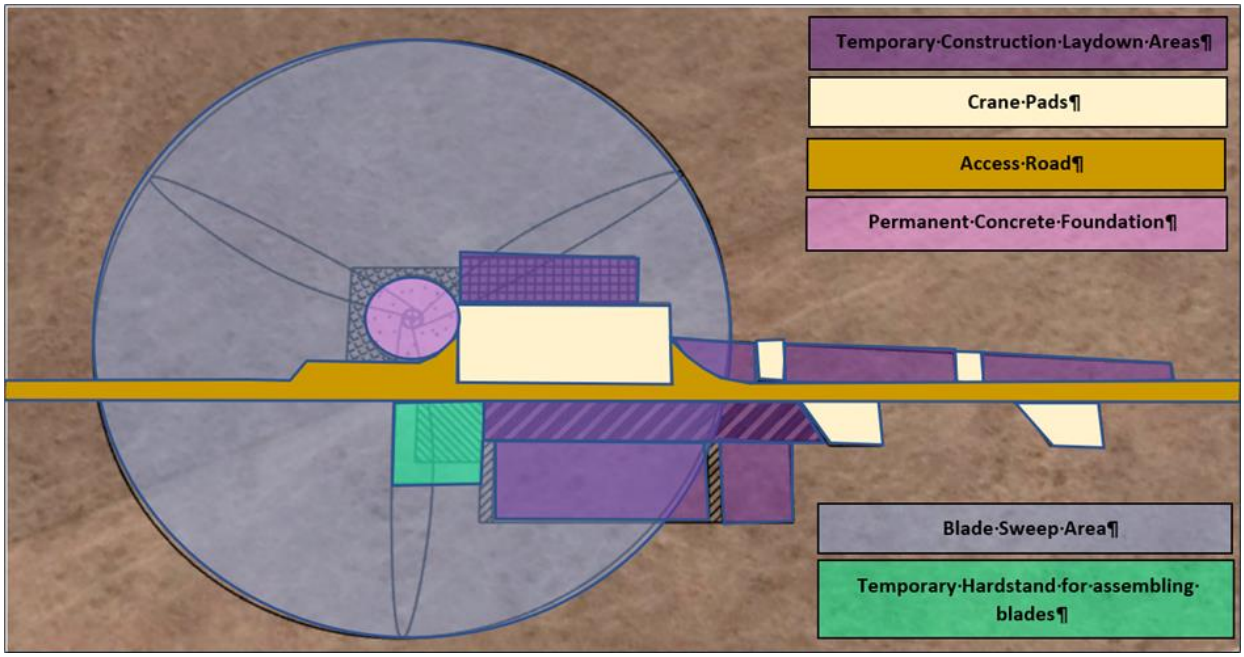

Figure 2-4 - Typical Turbine Hard Standing Requirements (illustration purposes only)

2.3.1 WIND TURBINES

- Up to 10 turbines, each with a foundation of approximately 25m in diameter and approximately 3m in depth;
- Turbine hub height of up to 200m;
- Rotor diameter of up to 200m;
- Tip height of up to 300m;
- Hard standing area: approximately 1 ha will be required per turbine; and
- Tower type: Steel or concrete towers can be utilised at the site. Alternatively, the towers can be of a hybrid nature, comprising concrete towers and top steel sections.

2.3.2 ON-SITE IPP SUBSTATION AND BATTERY ENERGY STORAGE SYSTEM (BESS)

- The total footprint for the on-site substation, including the BESS, will be up to 2.5ha in extent.
- The on-site IPP portion substation will consist of a high voltage substation yard to allow for multiple 132kV feeder bays and transformers, control building, telecommunication infrastructure, and other substation components, as required. A 500m buffer around the on-site IPP substation has been assessed to ensure flexibility in routing the powerline.
- The BESS storage capacity will be up to 400 megawatt-hour (MWh). 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 as 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. The BESS components will arrive on site pre-assembled.

2.3.3 CABLING

- 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, connecting the turbines to the on-site IPP.

2.3.4 OPERATION AND MAINTENANCE BUILDING INFRASTRUCTURE

O&M building infrastructure will be required to support the functioning of the Wind Facility and for services required by operations and maintenance staff. The O&M building infrastructure will include:

- The O&M building footprint will be located near the on-site substation. Typical areas include:
- Operations building of ~200m^2;
- Workshop and stores area – of ~300m^2; and
- Refuse area for temporary waste storage and conservancy tanks to service the ablution facility.

The total combined area of the buildings will not exceed 5 000m^2.

2.3.5 CONSTRUCTION CAMP, LAYDOWN AND BATCHING PLANT

- The construction camp will house the contractor offices, ablution facilities, mess area, etc., and will have a footprint of approximately 1ha. The construction camp will be demolished after commercial operations date and the area rehabilitated.

- The laydown area will be used for the storage of equipment or components that will be incorporated into the facility (such as electrical cables) as well as non-facility related equipment and components such as shipping frames, concrete shuttering, etc. The laydown area will also be used for the storage (and filling of vehicles) of diesel fuel. The laydown area will have a footprint of approximately 2ha, however, this could increase to 3ha for concrete towers (should they be required). The laydown area will be demolished after commercial operations date and the area rehabilitated.; and
- The cement batching plant will be used to mix and blend cement, water, sand and aggregates to form quality concrete to be used for foundations. The cement batching plant will have a footprint of approximately 1ha.

2.3.6 ACCESS ROAD AND INTERNAL ROADS

- Access and internal roads will be approximately 8 - 10m in width, increasing up to 20m for turning circle/bypass areas to allow for larger component transport. The access and internal roads will be placed within a corridor of up to 20m width to accommodate cable trenches, stormwater channels and turning circle/bypass areas of up to 20m.
- Existing access roads will be used to minimise impact. Where required, the width of the existing roads will be widened to ensure the passage of vehicles.

2.3.7 SUPPORTING INFRASTRUCTURE

Other Infrastructure located within the project footprint includes:

- Fencing;
- Lighting;
- Lightning protection;
- Telecommunication infrastructure;
- Stormwater channels;
- Water pipelines;
- Offices;
- Operational control centre;
- Operations and maintenance area / warehouse / workshop;
- Ablution facilities;
- Gatehouse;
- Security building;
- Visitor's centre; and
- Substation building.

2.4 PROPOSED PROJECT DEVELOPMENT ACTIVITIES

The typical steps involved in the construction and operation of a wind energy facility is summarised below:

- Planning Phase
  - Step 1: Surveying of the development area and negotiation with affected landowners; and
  - Step 2: Final design and micro-siting of the infrastructure based on geotechnical, topographical conditions and potential environmental sensitivities.

- Construction Phase
  - Step 3: Vegetation clearing and construction of access roads/tracks (where required);
  - Step 4: Construction of turbine tower structure foundations;
  - Step 5: Assembly and erection of infrastructure on site; and
  - Step 6: Rehabilitation of disturbed areas and protection of erosion sensitive areas.
- Operation Phase
  - Step 7: Continued maintenance during operation.

2.4.1 PLANNING PHASE

Surveys will be conducted prior to construction, This will include, but will not be limited to, a geotechnical survey, site survey, and confirmation of the turbine micro-siting footprint, and survey of the on-site substation site to determine and confirm the locations of all associated infrastructure.

Site establishment will include clearing of vegetation and topsoil at the footprint of each turbine, for laydown area, batching plant and access routes. The temporary laydown area will be constructed, including establishment of the construction camp (temporary offices, storage containers, concrete batching plant etc). Site establishment will also entail the installation and/or connection of services (sanitation, electricity, etc).

2.4.2 CONSTRUCTION PHASE

The construction process will follow industry standard methods and techniques. Key activities associated with the construction phase are described in **Table 2-3**.

Table 2-3 - Construction activities

Activity	Description
Transport of components and equipment to site	Bulk materials (aggregate, steel etc.), infrastructure components (masts, blades, tower sections etc), lifting and construction equipment (excavators, trucks, compaction equipment etc.) will be sourced and transported to site via suitable National and provincial routes and designated access roads. The infrastructure components may be defined as abnormal loads in terms of the Road Traffic Act (No. 29 of 1989) due to their large size and abnormal lengths and loads for transportation. A permit may be required for the transportation of these loads on public roads.
Excavation, earthworks and construction of foundations	Subject to the determination of founding specifications, earthworks will be required. This is likely to entail: Excavation of foundation holes to a depth of approximately 3m and pouring of concrete foundations of approximately 500 – 650m^3 from the batching plant. Concrete foundations will be constructed at each turbine location. Please note these dimensions may be larger as required by the geotechnical conditions. Levelling of the construction camp area, on-site substation area, and O&M building area, and excavation of foundations prior to construction. Excavation of trenches for the installation of underground cables.
Construction of wind turbines, site substation and BESS	A large lifting crane(s) will be required to lift the turbine sections (nacelle, blades) into place. The lifting crane/s will be brought on site and will be required to move between the turbine site. Cranes of varying sizes may be required depending on the

Activity	Description
	size of the components. An on-site IPP substation will be constructed on the site. The wind turbines will be connected to the on-site IPP substation via underground or overhead (if required) up to 33kV electrical cables. The BESS will typically require the placement of multiple containers to house the BESS components.
Establishment of ancillary infrastructure	Ancillary infrastructure will include construction site office, temporary laydown area and workshop area for contractor's equipment. Establishment of the ancillary infrastructure will require the clearing of vegetation, levelling, and the excavation of foundations prior to construction.
Rehabilitation	Once all construction is completed on site and all equipment and machinery has been removed from the site, the site will be rehabilitated. On commissioning, access points to the site not required during the operation phase will be closed and prepared for rehabilitation.

2.4.3 OPERATIONAL PHASE

The proposed Igolide WEF is anticipated to have a minimum life of 20 years. The facility will operate for 24 hours, 7 days a week. While the project is self-sufficient, maintenance and monitoring activities will be required. Potable water requirements for permanent staff will be limited. During the operational phase there will be little to no Project-related movement along the servitudes as activities are limited to maintaining the servitude (including maintenance of access roads and cutting back or pruning of vegetation to ensure that vegetation does not affect the WEF), inspection of the WEF infrastructure and repairs when required. Limited impact is expected during operation since there will not be any intrusive work done outside of maintenance in the event that major damage occurs to site infrastructure. Operation of the WEF will involve the following activities, discussed below.

- Servitude and access road maintenance is aimed at eliminating hazards and facilitating continued access to the WEF. The objective is to prevent all forms of potential interruption of power supply due to overly tall vegetation/climbing plants or establishment of illegal structures within the right servitude. It is also to facilitate ease of access for maintenance activities on the WEF. During the operational phase of the project, the servitude will be maintained to ensure that the functions optimally and does not compromise the safety of persons within the vicinity of the WEF.
- Igolide WEF will develop comprehensive planned and emergency programmes through its technical operations during the operation and maintenance phase for the WEF. The maintenance activities will include:
  - Periodic physical examination of the WEF and its safety, security and integrity.
  - Defects that are identified will be reported for repair. Such defects may include defective conductors, flashed over insulators, defective dampers, vandalised components, amongst others.
  - Maintenance / repairs will then be undertaken.

2.4.4 DECOMMISSIONING PHASE

Following the initial 20-year operational period of the wind facility, the continued economic viability will be investigated. If the facility is still deemed viable, the life of the facility will be extended. The

facility will only be decommissioned once it is no longer economically viable. If a decision is made to completely decommission the facility, this will be subject to a separate authorisation and impact assessment process, all the components will be disassembled, reused and recycled or disposed. The site would be returned to its current use i.e., residential, mixed farming, commercial hunting, and tourism purposes..

2.5 NEED AND DESIRABILITY OF THE PROJECT

South Africa is faced with significant increases in electricity demand and a shortage in electricity supply. South Africa is the seventh highest coal producer in the world, with approximately 77% of the country's electricity generated from coal. This large dependence on coal and its use has also resulted in a variety of negative impacts on the environment, including the contribution to climate change. South Africa is also the highest emitter of greenhouse gases in Africa; attributed to the country's energy-intensive economy that largely relies on coal-based electricity generation.

Renewable energy development is regarded as an important contribution to meeting international and national targets of reducing reliance on fossil fuels, such as coal, which contribute towards greenhouse gas emissions and resultant climate change. The need and desirability of proposed Igolide WEF has been considered from an international, national, and regional perspective.

2.5.1 INTERNATIONAL PERSPECTIVE

The Project will greatly contribute to the countries' efforts to reduce their carbon emissions and play their role as part of the Paris Climate Accord. The Paris Agreement is a legally binding international treaty signed by 196 countries at the COP 21 in Paris, on the 12th of 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 which are driven by the global temperature increase. Therefore, to achieve this long-term temperature goal, countries aim to reach 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 would have a significant negative impact on agriculture. Studies have shown that climate change, including the drastic increases in the frequency and intensity of extremes events, have reduced food and water security, hindering efforts to meet Sustainable Development Goals.

The Kyoto Protocol, which was adopted in December 1997, is also relevant to the need of the Project. The protocol aimed to reduce the emission of gases that contribute to global warming. In force since 2005, the protocol called for reducing the emission of six greenhouse gases in 41 countries, plus the European Union, through actively cutting down on fossil fuels, or by utilising more renewable resources. The development of the Project will add capacity to the renewable energy sector of the country and strengthen the commitment and action plan to achieve the requirements, as set out in the protocol, through the generation of energy without the emission of greenhouse gases.

2.5.1 NATIONAL COMMITMENTS

The National Development Plan envisages that by 2030, South Africa would have an energy sector that produces sufficient energy to support industry at competitive prices, ensuring for poor

households, while reducing carbon emissions per unit of power by about one third. The National Development Plan states the procurement of 20 000MW of renewable energy by 2030, decommissioning of 11 000MW of ageing coal-fired power stations and stepping up investments in energy-efficiency as some of the infrastructure investments that should be prioritised in the Country.

The Project is proposed in specific response to the identified energy mix of South Africa as per the requirements set out in the Integrated Resource Plan (IRP) with regards to renewable energy targets. Thermal power comprised 92.4% of the total power capacity in South Africa in 2000. With a few plants decommissioned and capacities of other technologies increasing, the share of thermal power fell during 2000 – 2019, but not my much. With international pressure to reduce emissions, the Country announced plans to increase renewable power and reduce the share of thermal power, especially coal power. These plans were elucidated in the IRP of 2016 soon after signing the Paris Agreement. Later, the intention of reduce thermal power and increase renewable power was reaffirmed in the subsequently published IRP 2018 and IRP 2019.

The need for new power generation from wind energy facilities has been identified and assessed by government at a national scale, considering the national energy requirements as well as international commitments under the Paris Agreement; therefore, the provision has been made for the inclusion of new wind power generation capacity in South Africa's energy mix. The development of the Project has the potential to contribute positive towards the identified need, while simultaneously contributing to job creation and socio-economic development, identified as a need for the Country in the NDP.

In 2011, South Africa launched a competitive procurement programme for renewable energy called the Renewable Energy Independent Power Producer Procurement Program (REIPPPP) aimed at diversifying the Country's energy mix. Under the REIPPPP, the Department of Mineral Resources and Energy (DMRE) intends to secure 14 725MW of electricity from renewable energy generation facilities utilising either onshore wind, concentrated solar thermal, solar photovoltaic, biomass, biogas, landfill gas, or hydro across a number of bidding windows, while simultaneously contributing towards socio-economic development. The REIPPPP requires renewable energy companies to create local development benefits in an effort to reduce the weight of structural and systemic issues of poverty and inequality. Therefore, in addition to electricity generation and supply, the Project will also contribute positively towards the socio-economic development of a region, over and above job creation.

The proposed Igolide WEF will also aid in overcoming the power shortages that are currently faced in the country. In 2022, South Africa witnessed its longest recorded hours of load shedding, with the power being off for 859 hours of the year as shown in **Figure 2-5**. The South African Government has taken strides to try reducing these power cuts through the implementation of bid Windows in REIPPP and lifting the independent power generation threshold to 100MW, but it is still expected that the country will undergo more load shedding.

Over the years the construction of Wind facilities has become cheaper, and less time-consuming. Thus, acting as a faster and more efficient method of meeting the ever-growing demand for electricity in the country. In addition, the Council for Scientific and Industrial Research (CSIR) reported that renewable energy assisted in relieving pressure on the constrained South African power system during load shedding in the first quarter of 2019. This indicates that renewable energy is a key factor in ensuring that the country does not face further load shedding in the future.

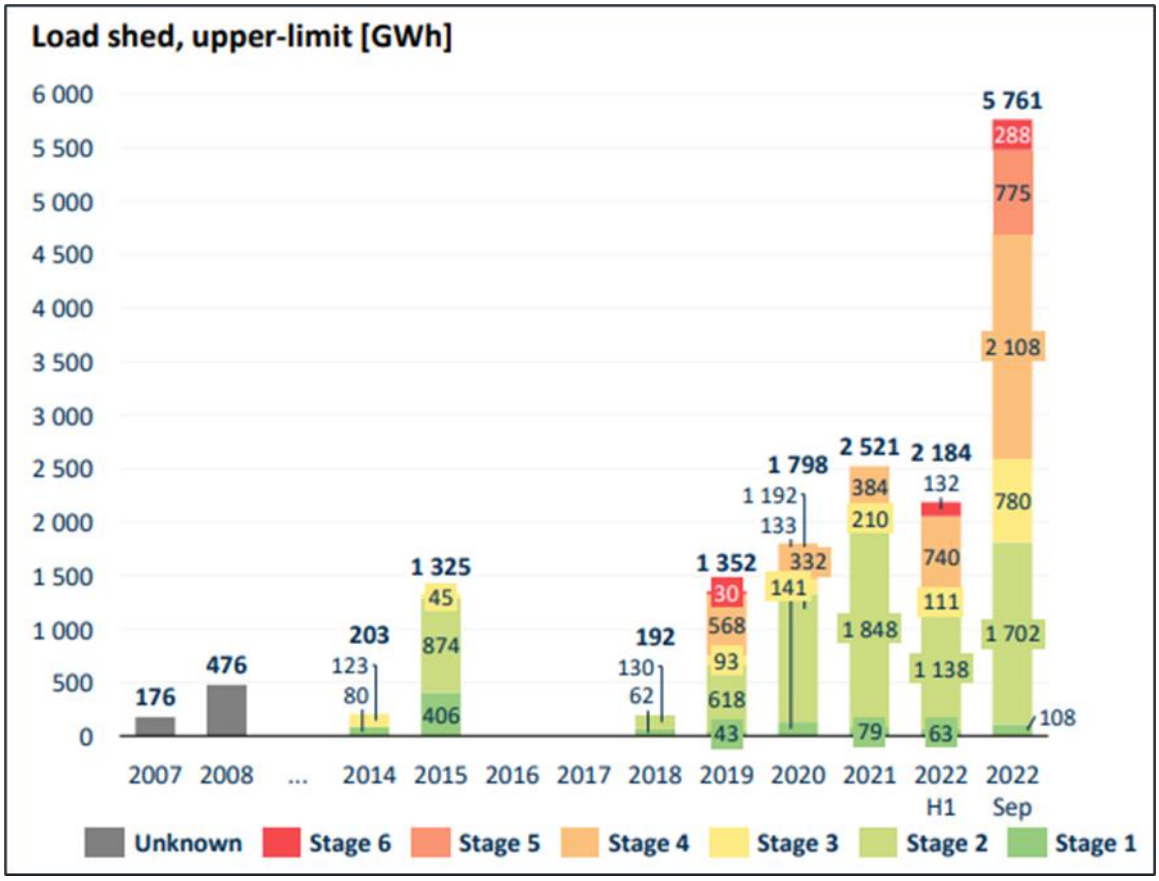

Figure 2-5 - Load shedding hours over the years in South Africa

Source: CSIR (2022)

2.5.2 NATIONAL PERSPECTIVE

2.5.2.1 National

Load shedding is the single biggest constraint on South Africa's economy. This has devasted critical economic sectors such as manufacturing, hospitality, tourism, mining and agriculture. Therefore, the Project will aid in assisting in overcoming the power shortages that are currently faced in the country. In 2022, South Africa endured 192 720 minutes of loadshedding, which is 200% more than any other year. The South African Government has taken strides to try reducing these power cuts through the implementation of bid Windows in REIPPPP and lifting the independent power generation threshold to 100 MW, but it is still expected that the country will undergo more load shedding. Over the years the construction of Wind and Wind facilities has become cheaper, and less time-consuming. Thus, acting as a faster and more efficient method of meeting the ever-growing demand for electricity in the country. Furthermore, after the COP26, South Africa signed an international partnership which will facilitate the funding of USD 8.5 billion from Germany, France, the USA, the UK and, the European Union over the next three to five years to aid in the country's transition towards a low-carbon economy. This opens an opportunity for renewable energy Independent Power Producers (IPPs) to aid in the countries quest to reduce its GHG emissions and help resolve the ongoing electricity crisis in the country.

The Council for Scientific and Industrial Research (CSIR) reported that renewable energy assisted in relieving pressure on the constrained South African power system during load shedding in the first

quarter of 2019. This goes to show that renewable energy is a key factor in ensuring that the country does not face further load shedding in the future.

2.5.2.2 Provincial

To deal with the energy crisis, the Gauteng Provincial Government (GPG) hosted the Energy Expo on 16 February 2023 under the theme “Growing Gauteng Together towards a sustainable energy mix”. The Expo aimed to provide a platform for showcasing solutions and technologies than can be incorporated into the GPG plans as well as to gain insights into stakeholder energy plans. The Gauteng government is committed to working with all spheres of government and stakeholders to end load shedding and ensure a stable supply of affordable power.

The provincial government’s strategic intent includes the following:

- Ensuring energy security for desirable economic growth.
- Ensuring universal, affordable and modern energy to all citizens of the Gauteng City Region.
- Diversifying energy source within the province to include renewables and other forms of energy.
- Promoting energy efficiency measures across of sectors of the economy and improving provincial energy governance and administration.

Additionally, the Gauteng government has established the Energy Emergency Council to respond to the worsening electricity supply crisis.

3 PROJECT ALTERNATIVES

The EIA Regulations of 2014 (as amended) require that the S&EIA process must identify and describe alternatives to the proposed activity that were considered, or motivation for not considering alternatives. Different types or categories of alternatives could be considered including different locations, technology types, and project layouts. At the scoping level the evaluation of alternatives is provided at a high level in the absence of detailed environmental comparators for each alternative; due to the two-staged nature of the S& EIA process it is more suitable to identify and describe the potential alternatives on a high-level basis within scoping, and to perform a more detailed analysis of alternatives (with environmental comparators) in the EIA phase of the project. As such, the S&EIA will holistically assess the impacts and risks of each alternative comparatively, as suggested by Appendix 2 of the EIA Regulations of 2014 (as amended).

All alternatives outlined below are considered both feasible and reasonable. An alternatives assessment has been undertaken and included in **Section 11.3** of the Draft EIA Report.

3.1 TECHNOLOGY ALTERNATIVES

Based on the extensive in-house scoping study done in the province, the Igolide WEF has been selected based on several factors, namely: wind resource, grid capacity and access to the national electricity grid, topography, site access, existing competition, land availability, land use and suitability, landowner support, and environmental constraints. These factors are further explained in the subsections below:

3.1.1 WIND RESOURCE

Wind resource is the first main driver of site selection and project viability when considering the development of wind energy facilities. The project site, which is located near the town of Fochville in the Gauteng Province, has good wind resource potential. The wind resource for the development site has been monitored using on-site monitoring devices over approximately 16 months and has proven to be competitive and equal to other projects in the country. The project developer explored the wind resource around South Africa, with specific focus on the Gauteng Province, and highlighted this area as being a strong site from a resource perspective. This viable resource ensures that best value for money is gained for the economy of South Africa.

3.1.2 GRID CAPACITY AND ACCESS TO THE NATIONAL ELECTRICITY GRID

Grid capacity is one of the main constraints to the expansion of wind energy projects and renewable energy projects at large in South Africa. The failure to appoint any wind projects in Bid Window 6 was attributed to an unavailability of grid capacity in the Eastern, Northern and Western Cape provinces, where all the wind projects submitted as part of Bid Window 6 are located. Unlike the Cape Provinces of South Africa, where there is abundant wind resources but no available grid capacity, the Project site provides the opportunity to connect to the Eskom grid. For this reason, the project developer, is developing the proposed Igolide Wind Energy Facility within the Gauteng area.

A key factor in the siting of any power generation project is a viable grid connection. The anticipated grid connection (subject to a separate environmental assessment and authorisation process) is a 132kV on-site substation (comprising IPP and Eskom portions) and a 132kV single or double circuit

overhead power line from the on-site substation to an existing substation. Various substations to which the Igolide WEF can connect exist in the vicinity of the project site.

3.1.3 TOPOGRAPHY, SITE ACCESS, AND COMPETITION

The project site is characterised by sloping plains and low hills. The altitude ranges from 1 500m at the lowest point in the west, up to ~1 640m at the highest point in the central part of the site. High lying areas where wind resources are at their best are favoured during the site selection process for a wind energy facility, and the project site fits this criterion.

Access to the project site is ample with the presence of existing roads mainly consisting of national and regional roads. The project site is located to the south of the N12 national road, and to the east of the R500. The secondary roads off the N12 provide direct access to the project site and either option may be utilised to access the Project site during the life of the project.

There is minimal competition in the area, with regards to renewable energy facilities, specifically wind energy facilities; thus, the Project will likely be the one of the first few wind farms in the area and will act as one of the pioneering developments and open opportunities for other wind energy developments in the area.

3.1.4 LAND AVAILABILITY

In order to develop the proposed project with a contracted capacity of up to 100MW, sufficient space is required. The preferred project site was identified within the Gauteng Province, near the Fochville area, following the confirmation of a feasible wind resource from on-site wind measurements taken over a 16-month period. The properties included in the project site are privately – owned parcels available in the area for a development of this nature through agreement with landowners and are deemed technically feasible by the project developer for such development to take place. The combination of the affected properties has an extent of ~680ha, which was considered by the project developer as sufficient for the development of the project.

3.1.5 LAND USE AND SUITABILITY

The current land use of the Project site is an important consideration in site selection to limit disruption of existing land use parcels. There is some evidence of crop production within the western section of the site. It is important to note that a wind development, dissimilar to other power generation facilities, does not result in whole-scale disturbance. For example, Gouda Wind Farm, which is located outside the town of Gouda in the Western Cape province, has shown that it is possible to construct a wind farm in an agricultural area and that crop production can continue around the wind turbines while renewable energy is generated by the turbines.

3.1.6 LANDOWNER SUPPORT

The selection of a site where the landowner is supportive of the development of renewable energy is essential for ensuring the success of the project. The owner of the properties affected by the proposed Project does not view the development as a conflict with their current or planned land use practices. The support for the development to be undertaken on the affected properties has been solidified by the provision of consent for the project to proceed on the property through the signing of a consent form.

3.1.7 ENVIRONMENTAL CONSTRAINTS

Following confirmation of the Project site as being technically feasible for the development of a wind energy facility, the project developer commenced with desktop environmental screening of the site to identify the main constraints and determine whether there were any potential fatal flaws or significant no-go areas within the site that may compromise or limit the buildable area and the potential for generating up to 100MW. This is a common approach in the development of renewable energy projects in order to inform the placement of infrastructure for further investigation in the S&EIA process.

3.2 TECHNOLOGY ALTERNATIVES

3.2.1 RENEWABLE ENERGY TECHNOLOGY ALTERNATIVES

Through desktop screening, and monitoring wind resource using on-site monitoring devices over 16 months, the project developer has identified the site for the Igolide WEF as being competitive from a wind resource perspective. The project developer is therefore considering wind technology as a feasible option for implementation at the identified site based on the outcome of the onsite wind monitoring. There is a limited range of alternative technologies (turbines) available for commercial-scale wind energy facilities. Furthermore, the technology is constantly evolving. The project developer therefore confirms wind energy technology as the preferred technology alternative for the development of the project. No further renewable energy technology alternatives are considered in the S&EIA process.

3.2.2 BATTERY ENERGY STORAGE SYSTEM TECHNOLOGY ALTERNATIVES

The Proponent is considering two types of preferred battery technologies for the BESS, that is, either Solid State Lithium (SSL) or Vanadium Redox Flow (VRF) Battery Energy Storage Systems. It is important to note that the selection of specific technology will only be determined following EPC. Therefore, both technologies are currently being considered.

3.2.2.1 Lithium Solid State Batteries

Solid-State Battery consists of multiple battery cells that are assembled together to form modules. Each cell contains a positive electrode, a negative electrode and an electrolyte. The BESS will comprise multiple battery units or modules housed in shipping containers and/or an applicable housing structure which is delivered pre-assembled to the project site. Containers are usually raised slightly off the ground and layout out is rows. They can be stacked if required although this may increase the risk of events in one container spreading to another container. Supplementary infrastructure and equipment may include substations, power cables, transformers, power converters, substation buildings & offices, HV/MV switch gear, inverters and temperature control equipment that may be positioned between the battery containers. The solid-state batteries that are being considered are Lithium-ion systems.

In Lithium battery technologies, energy storage and release is provided by the movement of lithium ions from the negative electrode to the positive electrode during discharge and back when charging. Solid-State lithium (SSL) batteries have become increasing popular due to their high energy density, low self-discharge and long lifetime and cycling performances.

3.2.2.2 Vanadium redox Flow Battery

The project will employ utility scale batteries. These energy storage systems can be supplied either as containerized units or as a fixed installation within a building etc. Due to the proposed size of the facility (100MW) the Igolide WEF is currently envisioned as having units housed within a large battery building.

All electrochemical energy storage systems convert electrical energy into chemical energy when charging, and the process is reversed when discharging. With conventional batteries, the conversion and storage take place in closed cells. With redox flow batteries, however, the conversion and storage of energy are separated. Redox flow batteries differ from conventional batteries in that the energy storage material is conveyed by an energy converter. This requires the energy storage material to be in a flowable form. In redox flow batteries, charging and discharging processes can take place in the same cell. Redox flow batteries thus have the distinguishing feature that energy and power can be scaled separately. The power determines the cell size, or the number of cells and the energy is determined by the amount of the energy storage medium. In theory, there is no limit to the amount of energy that can be produced and/or stored thereby allowing for scalability of these systems. VRF battery is considered to have a large cycle life, independent power and energy ratings, relatively poor round trip, moderate cost and no self-discharge.

Figure 3-1 shows the general operating principle of redox flow batteries. The energy conversion takes place in an electrochemical cell which is divided into two half cells. The half cells are separated from each other by an ion-permeable membrane or separator, so that the liquids of the half cells mix as little as possible. The separator ensures a charge balance between positive and negative half cells, ideally without the negative and positive.

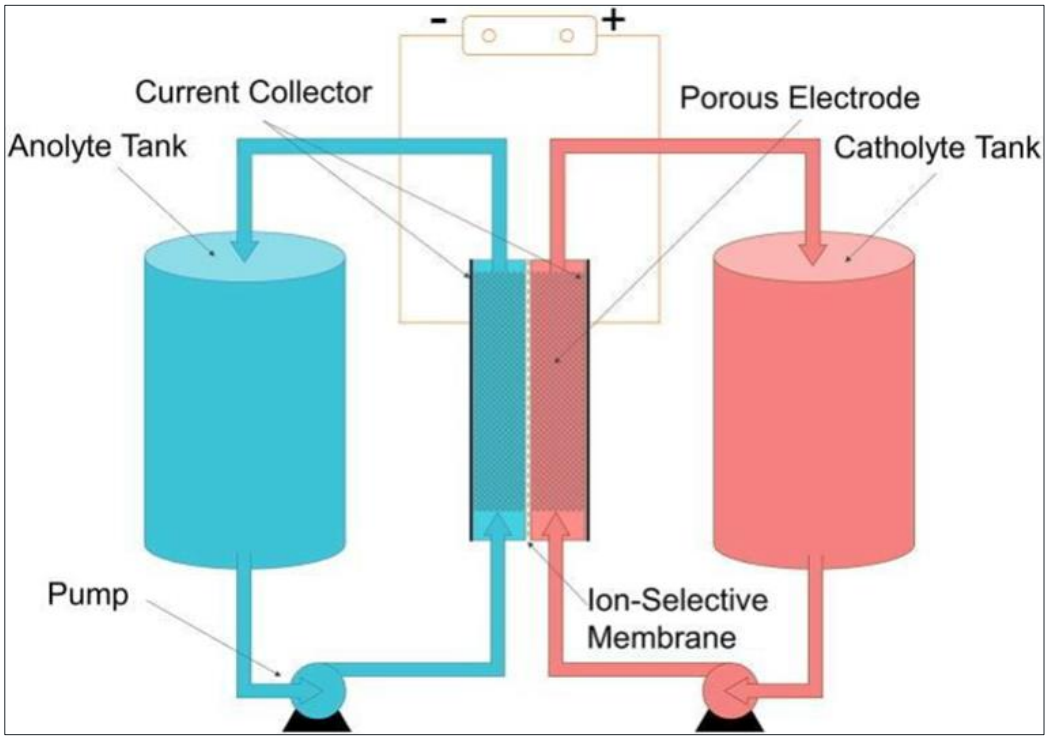

Figure 3-1 - Schematic Diagrams of Redox Flow BESS Systems (Source: Wikipedia)

3.3

3.4 NO-GO ALTERNATIVE

In the “no project” alternative, the Igolide WEF project will not be developed. In this scenario, there could be a missed opportunity to address the need for increase in renewable energy generation in an effort to mitigate against concerns of climate change and exploitation of non-renewable resources. The no-go alternative would not assist in responding to the growing electricity demand in South Africa and would not contribute to the reliability of electricity supply at a national scale. Conversely, negative environmental impacts of the project associated with the development of the proposed project would be avoided.

Specialists have considered the no-go alternative and the following has been concluded:

- Agriculture:
  The no-go alternative considers impacts that will occur to the agricultural environment in the absence of the proposed development. The development compliments agriculture by providing an additional income source, without excluding agriculture from the land, or decreasing production. Therefore, the negative agricultural impact of the no-go alternative is more significant than that of the development, and so, from an agricultural impact perspective, the proposed development is the preferred alternative. In addition, the no-go option would prevent the proposed development from contributing to the environmental, social and economic benefits associated with the development of renewable energy in South Africa.
- Traffic:
  The no-go alternative implies that the proposed development of the WEF does not proceed. This would mean that there will be no negative environmental impacts and no traffic impact on the surrounding network during the construction and decommissioning phases of the proposed WEF. However, this would also mean that there would be no socio-economic benefits to the surrounding communities, and it will not assist government in meeting its’ targets for renewable energy. Hence, the no-go alternative is not a preferred alternative.
- Social:
  The primary goal of the Project is to assist in providing additional capacity to Eskom to assist in addressing the current energy supply constraints. The project also aims to reduce the carbon footprint associated with energy generation. As indicated above, energy supply constraints and the associated load shedding have had a significant impact on the economic development of the South African economy. South Africa also relies on coal-powered energy to meet more than 90% of its energy needs. South Africa is therefore one of the highest per capita producers of carbon emissions in the world and Eskom, as an energy utility, has been identified as the world’s second largest producer carbon emissions.
- Heritage:
  If the project were not implemented then the site would stay as it currently is (impact significance of moderate negative). The heritage impacts with implementation would not be greater than the existing impacts, and the loss of potential socio-economic benefits would be of concern. This suggests that the No-Go option is less desirable in heritage terms.
- Palaeontological:
  There are no-go areas because the fossils, if present, can be removed and curated in a recognised institution such as a museum or university that has the facilities to store and research the fossil material.

- Visual:
  The ‘no-go’ alternative is the option of not undertaking the proposed project. Hence, if the ‘no-go’ option is implemented, there would be no development. The area would thus retain its visual character and sense of place and no visual impacts would be experienced by any locally occurring receptors.

The No-Development option would represent a lost opportunity for South Africa to improve energy security and supplement is current energy needs with clean, renewable energy. Given South Africa’s current energy security challenges and its position as one of the highest per capita producers of carbon emissions in the world, this would represent a significant negative social cost.

4 ENVIRONMENTAL SENSITIVITY

4.1 SENSITIVITY MAPPING

A consolidated environmental sensitivity map has been compiled based on the sensitivities and buffers outlined in the following specialist studies:

- Aquatic Biodiversity;
- Terrestrial Biodiversity;
- Heritage;
- Avifauna;
- Bats; and
- Visual.

The location of the project infrastructure (i.e., layout) was determined based on initial environmental and technical screening which considered the infrastructure locations feasible from a constructability perspective. This included several key aspects including environmental constraints and opportunities, distance to grid connection, topography, and site accessibility.

The conceptual layout (12 turbines) was assessed by the various Specialists during the Scoping Phase.

Based on sensitivities identified by specialists during the Scoping Phase, the project layout was optimised for the EIA phase. The conceptual layout was optimised based on the following:

- The optimised layout reduced the number of turbines from 12 to 10.
- The infrastructure was repositioned based on the following specialist constraints:
  - Bats – to ensure that blades do not infringe into the no-go areas;
  - Noise - to ensure there are no turbines within 500m from NSRs;
  - Heritage - to ensure that the turbines and roads avoid heritage features; and
  - Terrestrial - to move turbines away from CBAs
- Repositioning of the IPP substation (500m buffer) to ensure the infrastructure to the north-west portion of the site as seen in the final layout (**Figure 4-1**).

During the course of the EIA phase, the optimised layout was finalised based on the specialist inputs. These inputs included the following recommendations:

- Terrestrial Biodiversity:
  - Relocation of Turbine 04 such it falls outside of the NPAES area.
- Heritage:
  - The project road past the graveyard at Site 23 should be shifted north to allow a 30 m no-go buffer around the graveyard;
  - The project road passing through the Late Iron Age site at Site 05 should be rerouted towards the south. It is recognised that the project site boundary provides a constraint in terms of buffer width (30 m would be ideal) and the road should thus be placed as far south as possible;
  - Turbines 1, 3 and 5 and their associated roads should be shifted to the north to allow a 30 m no-go buffer between them and the Late Iron Age and historical Sites 01, 02 and 16;

- The project infrastructure at Turbine 7 must be placed far enough east to allow a 30 m no-go buffer around the Late Iron Age Site 07; and
- The project road passing the north-eastern part of Late Iron Age Site 08 should be shifted towards the northeast to allow a 30 m no-go buffer between it and the site.

- Social:
  - The developers should liaise with the owners of the property to identify an alternative location for the substation and BESS. The owners have proposed an area on the northernmost site property, Leeuwpoort 356/65.

Figure 4-1 shows the environmental sensitivity features overlain with the Final layout.

Table 4-1 - Mapping criteria utilised by the specialists for the assessment

No-Go	Areas or features that are considered of such sensitivity or importance that any adverse effects upon them may be regarded as a fatal flaw.
High	Areas or features that are considered to have high sensitivity. Development in these areas must be limited and must remain within any acceptable limits of change as determined by the specialist. Development should also comply with any other restrictions or mitigation measures identified by the specialist.
Medium	Medium sensitivity areas are considered to be developable; however, the nature of the effects should remain within any acceptable limits of change as determined by the specialist. Development should also comply with any other restrictions or mitigation measures identified by the specialist.
Low	Low sensitivity areas that are considered to be developable however specialists may still wish to define acceptable limits of change should they deem this necessary.

NO-GO AREA

Legislated “no go” areas or setbacks are areas or features that are considered of such significance that impacting them may be regarded as fatal flaw or strongly influence the project impact significance profile. Therefore, areas or features that are considered to have a high sensitivity or where project infrastructure would be highly constrained and should be avoided as far as possible are referred to as “no-go” areas. Infrastructure located in these areas are likely to drive up impact significance ratings and mitigations. The assumption is that the overhead lines could span these areas, but the towers/pylons should adhere to the buffer distances as indicated as far as possible where areas are too large to span (buffers) then these tower positions must be evaluated on a case by case basis prior to construction.

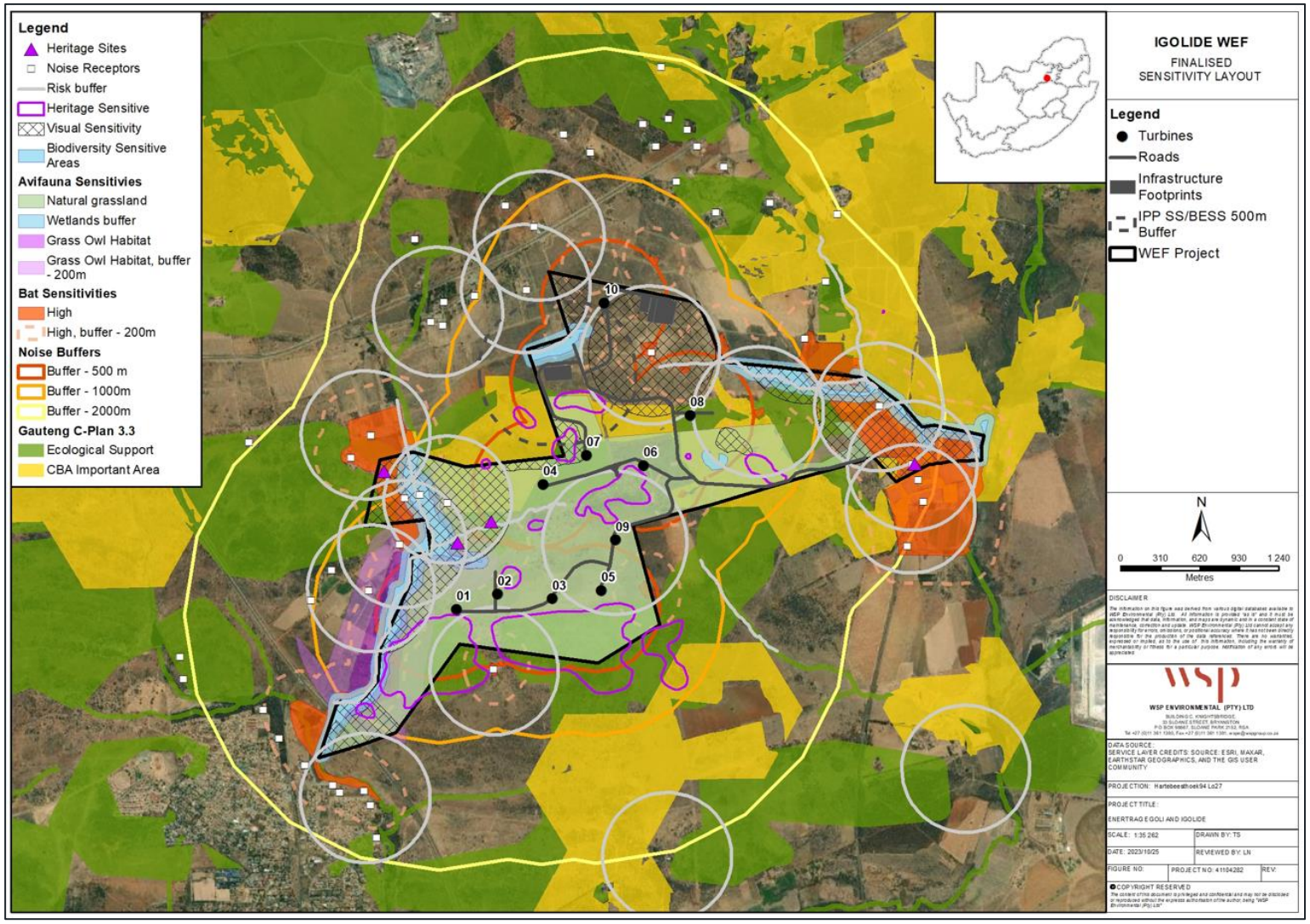

Figure 4-1 –Sensitivity Map for the Final Layout

4.2 IMPACT ASSESSMENT OUTCOMES

A summary of the identified impacts and corresponding significance ratings for the proposed project is provided in **Table 4-2** below.

Table 4-2 – Impact Summary

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
Aquatic Biodiversity	River water quality modifications	C	(-)	Very Low	Very Low
	Increased sediment load and loss of habitat	C	(-)	Very Low	Very Low
	Increased river flows altering the natural flow regime	C	(-)	Low	Very Low
	Loss of indigenous species and reduced availability of water	C	(-)	Low	Very Low
	Increased sediment load and loss of habitat	O	(-)	Low	Very Low
	Increased river flows altering the natural flow regime	O	(-)	Low	Very Low
	Loss of indigenous species and reduced availability of water	O	(-)	Low	Very Low
Wetland Aquatic Biodiversity	Loss of Wetland Habitat	C	(-)	Moderate	Low
	Changes in wetland health/functioning	C	(-)	Moderate	Low
	Contamination of watercourses:	C	(-)	Moderate	Very Low
	Soil Erosion	C	(-)	Moderate	Low
	Establishment and spread of alien invasive species	C	(-)	Moderate	Very Low
	Spread of alien invasive species	O	(-)	Moderate	Very Low
	soil erosion	O	(-)	Moderate	Low
	spread of alien invasive species	D	(-)	Moderate	Very Low
Terrestrial Biodiversity	Loss of vegetation/habitat	C	(-)	Moderate	Low
	loss of threatened, SCC, protected & endemic plant species	C	(-)	Low	Very low

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	Loss of faunal habitat	C	(-)	Moderate	Low
	faunal mortalities	C	(-)	Low	Low
	Increased dust deposition	C	(-)	Low	Very low
	Increased human activity, noise and light levels	C	(-)	Low	Very low
	Impacts of roads	C	(-)	Moderate	Low
	Establishment of alien vegetation	C	(-)	Moderate	Low
	Increased water run-off and erosion	C	(-)	Moderate	Low
	Changes in animal behaviour	C	(-)	Low	Very low
	Direct faunal mortalities	O	(-)	Moderate	Low
	light and noise levels	O	(-)	Moderate	Low
	Establishment of alien vegetation	O	(-)	Moderate	Low
	Increased water run-off and erosion	O	(-)	Moderate	Low
	faunal mortalities	D	(-)	Low	Very low
	Increased dust deposition	D	(-)	Low	Very low
	Establishment of alien vegetation	D	(-)	Moderate	Very low
	Increased water run-off and erosion	D	(-)	Moderate	Low
Plant Species	Loss of vegetation/ habitat	C	(-)	Moderate	Moderate
	The potential loss of threatened, SCC, protected & endemic plant species	C	(-)	Low	Very Low
	Increased dust deposition	C	(-)	Low	Very Low
	Establishment of alien vegetation	C	(-)	Moderate	Low
	Increased water run-off and erosion	C	(-)	Moderate	Low

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	Establishment of alien vegetation	O	(-)	Moderate	Low
	Increased dust deposition	D	(-)	Low	Very Low
Animal Species habitat and diversity	Loss of faunal habitat	C	(-)	Moderate	Low
	Direct faunal mortalities due to construction and increased traffic	C	(-)	Low	Very Low
	Increased dust deposition	C	(-)	Low	Very Low
	Increased human activity, noise and light levels.	C	(-)	Low	Very Low
	Impacts of roads	C	(-)	Moderate	Low
	Changes in animal behaviour	C	(-)	Low	Very Low
	Direct faunal mortalities	O	(-)	Moderate	Low
	Increased light and noise levels and changes in animal behaviour.	O	(-)	Moderate	Low
	Faunal mortalities	D	(-)	Low	Very Low
	Increased dust deposition	D	(-)	Low	Very Low
Avifauna	Displacement of priority species	C	(-)	Moderate	Low
	Displacement of priority species	O	(-)	Moderate	Low
	Mortality of priority species	O	(-)	Moderate	Low
	Electrocution of priority species	O	(-)	Moderate	Low
	Collisions of priority species	O	(-)	Moderate	Low
	Noise pollution	D	(-)	Moderate	Low
Archaeological and Cultural Heritage	Archaeological resources	C	(-)	Moderate	Low
	Graves	C	(-)	Moderate	Low
	Cultural landscape	C	(-)	Moderate	Moderate
	Cultural landscape	O	(-)	Moderate	Moderate
	Cultural landscape	D	(-)	Moderate	Moderate

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
Palaeontology	Palaeontological resources	C	(-)	Low	Very low
Traffic	Increase in Development Trips	C	(-)	Moderate	Low
	Noise and dust pollution	O	(-)	Low	Very Low
	Increase in Development Trips	D	(-)	Moderate	Low
Visual	Visual Impacts	C	(-)	Moderate	Low
	Visual Impacts	O	(-)	Moderate	Moderate
	Visual Impacts	D	(-)	Moderate	Low
Social	Creation of employment and business opportunities	C	(+)	Low	Moderate
	Presence of construction workers in the area on local communities	C	(-)	Moderate	Low
	Influx of job seekers	C	(-)	Low	Low
	Risk to safety, livestock, and damage to farm infrastructure	C	(-)	Low	Low
	Increased risk of grass fires	C	(-)	Moderate	Very Low
	Construction related activities	C	(-)	Moderate	Low
	Loss of farmland	C	(-)	Moderate	Low
	Improving energy security and support renewable sector	O	(+)	Moderate	High
	Creation of employment opportunities	O	(+)	Very Low	Moderate
	Benefits associated with socio-economic development contributions	O	(+)	Low	Moderate
	Visual impact and impact on sense of place	O	(-)	Moderate	Moderate
	Impact on property values	O	(-)	Low	Very Low
	Tourism	O	(-)	Very Low	Very Low
	Social impacts associated with decommissioning	D	(-)	Low	Very Low

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
Geotechnical	Soil erosion	C	(-)	Moderate	Very low
	Oil spillages	C	(-)	Moderate	Very low
	Disturbance of fauna and flora	C	(-)	Low	Very low
	Slope stability	C	(-)	Low	Very low
	Seismic activity	C	(-)	Very Low	Very low
	Soil Erosion	O	(-)	Low	Very low
	Potential Oil Spillages	O	(-)	Moderate	Very low
	Soil erosion	D	(-)	Moderate	Very low
	Oil spillages	D	(-)	Moderate	Very low
	Disturbance of fauna and flora	D	(-)	Low	Very low
	Slope stability	D	(-)	Low	Very low
High Level Safety, Health and Environmental Risk Assessment	Human Health - chronic exposure to toxic chemical or biological agents	C	(-)	Moderate	Low
	Human Health - exposure to noise	C	(-)	Moderate	Low
	Human Health - exposure to temperature extremes and/or humidity	C	(-)	Low	Very Low
	Human Health - exposure to psychological stress	C	(-)	Low	Low
	Human Health - exposure to ergonomic stress	C	(-)	Low	Low
	Human and Equipment Safety - exposure to fire radiation	C	(-)	Moderate	Low
	Human Health - chronic exposure to toxic chemical or biological agents	C	(-)	Moderate	Low
	Human and Equipment Safety - exposure to explosion over pressures	C	(-)	Moderate	Low
	Human and Equipment Safety - exposure to acute toxic	C	(-)	Moderate	Low

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	chemical and biological agents				
	Human and Equipment Safety - exposure to acute toxic chemical and biological agents	C	(-)	Moderate	Low
	Human and Equipment Safety - exposure to violent release of kinetic or potential energy	C	(-)	Moderate	Low
	Human and Equipment Safety - exposure to electromagnetic waves	C	(-)	Moderate	Low
	Environment - emissions to air	C	(-)	Low	Very Low
	Environment - emissions to water	C	(-)	Low	Low
	Environment - emissions to earth	C	(-)	Low	Low
	Environment - waste of resources e.g., water, power etc	C	(-)	Low	Very Low
	Public - Aesthetics	C	(-)	Low	Low
	Investors - Financial	C	(-)	Moderate	Low
	Employees and investors - Security	C	(-)	Moderate	Low
	Emergencies	C	(-)	Moderate	Low
	Investors - Legal	C	(-)	Moderate	Low
	Human Health - chronic exposure to toxic chemical or biological agents	O	(-)	Moderate	Low
	Human Health - chronic exposure to toxic chemical or biological agents	O	(-)	Moderate	Low
	Human Health - exposure to noise	O	(-)	Moderate	Low
	Human Health - exposure to temperature extremes and/or humidity	O	(-)	Low	Very Low

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	Human Health - exposure to psychological stress	O	(-)	Low	Very Low
	Human Health - exposure to ergonomic stress	O	(-)	Moderate	Low
	Human and Equipment Safety - exposure to fire radiation	O	(-)	High	Low
	Human and Equipment Safety - exposure to fire radiation	O	(-)	High	Low
	Human and Equipment Safety - exposure to explosion over pressures	O	(-)	Moderate	Low
	Human and Equipment Safety - exposure to acute toxic chemical and biological agents	O	(-)	Low	Low
	Human and Equipment Safety - exposure to acute toxic chemical and biological agents	O	(-)	Moderate	Low
	Human and Equipment Safety - exposure to violent release of kinetic or potential energy	O	(-)	Moderate	Low
	Human and Equipment Safety - exposure to electromagnetic waves	O	(-)	Moderate	Low
	Environment - emissions to air	O	(-)	Low	Very Low
	Environment - emissions to water	O	(-)	Low	Low
	Environment - emissions to earth	O	(-)	Low	Very Low
	Environment - waste of resources e.g., water, power etc	O	(-)	Low	Very Low
	Public - Aesthetics	O	(-)	Low	Low
	Investors - Financial	O	(-)	Moderate	Low
	Employees and investors - Security	O	(-)	Moderate	Low
	Employees and investors - Security	O	(-)	Moderate	Low

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	Emergencies	O	(-)	Moderate	Low
	Investors - Legal	O	(-)	Moderate	Low
	Human Health - chronic exposure to toxic chemical or biological agents	D	(-)	N/A	N/A
	Human Health - exposure to noise	D	(-)	N/A	N/A
	Human Health - exposure to temperature extremes and/or humidity	D	(-)	N/A	N/A
	Human Health - exposure to psychological stress	D	(-)	N/A	N/A
	Human Health - exposure to ergonomic stress	D	(-)	N/A	N/A
	Human and Equipment Safety - exposure to fire radiation	D	(-)	N/A	N/A
	Human and Equipment Safety - exposure to explosion over pressures	D	(-)	N/A	N/A
	Human and Equipment Safety - exposure to acute toxic chemical and biological agents	D	(-)	N/A	N/A
	Human and Equipment Safety - exposure to violent release of kinetic or potential energy	D	(-)	N/A	N/A
	Human and Equipment Safety - exposure to electromagnetic waves	D	(-)	N/A	N/A
	Environment - emissions to air	D	(-)	N/A	N/A
	Environment - emissions to water	D	(-)	N/A	N/A
	Environment - emissions to earth	D	(-)	Moderate	Low
	Environment - waste of resources e.g., water, power etc	D	(-)	N/A	N/A

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	Public - Aesthetics	D	(-)	N/A	N/A
	Investors - Financial	D	(-)	N/A	N/A
	Employees and investors - Security	D	(-)	N/A	N/A
	Emergencies	D	(-)	N/A	N/A
	Investors - Legal	D	(-)	Moderate	Low
Noise	Construction of access roads	C	(-)	Very Low	Very Low
	Construction traffic noises	C	(-)	Very Low	Very Low
	Daytime WTG construction activities	C	(-)	Very Low	Very Low
	Night-time WTG construction activities	C	(-)	Moderate	Low
	Daytime operation of selected WTG	O	(-)	Low	Low
	Night-time operation of selected WTG	O	(-)	Moderate	Low
Bats	Loss of foraging habitat	C	(-)	Low	Low
	Roost destruction during earthworks	C	(-)	Low	Very Low
	Bat mortalities	O	(-)	High	Moderate
	Bat mortalities during migration	O	(-)	High	Moderate
	Increased bat mortalities due to light attraction	O	(-)	High	Low

4.3 APPLICABLE DOCUMENTATION

The following documents are to be read in conjunction with the EMPr:

- EIR for the Proposed Igolide Wind Energy Facility;
- Generic EMPR for the development and expansion of substation infrastructure for the transmission and distribution of electricity;
- Generic EMPR for the development and expansion for overhead electricity transmission and distribution infrastructure; and
- Should the project be authorised, the EA issued by the DFFE in terms of the NEMA.

5 GOVERNANCE FRAMEWORK

5.1 NATIONAL LEGAL AND REGULATORY FRAMEWORK

The South African regulatory framework establishes well-defined requirements and standards for environmental and social management of industrial and civil infrastructure developments. Different authorities at both national and regional levels carry out environmental protection functions. The applicable legislation and policies are shown in **Table 5-1**.

Table 5-1 – Applicable National Legislation

Legislation	Description of Legislation and Applicability
The Constitution of South Africa (No. 108 of 1996)	The Constitution cannot manage environmental resources as a stand-alone piece of legislation hence additional legislation has been promulgated in order to manage the various spheres of both the social and natural environment. Each promulgated Act and associated Regulations are designed to focus on various industries or components of the environment to ensure that the objectives of the Constitution are effectively implemented and upheld in an on-going basis throughout the country. In terms of Section 7, a positive obligation is placed on the State to give effect to the environmental rights.
National Environmental Management Act (No. 107 of 1998)	In terms of Section 24(2) of the NEMA, the Minister may identify activities, which may not commence without prior authorisation. The Minister thus published GNR 983 (as amended) (Listing Notice 1), GNR 984 (as amended) (Listing Notice 2) and GNR 985 (as amended) (Listing Notice 3) listing activities that may not commence prior to authorisation. The regulations outlining the procedures required for authorisation are published in the EIA Regulations of 2014 (GNR 982) (as amended). Listing Notice 1 identifies activities that require a BA process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 2 identifies activities that require an S&EIR process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 3 identifies activities within specific areas that require a BA process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. WSP undertook a legal review of the listed activities according to the proposed project description to conclude that the activities listed in in this section are considered applicable to the development: A S&EIR is being followed. An EA is required and has been applied for with the DFFE.
Listing Notice 1: GNR 983	**Activity 11(i)** *The development of facilities or infrastructure for the transmission and distribution of electricity—* *(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts* *excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is —* *(a) temporarily required to allow for maintenance of existing infrastructure;*

Legislation	Description of Legislation and Applicability
	(b) 2 kilometres or shorter in length; *(c)within an existing transmission line servitude; and* *(d) will be removed within 18 months of the commencement of development.* **Description:** Internal distribution electrical infrastructure required to connect the facility to the grid will include a 33/132kV on-site IPP substation and 33kV cabling (buried or overhead). The Facility is located outside urban areas. Exclusions: In addition, the development of the activity does not trigger any of the exclusions as outlined below: (a) The proposed project will not be temporary to allow for maintenance. (b) The proposed infrastructure will be more than 2km in length. (c) The proposed infrastructure is not within an existing transmission line servitude. (d) The proposed infrastructure will not be removed within 18 months and is not considered temporary.
	Activity 12(ii)(a)(c) *The development of—* *(ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs—* *(a) within a watercourse; or* *(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.* *excluding—* *(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;* *(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;* **Description:** The physical footprint of internal access roads and electrical cabling required to connect the various components of the facility will exceed 100m^2 within delineated watercourses on site, or within 32m of the outer extent of the delineated watercourses on site. The footprint of the infrastructure within the watercourse and 32m of the outer extent of the delineated watercourse will be approximately 5 000 m^2 (0.5 ha). Exclusions: In addition, the development of the activity does not trigger any of the exclusions as outlined below: (aa) the development of infrastructure or structures will not occur within existing ports or harbours. Therefore, will not increase the development footprint of the port or harbour;

Legislation	Description of Legislation and Applicability
	(bb) The development activities for the proposed project are not related to the development of a port or harbour, therefore, case activity 26 in Listing Notice 2 of 2014 is not applicable.
	Activity 14 *The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 80 but not exceeding 500 cubic metres* **Description:** The facility will require the storage and handling of dangerous goods, including fuel, cement, and combustible and flammable liquids such as oils, lubricants and solvents, where such storage will occur inside containers with a combined capacity greater than 80m^3 but not exceeding 500m^3. The following estimated maximum capacities of dangerous good will be stored on site: ▪ Concrete Batching: ~145 m^3 ▪ Fuel stores (Petrol and/or Diesel): ~250m^3 ▪ Paint, grease, transformer oils, construction chemicals, lubricants: ~100m^3
	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 a watercourse.* *but excluding where such infilling, depositing, dredging, excavation, removal or moving—* *(a) will occur behind a development setback;* *(b) is for maintenance purposes undertaken in accordance with a maintenance management plan [or]* *(c)falls within the ambit of activity 21 in this Notice, in which case that activity applies;* *(d)occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or* *(e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.* **Description:** Internal access roads and stormwater control infrastructure, as well as electrical cabling required to connect the various components of the facility will collectively require the excavation, infilling or removal of soil exceeding 10m^3 from delineated watercourses on site. The footprint of the infrastructure within the watercourse and 32m of the outer extent of the delineated watercourse will be approximately 5 000 m^2 (0.5 ha).. <u>Exclusions:</u> In addition, the development of the activity does not trigger any of the

Legislation	Description of Legislation and Applicability
	exclusions as outlined below: (a) The project will not occur behind a development setback; (b) The project is not intended for maintenance purposes undertaken in accordance with a maintenance management plan; (c) The project does not fall within the ambit of activity 21 in this Notice and therefore, activity 19 of LN 1 applies; (d) the project does not occur within existing ports or harbours, therefore, it will not increase the development footprint of the port or harbour; or (e) The project development is not related to the development of a port or harbour, therefore, activity 26 in Listing Notice 2 of 2014 does not apply..
	Activity 24(ii) *The development of a road—* *(ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;* *but excluding a road—* *(a) which is identified and included in activity 27 in Listing Notice 2 of 2014;* *(b) where the entire road falls within an urban area; or* *(c) which is 1 kilometre or shorter.* **Description:** Internal access roads required by the facility will be between 8m and 10m wide. Where required for turning circle/bypass areas, however, access or internal roads may be up to 20m to allow for larger component transport. The access and internal roads will be placed within a corridor of up to 20m width to accommodate cable trenches, stormwater channels and turning circle/bypass areas of up to 20m. Exclusions: In addition, the development of the activity does not trigger any of the exclusions as outlined below: (a) The proposed road infrastructure does not trigger activity 27 in Listing Notice 2 of 2014. (b) The proposed road infrastructure will fall outside an urban area. (c) The proposed road will be more than 1 kilometre in length.
	Activity 28(ii) *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 ha.*

Legislation	Description of Legislation and Applicability
	Excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes. **Description:** The facility is considered a commercial and/or industrial development and is located on several farm portions outside an urban area, used for agricultural and game farming purposes. The total area to be developed for the facility (footprint) is approximately 64ha. . Exclusions: In addition, the development of the activity does not trigger any of the exclusions as the land has not been developed for residential, mixed, retail, commercial, industrial or institutional purposes.
	Activity 48(i)(a)(c) *The expansion of—* *(i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more;* *where such expansion occurs—* *(a) within a watercourse;* *(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.* *excluding—* *(aa) the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;* *(bb) where such expansion activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;* *(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;* *(dd) where such expansion occurs within an urban area; or* *(ee) where such expansion occurs within existing roads, road reserves or railway line reserves.* **Description:** Transport of large infrastructure components related to the facility will require the expansion of existing access and/or internal roads, culverts or similar drainage crossing infrastructure collectively exceeding 100m^2 or more beyond existing roads or road reserves located within delineated watercourses on site, or within 32m of the outer extent of the delineated watercourses on site. The footprint of the infrastructure within the watercourse and 32m of the outer extent of the delineated watercourse will be approximately 5 000 m^2 (0.5 ha). Exclusions: In addition, the development of the activity does not trigger any of the exclusions as outlined below: (aa) The proposed infrastructure does not relate to the expansion of infrastructure or structures within existing ports or harbours and will not

Legislation	Description of Legislation and Applicability
	increase the development footprint of the port or harbour; (bb) The proposed infrastructure does not relate to the development of a port or harbour. Therefore activity 26 in Listing Notice 2 of 2014 does not apply; (cc) Activities listed in activity 14 in Listing Notice 2 of 2014 does not apply. However, both activity 12 of LN 1 and activity 14 in LN 3 are applicable as they address different aspects. Activity 12 of LN 1 addresses the footprint of the disturbance, whilst activity 14 of LN 3 addresses the geographical aspect of the proposed development and its location within a protected area. (dd) Does not occur within an urban area; (ee) does not occur within existing roads, road reserves or railway line reserves.
	Activity 56(ii) *The widening of a road by more than 6 m, or lengthening of a road by more than 1 km –* *(ii) where no reserve exists, where the existing road is wider than 8 metres.* *Excluding where widening or lengthening occur inside urban areas.* **Description:** Transport of large infrastructure components related to the facility will require the widening of existing access and/or internal roads by more than 6m and the lengthening of existing access and/or internal roads by more than 1km, where no reserve exists and where such road is wider than 8 metres. The facility is located within a rural area. Subject to detail design widening up to 20m for turning circle/bypass areas is anticipated, thereby exceeding the threshold value and triggering this activity. <u>Exclusions:</u> In addition, the development of the activity does not trigger any of the exclusions as the proposed road will be developed outside an urban area.
Listing Notice 2: GNR 984	**Activity 1** *The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs:* *(a) within an urban area; or* *(b) on existing infrastructure.* **Description:** The project comprises a Wind Energy Facility of up to 100MW. <u>Exclusions:</u> In addition, the development of the activity does not trigger any of the exclusions as the proposed facility will be developed outside an urban area and will not be on existing infrastructure.

Legislation	Description of Legislation and Applicability
	Activity 15 *The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for—* *(i) the undertaking of a linear activity; or* *(ii) maintenance purposes undertaken in accordance with a maintenance management plan* **Description:** The facility will require the clearance of indigenous vegetation of ~ 64ha. Exclusions: In addition, the development of the electrical infrastructure does not trigger any of the exclusions as the clearance of indigenous vegetation is not for a linear activity and is not for maintenance purposes.
Listing Notice 3: GNR 985	**Activity 4(c)(iv)** *The development of a road wider than 4 metres with a reserve less than 13,5 metres—* *c)Gauteng:* *ii. National Protected Area Expansion Strategy Focus Areas;* *iv. Sites identified as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;* *vii. Sites identified as high potential agricultural land in terms of Gauteng Agricultural Potential Atlas;.* **Description:** Internal access roads required for the facility will be between 8m and 10m wide, increasing up to 20m where required for turning circle/bypass areas. The exact values will be confirmed following detailed design. The proposed roads required for the facility will be located within and may require vegetation clearance or disturbance within Critical Biodiversity Areas (CBA) and Ecological Support Areas (ESA) The site falls within an area that is classified as a Protected Agricultural Area in the Gauteng Province. The study site is part of the NPAES (NPAES 2018). Although none of the turbines are located within the NPAES, linear infrastructure such a roads and underground cables will traverse the NPAES.
	Activity 10(c)(iv): *The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80cubic metres.* *c. Gauteng:* *ii. National Protected Area Expansion Strategy Focus Areas;* *iv. Sites identified as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional*

Legislation	Description of Legislation and Applicability
	plans; *vii. Sites identified as high potential agricultural land in terms of Gauteng Agricultural Potential Atlas* **Description:** The facility will require the storage and handling of dangerous goods, including fuel, cement, and combustible and flammable liquids such as oils, lubricants and solvents, where such storage will occur inside containers with a combined capacity greater than 80m^3 but not exceeding 500m^3(c)(iv). The proposed roads required for the facility will be located within and may require vegetation clearance or disturbance within Critical Biodiversity Areas (CBA) and Ecological Support Areas (ESA) The site falls within an area that is classified as a Protected Agricultural Area in the Gauteng Province. The study site is part of the NPAES (NPAES 2018). Although none of the turbines are located within the NPAES, linear infrastructure such a roads and underground cables will traverse the NPAES.
	Activity 12: *The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan—* *c) Gauteng:* *ii. Within Critical Biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans.* **Description:** The facility will require the clearance of more than 300m^2 of indigenous vegetation, which will partially include the clearance of Rand Highveld Grassland and Gauteng Shale Mountain Bushveld vegetation types, which are classified as “Vulnerable” and “Least Concern”, respectively (NEMA 2011, Skowno et al., 2019) in the Gauteng Province. The facility will require the clearance of indigenous vegetation of ~ 64ha some of which will be located within Critical Biodiversity Areas (CBA) and Ecological Support Areas (ESA).
	Activity 14(ii)(a)(c)(iv) *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;* *(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;* *Excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or*

Legislation	Description of Legislation and Applicability
	harbour. *c) Gauteng:* *ii. National Protected Area Expansion Strategy Focus Areas* *iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans.* **Description:** The facility will require the development of internal roads and/or access roads, culverts or similar drainage crossing infrastructure around the site with a physical footprint exceeding 10m^2 within the delineated watercourses on site or within 32m of the outer extent of the delineated watercourses on site. The footprint of the infrastructure within the watercourse and 32m of the outer extent of the delineated watercourse will be approximately 5 000 m^2 (0.5 ha).In addition, the roads associated with the facility will be located within Critical Biodiversity Areas (CBA) and Ecological Support Areas (ESA) within the Gauteng Province. The study site is part of the NPAES (NPAES 2018). Although none of the turbines are located within the NPAES, linear infrastructure such a roads and underground cables will traverse the NPAES.
	Activity 18(c)(iv) *The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.* *c) Gauteng:* *ii. National Protected Area Expansion Strategy Focus Areas;* *iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;* *vii. Sites identified as high potential agricultural land in terms of Gauteng Agricultural Potential Atlas;* **Description:** Transport of large infrastructure components related to the facility will require the widening of existing access and/or internal roads by more than 4m, and the lengthening of existing access and/or internal roads by more than 1km. The facility is located within a rural area. The facility will be located within Critical Biodiversity Areas (CBA) and Ecological Support Areas (ESA)(iv) in the Gauteng Province. The site falls within an area that is classified as a Protected Agricultural Area in the Gauteng Province. The study site is part of the NPAES (NPAES 2018). Although none of the turbines are located within the NPAES, linear infrastructure such a roads and underground cables will traverse the NPAES
	Activity 23(ii)(a)(c)(iv) *The expansion of* *(ii) infrastructure or structures where the physical footprint is expanded by 10 square metres or more;* *Where such expansion occurs-*

Legislation	Description of Legislation and Applicability
	(a) within a watercourse *Excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.* *c) Gauteng:* *ii. National Protected Area Expansion Strategy Focus Areas;* *iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;* **Description:** Transport of large infrastructure components related to the facility will require the expansion of existing access and/or internal roads, culverts or similar drainage crossing infrastructure collectively exceeding 10m^2 or more within delineated watercourses on site, or within 32m of the outer extent of the delineated watercourses on site. The exact values will be confirmed at detailed design, however, these will be within the thresholds relevant to this Listed Activity and therefore within the threshold values and triggering this activity. In addition, the development activity contemplated will be located within Critical Biodiversity Areas (CBA) and Ecological Support Areas (ESA) in the Gauteng Province. The study site is part of the NPAES (NPAES 2018). Although none of the turbines are located within the NPAES, linear infrastructure such a roads and underground cables will traverse the NPAES
Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes (GNR 320, 20 March 2020 and GNR 1150, 30 October 2020)	The protocols provide the criteria for specialist assessment and minimum report content requirements for impacts for various environmental themes for activities requiring environmental authorisation. The protocols replace the requirements of Appendix 6 of the EIA Regulations, 2014, as amended. The assessment and reporting requirements of the protocols are associated with a level of environmental sensitivity identified by the national web based environmental screening tool (screening tool). The following environmental themes were applicable to the Igolide WEF project: ▪ Agriculture Theme ▪ Animal Species Theme ▪ Aquatic Biodiversity Theme ▪ Archaeological and Cultural Heritage Theme ▪ Avian Theme ▪ Civil Aviation (Wind) Theme ▪ Defence Theme ▪ Landscape (Wind) Theme ▪ Palaeontology Theme ▪ Plant Species Theme ▪ Radio Frequency Interference (RFI) Theme ▪ Terrestrial Biodiversity Theme
Renewable Energy Development Zones and Strategic Transmission Corridors	On 16 February 2018, the DFFE gazetted the Renewable Energy Development Zones (REDZs) 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).

Legislation	Description of Legislation and Applicability
	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 development within the five power corridors to be subjected to a BA and not a full S&EIA process. In addition, the timeframes associated with the decision on the application is reduced from 107 days to 57 days. **The proposed Igolide WEF is not located within a REDZ.**
National Environmental Management: Waste Act (59 of 2008) (NEM:WA)	This Act provides for regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation. The Act also provides for the licensing and control of waste management activities through GNR. 921 (2013): List of Waste Management Activities that Have, or are Likely to Have, a Detrimental Effect on the Environment. The proposed project does not constitute a Listed Activity requiring a Waste Management Licence (WML) as defined in GNR 921. However, the contents of the EIR include reasonable measures for the prevention of pollution and good international industry practice (GIIP).
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) was promulgated in June 2004 within the framework of NEMA to provide for the management and conservation of national biodiversity. The NEMBA's primary aims are for the protection of species and ecosystems that warrant national protection, the sustainable use of indigenous biological resources, the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources. In addition, the NEMBA provides for the establishment and functions of a South African National Biodiversity Institute (SANBI). SANBI was established by the NEMBA with the primary purpose of reporting on the status of the country's biodiversity and conservation status of all listed threatened or protected species and ecosystems. The terrestrial biodiversity assessment identified that the Facility overlaps with Critical Biodiversity Areas (CBA) and Ecological Support Areas (ESA). The Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA) Regulations with regards to alien and invasive species have been superseded by the National Environmental Management: Biodiversity Act, 2004 (Act no. 10 of 2004) – Alien and Invasive Species (AIS) Regulations which became law on 1 October 2014. Specific management measures for the control of alien and invasive plants are included in this Environmental Management Programme (EMPr).
National Environmental Management Protected Areas Act (No. 57 of 2003)	The purpose of the National Environmental Management Protected Areas Act (No. 57 of 2003) (NEMPAA) is to, *inter alia*, provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. To this end, it provides for the declaration and management of various types of protected areas. Section 50(5) of NEMPAA states that "no development, construction or farming may be permitted in a nature reserve or world heritage site without

Legislation	Description of Legislation and Applicability
	the prior written approval of the management authority." According to the National Protected Area Expansion Strategy (NPAES, 2018), the study site is part of the NPAES (NPAES 2018). None of the turbines are located in the areas demarcated by the NPAES.
The National Water Act (No. 36 Of 1998)	The National Water Act, 1998 (Act No. 36 of 1998) (NWA) provides the framework to protect water resources against over exploitation and to ensure that there is water for social and economic development, human needs and to meet the needs of the aquatic environment. The Act defines water source to include watercourses, surface water, estuary or aquifer. A watercourse is defined in the Act as a river or spring, a natural channel in which water flows regularly or intermittently, a wetland, lake or dam into which or from which water flows, and any collection of water that the Minister may declare a watercourse. Section 21 of the Act outlines a number of categories that require a water user to apply for a Water Use License (WUL) and Section 22 requires water users to apply for a General Authorisation (GA) with the Department of Water and Sanitation (DWS) if they are under certain thresholds or meet certain criteria. The list of water uses applicable to the proposed Project include: a) Taking water from a water resource; c) Impeding or diverting the flow of water in a watercourse; g) Disposing of waste in a manner which may detrimentally impact on a water resource; i) Altering the bed, banks, course or characteristics of a watercourse; The DWS will make the final decision on water uses that are applicable to the project through a pre-application meeting after which a Water Use Authorisation Application (WUA) as determined by the risk assessment will be undertaken in compliance with procedural regulations published by the DWS within General Notice 267 (GN267). These regulations specify required information per water use and the reporting structure of required supporting technical information.
The National Heritage Resources Act (No. 25 Of 1999)	The National Heritage Resource Act (Act No. 25 of 1999) (NHRA) serves to protect national and provincial heritage resources across South Africa. The NHRA provides for the protection of all archaeological and palaeontological sites, the conservation and care of cemeteries and graves by the South African Heritage Resources Agency (SAHRA) and lists activities that require any person who intends to undertake to notify the responsible heritage resources agency and furnish details regarding the location, nature, and extent of the proposed development. Part 2 of the NHRA details specific activities that require a Heritage Impact Assessment (HIA) that will need to be approved by SAHRA. Parts of Section 35, 36 and 38 apply to the proposed project, principally: ■ Section 35 (4) - No person may, without a permit issued by the responsible heritage resources authority- • destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite; • destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite.

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	▪ Section 38 (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as- • any development or other activity which will change the character of a site— (i) exceeding 5 000 m2 in extent, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development. In terms of Section 38(8), approval from the heritage authority is not required if an evaluation of the impact of such development on heritage resources is required in terms of any other legislation (such as NEMA), provided that the consenting authority ensures that the evaluation of impacts fulfils the requirements of the relevant heritage resources authority in terms of Section 38(3) and any comments and recommendations of the relevant resources authority with regard to such development have been taken into account prior to the granting of the consent. However, should heritage resources of significance be affected by the proposed Igolide WEF, a permit is required to be obtained prior to disturbing or destroying such resources as per the requirements of Section 48 of the NHRA, and the SAHRA Permit Regulations (GN R668). A Heritage Report has been carried out by a suitably qualified specialist, revealing: ▪ Line of planted stones within the study area, which relate to earlier farming activities in the area. The proposed project has been loaded onto the SAHRIS portal, and a case ID has been allocated. This EMPr will be uploaded on the SAHRIS portal (as an appendix to the EIR)for comment by SAHRA and HWC.
Mineral and Petroleum Resources Development Act (No. 28 of 2002)	The aim of the Mineral and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA) is to make provision for equitable access to and sustainable development of the nation's mineral and petroleum resources. Section 53(1) of the MPRDA provides that any person who intends to use the surface of any land in any way that may be contrary to any object of the MPRDA, or which is likely to impede any such object, must apply to the Minister of Mineral Resources (the Minister) for approval. Section 53 of the MPRDA provides a mechanism for ensuring that, inter alia, the mining of mineral resources is not detrimentally affected through the use of the surface of land and which may, for example, result in the sterilisation of a mineral resource. A Section 53 approval will be required due to the fact that the project is located on various mining right areas. The Amendment Regulations (GNR 420 of 27 March 2020) introduced a template for section 53 applications (Form Z) and the specific information that applicants will need to provide as part of a section 53 application.
Noise Control Regulations in terms of the Environmental Conservation, 1989 (Act 73 of 1989)	In South Africa, environmental noise control has been in place for three decades, beginning in the 1980s with codes of practice issued by the South African National Standards (formerly the South African Bureau of Standards, SABS) to address noise pollution in various sectors of the country. Under the previous generation of environmental legislation, specifically the Environmental Conservation Act 73 of 1989 (ECA), provisions were made to control noise from a National level in the form of the Noise Control

Legislation	Description of Legislation and Applicability
	Regulations (GNR 154 of January 1992). In later years, the ECA was replaced by the National Environmental Management Act 107 of 1998 (NEMA) as amended. The National Environmental Management: Air Quality Act 39 of 2004 (NEMAQA) was published in line with NEMA and contains noise control provisions under Section 34: (1) The minister may prescribe essential national standards – (a) for the control of noise, either in general or by specific machinery or activities or in specified places or areas; or (b) for determining – (i) a definition of noise; and (ii) the maximum levels of noise. (2) When controlling noise, the provincial and local spheres of government are bound by any prescribed national standards. Under NEMAQA, the Noise Control Regulations were updated and are to be applied to all provinces in South Africa. The Noise Control Regulations give all the responsibilities of enforcement to the Local Provincial Authority, where location specific by-laws can be created and applied to the locations with approval of Provincial Government. Where province-specific regulations have not been promulgated, acoustic impact assessments must follow the Noise Control Regulations. Furthermore, NEMAQA prescribes that the Minister must publish maximum allowable noise levels for different districts and national noise standards. These have not yet been accomplished and as a result all monitoring and assessments are done in accordance with the South African National Standards (SANS) 10103:2008 and 10328:2008.
National Environment Management Air Quality Act (No. 39 of 2004)	The National Environment Management: Air Quality Act (No. 39 of 2004) (NEMAQA) came into effect on 11 September 2005. Persons undertaking such activities listed under GNR 893, as amended, are required to possess an Atmospheric Emissions License (AEL). The National Dust Control Regulations (GNR 827) were promulgated in terms of Section 32 of NEMAQA, which aim at prescribing general measures for the control of dust in both residential and non-residential areas. Although no AEL will be required for the construction and operation of the Igolide WEF, the dust control regulations will be applicable during construction.
Conservation of Agricultural Resources Act (No. 43 of 1983)	The Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA) provides for the implementation of control measures for soil conservation works as well as alien and invasive plant species in and outside of urban areas. In terms of the amendments to the regulations under the CARA, landowners are legally responsible for the control of alien species on their properties. Various Acts administered by the DFFE and the DWS, as well as other laws (including local by-laws), spell out the fines, terms of imprisonment and other penalties for contravening the law. Although no fines have yet been placed against landowners who do not remove invasive species, the authorities may clear their land of invasive alien plants and other alien species entirely at the landowners' cost and risk.

Legislation	Description of Legislation and Applicability
	The CARA Regulations with regards to alien and invasive species have been superseded by NEMBA Alien and Invasive Species (AIS) Regulations which became law on 1 October 2014.
Civil Aviation Act (No. 13 of 2009)	Civil aviation in South Africa is governed by the Civil Aviation Act (Act 13 of 2009). This Act provides for the establishment of a stand-alone authority mandated with controlling, promoting, regulating, supporting, developing, enforcing and continuously improving levels of safety and security throughout the civil aviation industry. This mandate is fulfilled by South African Civil Aviation Authority (SACAA) as an agency of the Department of Transport (DoT). SACAA achieves the objectives set out in the Act by complying with the Standards and Recommended Practices (SARPs) of the International Civil Aviation Organisation (ICAO), while considering the local context when issuing the South African Civil Aviation Regulations (SA CARs). As of the 1st of May 2021, Air Traffic and Navigation Services (ATNS) has been appointed as the new Obstacle application Service Provider for Windfarms and later Solar Plants. Their responsibility would pertain to the assessments, maintenance, and all other related matters in respect to Windfarms and in due time Power Plant assessments. The DFFE Screening Tool Report identified Civil Aviation as having high sensitivity for the proposed Igolide WEF, with a civil aviation aerodrome located within 8km of the site. ATNS and SACAA have been included on the project stakeholder database.
Occupational Health and Safety Act (No. 85 of 1993)	The National Occupational Health and Safety Act (No. 85 of 1993) (OHSA) and the relevant regulations under the Act are applicable to the proposed project. This includes the Construction Regulations promulgated in 2014 under Section 43 of the Act. Adherence to South Africa's OHSA and its relevant Regulations is essential.
National Energy Act (No. 34 of 2008)	The National Energy Act aims to ensure that diverse energy resources are available, in sustainable quantitates, and at affordable prices, to the South African economy in support of economic growth and poverty alleviation, taking into account environmental management requirements and interactions amongst economic sectors. The main objectives of the Act are to: ▪ Ensure uninterrupted supply of energy to the Republic; ▪ Promote diversity of supply of energy and its sources; ▪ Facilitate effective management of energy demand and its conservation; ▪ Promote energy research; ▪ Promote appropriate standards and specifications for the equipment, systems and processes used for producing, supplying and consuming energy; ▪ Ensure collection of data and information relating to energy supply, transportation and demand; ▪ Provide for optimal supply, transformation, transportation, storage and demand of energy that are planned, organised and implemented in accordance with a balanced consideration of security of supply, economics, consumer protection and a sustainable development; ▪ Provide for certain safety, health and environment matters that pertain to energy; ▪ Facilitate energy access for improvement of the quality of life of the

Legislation	Description of Legislation and Applicability
	people of Republic; ▪ Commercialise energy-related technologies; ▪ Ensure effective planning for energy supply, transportation, and consumption; and ▪ Contribute to sustainable development of South Africa's economy. In terms of the act, the Minister of Energy is mandated to develop and, on an annual basis, review and publish the Integrated Energy Plan (IEP) in the Government Gazette. The IEP analyses current energy consumption trends within different sectors of the economy (i.e. agriculture, commerce, industry, residential and transport) and uses this to project future energy requirements, based on different scenarios. The IEP and the Integrated Resource Plan are intended to be updated periodically to remain relevant. The framework is intended to create a balance between energy demand and resource availability so as to provide low-cost electricity for social and economic development, while taking into account health, safety and environmental parameters.
Electricity Regulation Act (No. 4 of 2006)	The Electricity Regulation Act (No. 4 of 2006) (ERA) aims to: ▪ Achieve the efficient, effective, sustainable and orderly development and operation of electricity supply infrastructure in South Africa; ▪ Ensure that the interests and needs of present and future electricity customers and end users are safeguarded and met, having regard to the governance, efficiency. effectiveness and long-term sustainability of the electricity supply industry within the broader context of economic energy regulation in the Republic: ▪ Facilitate investment in the electricity supply industry; ▪ Facilitate universal access to electricity; ▪ Promote the use of diverse energy sources and energy efficiency; ▪ Promote competitiveness and customer and end user choice; and ▪ Facilitate a fair balance between the interests of customers and end users, licensees, investors in the electricity supply industry and the public. The Act establishes a National Energy Regulator as the custodian and enforcer of the National Electricity Regulatory Framework. The Act also provides for licenses and registration as the manner in which generation, transmission, distribution, trading and the import and export of electricity are regulated.

5.2 POLICIES AND PLANS

Table 5-2 summarised key policies and plans as an outline of the governance framework for the project.

Table 5-2 – Applicable Regional Policies and Plans

Applicable Policy	Description of Policy
National Development Plan	The National Development Plan aims to eliminate poverty and reduce inequality by 2030. The NDP identifies a number of enabling milestones. Of relevance to the proposed development the NDP refers to the need to produce sufficient energy to support industry at competitive prices and ensure access for poor households, while reducing carbon emissions per unit of power by about one-third. In this regard the infrastructure is not just essential for faster economic growth and higher employment. It also promotes inclusive growth, providing citizens with the means to improve their own lives and boost their incomes. Infrastructure is essential to development. Chapter 3, Economy and Employment, identifies some of the structural challenges specific to South Africa, including an energy constraint that will act as a cap on growth and on options for industrialisation. The NDP notes that from an environmental perspective South Africa faces several related challenges. The reduction of greenhouse gas emissions and shift to a green low-carbon economy, is one of these challenges. In terms of implementation the NDP identifies three phases. The first two are of specific relevance to the proposed project. The first phase (2012–2017) notes that ensuring the supply of energy and water is reliable and sufficient for a growing economy. The second phase (2018–2023) involves building on the first phase to lay the foundations for more intensive improvements in productivity. The provision of affordable and reliable energy is a key requirement for this to take place. Chapter 4, Economic infrastructure, notes that economic infrastructure provides the foundation for social and economic development. In this regard South Africa must invest in a strong network of economic infrastructure designed to support the country's medium- and long-term economic and social objectives. The plan envisages that, by 2030, South Africa will have an energy sector that promotes: ▪ Economic growth and development through adequate investment in energy infrastructure. The sector should provide reliable and efficient energy service at competitive rates, while supporting economic growth through job creation. ▪ Environmental sustainability through efforts to reduce pollution and mitigate the effects of climate change. More specifically, South Africa should have adequate supply security in electricity and in liquid fuels, such that economic activity, transport, and welfare are not disrupted. The plan sets out steps that aim to ensure that, in 20 years, South Africa's energy system looks very different to the current situation. In this regard coal will contribute proportionately less to primary-energy needs, while gas and renewable energy resources, will play a much larger role.
Integrated Resource Plan (2010 – 2030)	The IRP is an electricity capacity plan which aims to provide an indication of the country's electricity demand, how this demand will be supplied and what it will cost. On 6 May 2011, the then Department of Energy (DoE) released the

Applicable Policy	Description of Policy
	Integrated Resource Plan 2010-2030 (IRP 2010) in respect of South Africa's forecast energy demand for the 20-year period from 2010 to 2030. The promulgated IRP 2010–2030 identified the preferred generation technology required to meet expected demand growth up to 2030. It incorporated government objectives such as affordable electricity, reduced greenhouse gas (GHG) emissions, reduced water consumption, diversified electricity generation sources, localisation and regional development. The IRP recognises that solar PV, wind and CSP with storage present an opportunity to diversify the electricity mix, to produce distributed generation and to provide off-grid electricity. Renewable technologies also present huge potential for the creation of new industries, job creation and localisation across the value chain.
New Growth Path	Government released the New Economic Growth Path Framework on 23 November 2010. The aim of the framework is to enhance growth, employment creation and equity. The policy's principal target is to create five million jobs over the next 10 years and reflects government's commitment to prioritising employment creation in all economic policies. The framework identifies strategies that will enable South Africa to grow in a more equitable and inclusive manner while attaining South Africa's developmental agenda. Central to the New Growth Path is a massive investment in infrastructure as a critical driver of jobs across the economy. In this regard the framework identifies investments in five key areas namely: energy, transport, communication, water, and housing.
National Infrastructure Plan	The South African Government adopted a National Infrastructure Plan (NIP) in 2012. The NIP aims to transform the South African economic landscape while simultaneously creating significant numbers of new jobs and strengthening the delivery of basic services. It outlines the challenges and enablers which needs to be addressed in the building and developing of infrastructure. The Presidential Infrastructure Coordinating Commission (PICC) was established by the Cabinet to integrate and coordinate the long-term infrastructure build. The plan also supports the integration of African economies. In terms of the plan Government will invest R827 billion over the next three years to build new and upgrade existing infrastructure. The aim of the investments is to improve access by South Africans to healthcare facilities, schools, water, sanitation, housing and electrification. The plan also notes that investment in the construction of ports, roads, railway systems, electricity plants, hospitals, schools and dams will contribute to improved economic growth.
Integrated Energy Plan	The development of a National IEP was envisaged in the White Paper on the Energy Policy of the Republic of South Africa of 1998 and, in terms of the National Energy Act, 2008 (Act No. 34 of 2008), the Minister of Energy is mandated to develop and, on an annual basis, review and publish the IEP in the Government Gazette. The purpose of the IEP is to provide a roadmap of the future energy landscape for South Africa which guides future energy infrastructure investments and policy development. The IEP notes that South Africa needs to grow its energy supply to support economic expansion and in so doing, alleviate supply bottlenecks and supply-demand deficits. In addition, it is essential that all citizens are provided with clean and modern forms of energy at an affordable price. As part of the Integrated Energy Planning process, eight key objectives are identified,

Applicable Policy	Description of Policy
	namely: ▪ Objective 1: Ensure security of supply. ▪ Objective 2: Minimise the cost of energy. ▪ Objective 3: Promote the creation of jobs and localisation. ▪ Objective 4: Minimise negative environmental impacts from the energy sector. ▪ Objective 5: Promote the conservation of water. ▪ Objective 6: Diversify supply sources and primary sources of energy. ▪ Objective 7: Promote energy efficiency in the economy. ▪ Objective 8: Increase access to modern energy. The IEP provides an assessment of current energy consumption trends within different sectors of the economy (i.e., agriculture, commerce, industry, residential and transport) and uses this information to identify future energy requirements, based on different scenarios. The scenarios are informed by different assumptions on economic development and the structure of the economy and also take into account the impact of key policies such as environmental policies, energy efficiency policies, transport policies and industrial policies, amongst others. Based on this information the IEP then determines the optimal mix of energy sources and technologies to meet those energy needs in the most cost-effective manner for each of the scenarios. The associated environmental impacts, socio-economic benefits and macroeconomic impacts are also analysed. The IEP is therefore focused on determining the long-term energy pathway for South Africa, taking into account a multitude of factors which are embedded in the eight objectives. As part of the analysis four key scenarios were developed, namely the Base Case, Environmental Awareness, Resource Constrained and Green Shoots scenarios: ▪ The Base Case Scenario assumes that existing policies are implemented and will continue to shape the energy sector landscape going forward. It assumes moderate economic growth in the medium to long term. ▪ The Environmental Awareness Scenario is characterised by more stringent emission limits and a more environmentally aware society, where a higher cost is placed on externalities caused by the supply of energy. ▪ The Resource Constrained Scenario in which global energy commodity prices (i.e. coal, crude oil and natural gas) are high due to limited supply. ▪ The Green Shoots Scenario describes an economy in which the targets for high economic growth and structural changes to the economy, as set out in the National Development Plan (NDP), are met. The IEP notes that South Africa should continue to pursue a diversified energy mix which reduces reliance on a single or a few primary energy sources. In terms of existing electricity generation capacity, the IEP indicates that existing capacity starts to decline notably from 2025, with significant plant retirement occurring in 2031, 2041 and 2048. By 2050 only 20% of the current electricity generation capacity remains. As a result, large investments are required in the electricity sector in order to maintain an adequate supply in support of economic growth.

Applicable Policy	Description of Policy
	By 2020, various import options become available, and some new coal capacity is added along with new wind, solar and gas capacity. The mix of generation capacity technologies by 2050 is considerably more diverse than the current energy mix, across all scenarios. The main differentiating factors between the scenarios are the level of demand, constraints on emission limits and the carbon dioxide externality costs. In all scenarios the energy mix for electricity generation becomes more diverse over the period to 2050, with coal reducing its share from about 85% in 2015 to 15–20% in 2050 (depending on the scenario). Solar, wind, nuclear, gas and electricity imports increase their share. The Environmental Awareness and Green Shoots scenarios take on higher levels of renewable energy. An assessment of each scenario against the eight objectives with reference to renewable energy notes while all scenarios seek to ensure that costs are minimised within the constraints and parameters of each scenario, the Base Case Scenario presents the least cost followed by the Environmental Awareness, Resource Constrained and Green Shoots scenarios respectively when total energy system costs are considered. In terms of promoting job creation and localisation potential the Base Case Scenario presents the greatest job creation potential, followed by the Resource Constrained, Environmental Awareness and Green Shoots scenarios respectively. In all scenarios, approximately 85% of total jobs are localisable. For electricity generation, most jobs result from solar technologies followed by nuclear and wind, with natural gas and coal making a smaller contribution. The Environmental Awareness Scenario, due to its stringent emission constraints, shows the lowest level of total emissions over the planning horizon. This is followed by the Green Shoots, Resource Constrained and Base Case scenarios. These trends are similar when emissions are considered cumulatively and individually by type.
National Protected Area Expansion Strategy (2018)	The National Protected Area Expansion Strategy 2018 (NPAES) areas were identified through a systematic biodiversity planning process. They present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with strong emphasis on climate change resilience and requirements for protecting freshwater ecosystems. These areas should not be seen as future boundaries of protected areas, as in many cases only a portion of a particular focus area would be required to meet the protected area targets set in the NPAES. They are also not a replacement for fine scale planning which may identify a range of different priority sites based on local requirements, constraints and opportunities (NPAES, 2018). According to the NPAES, the study site is part of the NPAES (NPAES 2018). None of the turbines is located in the areas demarcated by the NPAES.

5.3 PROVINCIAL AND MUNICIPAL LEGAL AND REGULATORY FRAMEWORK

Table 5-3 – Provincial and Municipal Plans

Applicable Plan	Description of Plan
The Gauteng Provincial Employment, Growth and Development Strategy (GEGDS)	The Gauteng Provincial Employment, Growth and Development Strategy (GEGDS) identifies the need for creating accessible and decent work within a growing, sustainable, and inclusive economy as a priority for the province. The GEGDS aims to address the deep structural weaknesses within the economy that has yielded persistent high unemployment and excluded marginalized populations despite the economic growth of the region. Key aims of GEGDS: ▪ Provide a framework within which relevant government departments can develop and/or refine their strategic policy interventions or drivers, while creating decent work and building a growing, inclusive economy. ▪ Identify effective interventions for provincial government to mitigate the impact of economic crises while initiating programmes that can maximise (decent) employment creation in the medium term. ▪ Address inequality through the investment in people and the progressive realisation of decent jobs. ▪ Support social cohesion through interventions that directly contribute towards employment creation and a healthy, well-nourished, and safe labour force. ▪ Highlight the need for effective monitoring, reviewing, and evaluating of the various interventions or drivers. ▪ To act as the framework that leads to the Gauteng Growth Path, which is the living or real implementation of the GEGDS. To achieve this GEGDS proposes necessary and profound structural changes to the Gauteng economy that are based on a rapid shift to an endogenous economy rooted in three key factors: ▪ Innovation. ▪ Green Growth. ▪ Inclusivity. There are three integral components that make up the strategy, namely: the seven foundational provincial priorities, the five strategic pillars, and seven cross-cutting drivers. The foundational provincial priorities of relevance include: ▪ Creating Decent Work and Building a Sustainable and Inclusive Economy. ▪ Building Cohesive and Sustainable Communities including Spatial Development. This GEGDS outlines the strategic interventions by which Gauteng will work to make this innovating, green and inclusive economy a reality. These interventions are organised into five strategic pillars. The strategic pillars of relevance include: ▪ Transforming the provincial economy through improved efficiency. ▪ Sustainable employment creation.

Applicable Plan	Description of Plan
	▪ Sustainable communities and social cohesion. Each pillar contains several government interventions, which enable them to implement this strategy. These are called drivers. Cross-cutting drivers of relevance include: ▪ Green Economy and Sustainable Energy Usage. ▪ Innovation and the Knowledge Economy. ▪ Infrastructure – Strategic, Socio-economic and Bulk. ▪ Green Jobs. ▪ Spatial Planning.
Gauteng Provincial Spatial Development Framework (2030)	The Gauteng Provincial Spatial Development Framework (GSDF) 2030 aspires to establish a compact urban form that has a balanced, polycentric spatial network, with strong and resilient nodes enabling mutually beneficial exchanges of goods and services, and movement of people as well as the protection of green spaces and sustainable energy use. To support this vision, four spatial development strategies are to be followed: ▪ Capitalising on proximity. ▪ Managing new settlement development. ▪ Building an economic network. ▪ Creating a viable and productive hinterland. The effective provision and maintenance of bulk infrastructure, including energy production, is prioritised within the capitalising on proximity strategy. Ten high-priority provincial spatial development proposals are outlined. While none focus specifically on energy production, the following are important in terms of conservation and bulk infrastructure development: ▪ Municipal urban growth management. ▪ Strengthening and enhancing agricultural production and agro-processing. ▪ Actively pursuing environmental management and eco-system protection. ▪ Boosting and optimising provincial tourism opportunities. The GSDF notes that the West Rand District Municipality (WRDM) is currently operating at near capacity in terms of energy production and the lack of stable generation capacity from current providers act as a major constraint to economic development and investor confidence. The GSDF also notes that Merafong's electricity network was not designed to supply the developments and extensions that are currently underway in the district.

Applicable Plan	Description of Plan
Gauteng Integrated Energy Strategy (2012)	The aim of the Gauteng Integrated Energy Strategy (GIES) is to direct the energy supply and consumption of the Gauteng province over the next five to forty-five years by integrating and supporting sustainable energy and climate change initiatives, both locally and internationally. The key goals of this strategy include: ▪ Providing the leadership and institutional framework required to drive the strategy. ▪ Implementing strong energy efficient measures. ▪ Facilitating the development and growth of renewable and alternative energy options. ▪ Supporting the move towards a low carbon economy. ▪ Prioritizing energy security and access to safe, clean, and affordable energy. ▪ Developing and growing the alternative and energy efficiency industry as a critical aspect of Gauteng's economy. The relative policy implications include: ▪ Shifting to a low carbon economy. ▪ Maximizing the use of local energy resources. ▪ Development of the renewable energy industry as an employment creation opportunity. The GIES hopes to achieve a low carbon economy, Gauteng as a hub of innovation, focused on clean energy technology, decentralised energy generation-micro generation, as well as clean and renewable energy contributing 50% of the total energy mix of the province.
Growing Gauteng Together 2030	Growing Gauteng Together 2030 (GGT2030) is a plan of action realised by the Gauteng government to drive the province towards a more sustainable and inclusive future. The plan includes seven priorities that are to be executed to achieve this vision. The relevant priorities include: ▪ The Economy, Jobs, and Infrastructure. ▪ Integrated Human Settlements and Land Release. ▪ Safety, Social Cohesion and Food Security. ▪ Sustainable Development for Future Generations. This vision will be implemented along five developmental corridors of Gauteng. The Western Development Corridor includes WRDM, and the focus is around diversifying the district economy to include tourism, agriculture, and agro-processing, and renewable energy projects.
Merafong City Local Municipality Integrated Development Plan (2020)	The vision for the Merafong City Local Municipality (MCLM) Integrated Development Plan (IDP) is "A prosperous, Sustainable and Community-oriented City". The Key Performance Areas (KPA) adopted by the municipality to realise this vision are: ▪ KPA 1: Basic Service Delivery ▪ KPA 2: To Promote Local Economic Development ▪ KPA 3: To Promote Municipal Transformation & Organisational Development ▪ KPA 4: To ensure Municipal Financial Viability & Management

Applicable Plan	Description of Plan
	▪ KPA 5: To ensure Good Governance and Public Participation ▪ KPA 6: Spatial Development Framework There are various Development Strategies of Merafong Municipality, which are informed by a Strategic Turn-Around plan developed during a strategic review session held in 2018. Of relevance to the project is the Electricity Supply Strategy (2020/2021), which identifies a variety of strategic interventions for the municipality. The Strategic Turnaround Plan is aligned to 14 regional outcomes, with Outcome 1: Provision of Basic Service Delivery as well as Outcome 8: Sustainable Environment being relevant to the project. The MCLMIDP notes that the status of the current Energy Plan needs to be re-assessed to integrate with the greater West Rand Plan.
Merafong City Local Municipality Spatial Development Framework (2019)	Merafong Spatial Development Framework (MSDF), forms part of a hierarchy of plans that consolidate into the IDP. It concentrates on the spatial aspects of development planning and identifies the opportunities and constraints associated with the district. The Merafong City's SDF proposes the following structuring tools: ▪ Improve urban efficiency and rectify Apartheid spatial disparities through realigning the urban structure of Merafong settlements into three distinct urban areas. ▪ Improve urban and rural liveability where basic needs are met, the cost of living is bearable, amenities and employment are accessible, and urban space is aesthetically pleasing and healthy. ▪ Facilitate sustainable economic growth and diversification, through identified strategic nodes, which include a bio-energy eco-industrial park. ▪ Protect natural and agricultural resources to ensure a sustainable coexistence between urban, mining, agricultural and ecological land uses. Opportunities in the MSDF of relevance to the project include a Bioenergy Agro-Industrial Park and the Merafong Solar Farm Cluster Concept. Additionally, the adaptation of unsustainable, unused, or old mines and mine dumps for reuse or rehabilitation also presents an opportunity. The mines Driefontein North and Kusasalethu/Elandsrand were identified as particularly promising for the establishment of solar farms or other renewable energy sources.

5.4 INTERNATIONAL STANDARDS AND GUIDELINES

5.4.1 IFC PERFORMANCE STANDARDS

The International Finance Corporation (IFC) is an international financial institution that offers investment, advisory, and asset management services to encourage private sector development in developing countries. The IFC is a member of the World Bank Group (WBG) and is headquartered in Washington, D.C., United States. It was established in 1956 as the private sector arm of the WBG to advance economic development by investing in strictly for-profit and commercial projects that purport to reduce poverty and promote development.

The IFC's stated aim is to create opportunities for people to escape poverty and achieve better living standards by mobilizing financial resources for private enterprise, promoting accessible and competitive markets, supporting businesses and other private sector entities, and creating jobs and delivering necessary services to those who are poverty-stricken or otherwise vulnerable. Since 2009, the IFC has focused on a set of development goals that its projects are expected to target. Its goals are to increase sustainable agriculture opportunities, improve health and education, increase access to financing for microfinance and business clients, advance infrastructure, help small businesses grow revenues, and invest in climate health.

The IFC is owned and governed by its member countries but has its own executive leadership and staff that conduct its normal business operations. It is a corporation whose shareholders are member governments that provide paid-in capital and which have the right to vote on its matters. Originally more financially integrated with the WBG, the IFC was established separately and eventually became authorized to operate as a financially autonomous entity and make independent investment decisions. It offers an array of debt and equity financing services and helps companies face their risk exposures, while refraining from participating in a management capacity. The corporation also offers advice to companies on making decisions, evaluating their impact on the environment and society, and being responsible. It advises governments on building infrastructure and partnerships to further support private sector development.

The IFC's Sustainability Framework articulates the Corporation's strategic commitment to sustainable development and is an integral part of IFC's approach to risk management. The Sustainability Framework comprises IFC's Policy and Performance Standards on Environmental and Social Sustainability, and IFC's Access to Information Policy. The Policy on Environmental and Social Sustainability describes IFC's commitments, roles, and responsibilities related to environmental and social sustainability. IFC's Access to Information Policy reflects IFC's commitment to transparency and good governance on its operations and outlines the Corporation's institutional disclosure obligations regarding its investment and advisory services. The Performance Standards (PSs) are directed towards clients, providing guidance on how to identify risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the client in relation to project-level activities. In the case of its direct investments (including project and corporate finance provided through financial intermediaries), IFC requires its clients to apply the PSs to manage environmental and social risks and impacts so that development opportunities are enhanced. IFC uses the Sustainability Framework along with other strategies, policies, and initiatives to direct the business activities of the Corporation to achieve its overall development objectives. The PSs may also be applied by other financial institutions (FIs).

The Project is considered a Category B project in terms of the IFC Policy on E&S Sustainability (2012), having the potential to cause limited adverse environmental or social risks and/or impacts that are few in number, generally site specific, largely reversible, and readily addressed through mitigation measures.

The objectives and applicability of the eight PSs are outlined in **Table 5-4.**

Table 5-4 – Objectives and Applicability of the IFC Performance Standards

Reference	Requirements		Project Specific Applicability
Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts			
Overview	Performance Standard 1 underscores the importance of managing environmental and social performance throughout the life of a project. An effective Environmental and Social Management System (ESMS) is a dynamic and continuous process initiated and supported by management, and involves engagement between the client, its workers, local communities directly affected by the project (the Affected Communities) and, where appropriate, other stakeholders."		
Objectives	▪ To identify and evaluate environmental and social risks and impacts of the project. ▪ To adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, and, where residual impacts remain, compensate/offset for risks and impacts to workers, Affected Communities, and the environment. ▪ To promote improved environmental and social performance of clients through the effective use of management systems. ▪ To ensure that grievances from Affected Communities and external communications from other stakeholders are responded to and managed appropriately. ▪ To promote and provide means for adequate engagement with Affected Communities throughout the project cycle on issues that could potentially affect them and to ensure that relevant environmental and social information is disclosed and disseminated.		
Aspects	1.1	Policy	The IFC Standards state under PS 1 (Guidance Note 23) that "*the breadth, depth and type of analysis included in an ESIA must be proportionate to the nature and scale of the proposed project's potential impacts as identified during the course of the assessment process*." This document is the draft deliverable from the S&EIA process (EIA Phase) undertaken for the proposed Project. The impact assessment comprehensively assesses the key environmental and social impacts and complies with the requirements of the South African EIA Regulations. In addition, an EMPr has been compiled during this, for the project.
	1.2	Identification of Risks and Impacts	
	1.3	Management Programmes	
	1.4	Organisational Capacity and Competency	
	1.5	Emergency Preparedness and Response	
	1.6	Monitoring and Review	
	1.7	Stakeholder Engagement	
	1.8	External Communication and Grievance Mechanism	
	1.9	Ongoing Reporting to Affected Communities	
Performance Standard 2: Labour and Working Conditions;			
Overview	Performance Standard 2 recognises that the pursuit of economic growth through employment creation and income generation should be accompanied by protection of the fundamental rights of workers.		

Reference	Requirements		Project Specific Applicability
Objectives	▪ To promote the fair treatment, non-discrimination, and equal opportunity of 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.		
Aspects	2.1	▪ Working Conditions and Management of Worker Relationship ▪ Human Resources Policy and Management ▪ Working Conditions and terms of Engagement ▪ Workers organisation ▪ Non- Discrimination and Equal Opportunity ▪ Retrenchment ▪ Grievance Mechanism	Even though the nature and scale of the project is considered to be small, PS2 is considered applicable as a contractor will be appointed to undertake the required scope of work. Whilst PS2 will be applicable to the Project, it is not intended to be addressed in detail at the EIA stage. Recommendations are provided concerning development of a detailed Human Resources (HR) and Occupational Health and Safety (OHS) system by the developer and its partners as the Project moves towards implementation. In addition, measures to address the Interim Advice for IFC Clients on Supporting Workers in the Context of COVID-19 are referenced. The EMPr incorporates the requirements for compliance with local and international Labour and Working legislation and good practice on the part of the contractors.
	2.2	▪ Protecting the Workforce ▪ Child Labour ▪ Forced Labour	
	2.3	Occupational health and Safety	
	2.4	Workers Engaged by Third Parties	
	2.5	Supply Chain	
Performance Standard 3: Resource Efficiency and Pollution Prevention			
Overview	Performance Standard 3 recognises that increased economic activity and urbanisation often generate increased levels of pollution to 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 greenhouse gases (GHG) threatens the public health and welfare of current and future generations. At the same time, more efficient and effective resource use and pollution prevention and GHG emission avoidance and mitigation technologies and practices have become more accessible and achievable in virtually all parts of the world.		
Objectives	▪ To avoid or minimise adverse impacts on human health and the environment by avoiding or minimising pollution from project activities. ▪ To promote more sustainable use of resources, including energy and water. ▪ To reduce project related GHG emissions.		
Aspects	3.1	▪ Policy Resource Efficiency ▪ Greenhouse Gases ▪ Water Consumption	PS3-related impacts, such as the management of construction waste, hazardous substances, and stormwater are assessed in the Draft EIA Report

Reference	Requirements		Project Specific Applicability
	3.2	▪ Pollution Prevention ▪ Air Emissions ▪ Stormwater ▪ Waste Management ▪ Hazardous Materials Management ▪ Pesticide use and Management	There are no material resource efficiency issues associated with the Project. The EMPr includes general resource efficiency measures. The Igolide WEF seeks to facilitate resource efficiency and pollution prevention by contributing to the South African green economy. Dust air pollution in the construction phase has been addressed in the EMPr. The Project will not result in the release of industrial effluents. Potential pollution associated with sanitary wastewater is low and mitigation measures are included in this EMPr. Land contamination of the site from historical land use (i.e. low intensity agricultural / grazing) is not considered to be a cause for concern. The waste generation profile of the project is not complex. Waste mitigation and management measures have been included in EMPr. Hazardous materials are not a key issue; small quantities of construction materials (oil, grease, diesel fuel etc.) are the only wastes expected to be associated with the project. The EMPr considers anticipated hazardous materials into account and recommends relevant mitigation and management measures.
Performance Standard 4: Community Health, Safety, and Security			
Overview	Performance Standard 4 recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts.		
Objectives	▪ To anticipate and avoid adverse impacts on the health and safety of the Affected Community during the project life from both routine and non-routine circumstances. ▪ To ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the Affected Communities		
Aspects	4.1	▪ Community Health and Safety ▪ Infrastructure and Equipment Design and Safety ▪ Hazardous Materials Management and Safety ▪ Ecosystem Services ▪ Community Exposure to Disease ▪ Emergency Preparedness and Response	The requirements included in PS 4 has been addressed in the EIA process and the development of the EMPr. During the construction phase there will be an increase in vehicular traffic along public roads, largely due to the need for importation of construction material. Pedestrian and road safety risks have been qualitatively evaluated in the EIA process and the clients' standard safety and security measures, as well as potential additional measures recommended by WSP, are detailed in the EMPr .
	4.2	Security Personnel	

Reference	Requirements		Project Specific Applicability
Performance Standard 5: Land Acquisition and Involuntary Resettlement			
Overview	Performance Standard 5 recognises that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons that use this land. Involuntary resettlement refers both to physical displacement (relocation or loss of shelter) and to economic displacement (loss of assets or access to assets that leads to loss of income sources or other means of livelihood) as a result of project-related land acquisition and/or restrictions on land use.		
Objectives	▪ 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 (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.		
Aspects	5.1	▪ Displacement ▪ Physical Displacement ▪ Economic Displacement ▪ Private Sector Responsibilities under Government Managed Resettlement	PS5 is not applicable to the proposed Igolide WEF as no physical or economic displacement or livelihood restoration will be required. The proposed Igolide WEF is located on privately owned land. A section of the land is utilised for agriculture by the landowners. Other parts of the site are used for residential, mixed farming, commercial hunting, and tourism purposes. The significance of all potential agricultural impacts is kept low by the very small proportion of the land that is impacted. An Agricultural Potential Assessment has been undertaken and is included in the Draft EIA Report.
Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources			
Overview	Performance Standard 6 recognizes that protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources are fundamental to sustainable development.		
Objectives	▪ To protect and conserve biodiversity. ▪ To maintain the benefits from ecosystem services. ▪ To promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities.		
Aspects	6.1	Protection and Conservation of Biodiversity	The Igolide WEF overlaps with a small isolated CBA (CBA2: Important) in the Eastern Corner of the footprint. A Terrestrial Biodiversity assessment as well as an Avifaunal Impact Assessment and Aquatic Biodiversity Impact Assessment have been included in the Draft EIA report . The methodologies for the specialist assessments include a combination of literature review, in-field surveys and sensitivity mapping. This substantively complies with the

Reference	Requirements		Project Specific Applicability
			PS 6 general requirements for scoping and baseline assessment for determination of biodiversity and ecosystem services issues. The determination of habitat sensitivity was undertaken within the legal and best practice reference framework for South Africa. The prevalence of invasive alien species has been determined, and mitigation and management measures area included in this EMPr.
Performance Standard 7: Indigenous People			
Overview	Performance Standard 7 recognizes that Indigenous Peoples, as social groups with identities that are distinct from mainstream groups in national societies, are often among the most marginalized 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. Indigenous Peoples are particularly vulnerable if their lands and resources are transformed, encroached upon, or significantly degraded.		
Objectives	▪ 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.		
Aspects	7.1	General ▪ Avoidance of Adverse Impacts ▪ Participation and Consent	As per the international instruments under the United Nations (UN) Human Rights Conventions, no indigenous peoples are present within the study area.
	7.2	Circumstances Requiring Free, Prior, and Informed Consent ▪ Impacts on Lands and Natural Resources Subject to Traditional Ownership or Under Customary Use ▪ Critical Cultural Heritage ▪ Relocation of Indigenous Peoples from Lands and Natural Resources	

Reference	Requirements		Project Specific Applicability
		Subject to Traditional Ownership or Under Customary Use	
	7.3	Mitigation and Development Benefits	
	7.4	Private Sector Responsibilities Where Government is Responsible for Managing Indigenous Peoples Issues	
Performance Standard 8: Cultural Heritage			
Overview	Performance Standard 8 recognizes the importance of cultural heritage for current and future generations.		
Objectives	▪ 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.		
Aspects	8.1	Protection of Cultural Heritage in Project Design and Execution	A Heritage Assessment has been carried out by a suitably qualified specialist. A Chance Find Procedure has been included in this EMPr .

5.4.2 WORLD BANK GROUP ENVIRONMENTAL HEALTH AND SAFETY GUIDELINES

In support of the Performance Standards, the World Bank Group (WBG) has published a number of Environmental Health and Safety (EHS) Guidelines. The EHS Guidelines are technical reference documents that address IFC's expectations regarding the industrial pollution management performance of its projects. They are designed to assist managers and decision makers with relevant industry background and technical information. This information supports actions aimed at avoiding, minimising, and controlling EHS impacts during the construction, operation, and decommissioning phase of a project or facility. The EHS Guidelines serve as a technical reference source to support the implementation of the IFC Performance Standards, particularly in those aspects related to PS3: Pollution Prevention and Abatement, as well as certain aspects of occupational and community health and safety.

Where host country regulations differ from the levels and measures presented in the EHS Guidelines, projects seeking international funding may be expected to achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, a full and detailed justification for any proposed alternatives is required.

The following IFC / WBG EHS Guidelines have been generally consulted during the preparation of the EIA in order to aid the identification of EHS aspects applicable to the project:

- Electric Power Transmission and Distribution (2007) - information relevant to power transmission between a generation facility and a substation located within an electricity grid, in addition to

power distribution from a substation to consumers located in residential, commercial, and industrial areas

- General EHS Guidelines – this includes a section on a range of environmental, occupational health and safety, community health and safety, and construction activities that would apply to the project. The guideline also contains recommended guidelines adopted form the World Health Organisation (WHO) for ambient air and water quality, which are referred to in the relevant impact assessment sections in the EIA report.

5.4.3 EQUATOR PRINCIPLES

The Equator Principles (EPs) is a risk management framework, adopted by financial institutions, for determining, assessing, and managing environmental and social risk in projects and is primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making.

The EPs apply globally to all industry sectors and to five financial products 1) Project Finance Advisory Services, 2) Project Finance, 3) Project-Related Corporate Loans, 4) Bridge Loans and 5) Project-Related Refinance and Project-Related Acquisition Finance. The relevant thresholds and criteria for application is described in detail in the Scope section of the EP. Currently 125 Equator Principles Financial Institutions (EPFIs) in 37 countries have officially adopted the EPs, covering the majority of international project finance debt within developed and emerging markets. EPFIs commit to implementing the EPs 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 EPs.

While the EPs are not intended to be applied retroactively, EPFIs apply them to the expansion or upgrade of an existing project where changes in scale or scope may create significant environmental and social risks and impacts, or significantly change the nature or degree of an existing impact. The EPs have greatly increased the attention and focus on social/community standards and responsibility, including robust standards for indigenous peoples, labour standards, and consultation with locally affected communities within the Project Finance market.

The EPs have also helped spur the development of other responsible environmental and social management practices in the financial sector and banking industry and have supported member banks in developing their own Environmental and Social Risk Management Systems.

The requirements and applicability of the EPs are outlined in **Table 5-5**.

It should be noted that Principles 8 and 10 relate to a borrower's code of conduct and are therefore not considered relevant to the S&EIA process and have not been included in this discussion.

Table 5-5 - Requirements and Applicability of the Equator Principles

Requirement		Project Specific Applicability
Principle 1: Review and Categorisation		
Overview	When a project is proposed for financing, the EPFI will, as part of its internal social and environmental review and due diligence, categorise such project based on the magnitude of its potential impacts and risks in accordance	Based upon the significance and scale of the Project's environmental and social impacts, the proposed project is regarded as a Category B project i.e. a project with potential limited adverse

Requirement		Project Specific Applicability
	with the environmental and social screening criteria of the IFC. Using categorisation, the EPFI's environmental and social due diligence is commensurate with the nature, scale, and stage of the Project, and with the level of environmental and social risks and impacts. The categories are: ▪ Category A: Projects with potential significant adverse environmental and social risks and/or impacts that are diverse, irreversible or unprecedented; ▪ Category B: Projects with potential limited adverse environmental and social risks and/or impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures; and ▪ Category C: Projects with minimal or no adverse environmental and social risks and/or impacts.	environmental or social risks and/or impacts that are few in number, generally site-specific, largely reversible, and readily addressed through mitigation measures.
Principle 2: Environmental and Social Assessment		
Overview	For all Category A and Category B Projects, the EPFI will require the client to conduct an appropriate Assessment process to address, to the EPFI's satisfaction, the relevant environmental and social risks and scale of impacts of the proposed Project (which may include the illustrative list of issues found in Exhibit II). The Assessment Documentation should propose measures to minimise, mitigate, and where residual impacts remain, to compensate/offset/remedy for risks and impacts to Workers, Affected Communities, and the environment, in a manner relevant and appropriate to the nature and scale of the proposed Project. The Assessment Documentation will be an adequate, accurate and objective evaluation and presentation of the environmental and social risks and impacts, whether prepared by the client, consultants or external experts. For Category A, and as appropriate, Category B Projects, the Assessment Documentation includes an Environmental and Social Impact Assessment (ESIA). One or more specialised studies may also need to be undertaken. For other Category B and potentially C Projects, a limited or focused environmental or social assessment may be appropriate, applying applicable risk management standards relevant to the risks or impacts identified during the categorisation	This document is the third deliverable (i.e., Draft EIA Report) from the S&EIA process undertaken for the proposed Project. The impact assessment has been undertaken, and comprehensively assesses the key environmental and social impacts and complies with the requirements of the South African EIA Regulations. In addition, an EMPr has been be compiled.

Requirement		Project Specific Applicability
	process.	
Principle 3: Applicable Environmental and Social Standards		
Overview	The Assessment process should, in the first instance, address compliance with relevant host country laws, regulations and permits that pertain to environmental and social issues. The EPFI's due diligence will include, for all Category A and Category B Projects globally, review and confirmation by the EPFI of how the Project and transaction meet each of the Principles. For Projects located in Non-Designated Countries, the Assessment process evaluates compliance with the then applicable IFC PS and WBG EHS Guidelines. For Projects located in Designated Countries, compliance with relevant host country laws, regulations and permits that pertain to environmental and social issues.	As South Africa has been identified as a non-designated country, the reference framework for environmental and social assessment is based on the IFC PS. In addition, this S&EIA process has been undertaken in accordance with NEMA (the host country's relevant legislation).
Principle 4: Environmental and Social Management System and Equator Principles Action Plan		
Overview	For all Category A and Category B Projects, the EPFI will require the client to develop or maintain an Environmental and Social Management System (ESMS). Further, an Environmental and Social Management Plan (ESMP) will be prepared by the client to address issues raised in the assessment process and incorporate actions required to comply with the applicable standards. Where the applicable standards are not met to the EPFI's satisfaction, the client and the EPFI will agree on an Equator Principles Action Plan (EPAP). The EPAP is intended to outline gaps and commitments to meet EPFI requirements in line with the applicable standards.	A formal project specific ESMS will be compiled in the event that the project is developed in the future. Management and monitoring plans outlined in the EMPr will serve as the basis for an ESMS for the proposed Project.
Principle 5: Stakeholder Engagement		
Overview	EPFI will require the client to demonstrate effective Stakeholder Engagement as an ongoing process in a structured and culturally appropriate manner with Affected Communities Workers and, where relevant, Other Stakeholders. For Projects with potentially significant adverse impacts on Affected Communities, the client will conduct an Informed Consultation and Participation process. To accomplish this, the appropriate assessment documentation, or non-technical summaries thereof, will be made available to the public by the borrower for a reasonable minimum period in the relevant local language and in a culturally	The S&EIA process includes an extensive stakeholder engagement process which complies with the South African EIA Regulations. The process includes consultations with local communities, nearby businesses, and a range of government sector stakeholders (state owned enterprises, national, provincial, and local departments). The stakeholder engagement process solicits interest from potentially interested parties through the

Requirement		Project Specific Applicability
	appropriate manner. The borrower will take account of and document the process and results of the consultation, including any actions agreed resulting from the consultation. Disclosure of environmental or social risks and adverse impacts should occur early in the Assessment process, in any event before the Project construction commences, and on an ongoing basis.	placement of site notices and newspaper advertisements as well as written and telephonic communication. The stakeholder engagement process is detailed in the SER **(Appendix D** of the Draft EIA Report).
Principle 6: Grievance Mechanism		
Overview	For all Category A and, as appropriate, Category B Projects, the EPFI will require the client, as part of the ESMS, to establish effective grievance mechanisms which are designed for use by Affected Communities and Workers, as appropriate, to receive and facilitate resolution of concerns and grievances about the Project's environmental and social performance. The borrower will inform the Affected Communities and Workers about the grievance mechanism in the course of the stakeholder engagement process and ensure that the mechanism addresses concerns promptly and transparently, in a culturally appropriate manner, and is readily accessible, at no cost, and without retribution to the party that originates the issue or concern.	This EMPr includes a Grievance Mechanism Process for Public Complaints and Issues. This procedure effectively allows for external communications with members of the public to be undertaken in a transparent and structured manner.
Principle 7: Independent Review		
Overview	For all Category A and, as appropriate, Category B Projects, an Independent Environmental and Social Consultant, not directly associated with the client, will carry out an Independent Review of the Assessment Documentation including the ESMPs, the ESMS, and the Stakeholder Engagement process documentation in order to assist the EPFI's due diligence, and assess Equator Principles compliance.	This principle will only become applicable in the event that the project is developed in the future.
Principle 9: Independent Monitoring and Reporting		
Overview	To assess Project compliance with the Equator Principles after Financial Close and over the life of the loan, the EPFI will require independent monitoring and reporting for all Category A, and as appropriate, Category B projects. Monitoring and reporting should be provided by an Independent Environmental and Social Consultant; alternatively, the EPFI will require that the client retain qualified and experienced external experts to verify its monitoring	This principle will only become applicable in the event that the project is developed in the future.

Requirement		Project Specific Applicability
	information, which will be shared with the EPFI in accordance with the frequency required.	

5.5 OTHER GUIDELINES AND BEST PRACTICE RECOMMENDATIONS

5.5.1 GENERIC EMPR RELEVANT TO AN APPLICATION FOR SUBSTATION AND OVERHEAD ELECTRICITY TRANSMISSION AND DISTRIBUTION INFRASTRUCTURE

NEMA requires that an EMPr be submitted where an EIA has been identified as the environmental instrument to be utilised as the basis for a decision on an application for environmental authorisation. The content of an EMPr must either contain the information set out in Appendix 4 of the EIA Regulations, 2014, as amended, or must be a generic EMPr relevant to an application as identified and gazetted by the Minister in a government notice. Once the Minister has identified, through a government notice, that a generic EMPr is relevant to an application for EA, that generic EMPr must be applied by all parties involved in the EA process, including, but not limited to, the applicant and the CA.

GN 435 of 22 March 2019 identified a generic EMPr relevant to applications for substations and overhead electricity transmission and distribution infrastructure which require authorisation in terms of Section 42(2) of NEMA. Applications for overhead electricity transmission and distribution infrastructure that trigger Activity 11 of Listing Notice 1 or Activity 9 of Listing Notice 2 and any other listed or specified activities must use the generic EMPr.

The objective of the generic EMPr is "*to prescribe and pre-approve generally accepted impact management outcomes and impact management actions, which can commonly and repeatedly be used for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of overhead electricity transmission and distribution infrastructure. The use of a generic EMPr is intended to reduce the need to prepare and review individual EMPrs for applications of a similar nature*."

The generic EMPrs for Substations and powerlines have been included in the Site-Specific EMPr (**Appendix D** and **Appendix E**).

5.6 ADDITIONAL PERMITS AND AUTHORISATIONS

Table 5-6 outlines the additional permits and authorisations required for the proposed development, as well as the relevant Competent Authorities responsible.

Table 5-6 – Additional Permits and Authorisations required for the proposed development

Permits / Authorisation	Legislation	Relevant Authority	Status
Notification Of Intent To Develop (NID) Section 38 (1) and Section 38 (8)	Section 38 (1) & (8) of the NHRA	HWC and SAHRA	Submitted – Case ID: 21549
Subdivision of Agricultural Land Act (SALA) Consent /	Subdivision of Agricultural Land Act (Act No. 70 of 1970) / Spatial Planning	DALRRD	An application will be submitted following conclusion of the EIA

Permits / Authorisation	Legislation	Relevant Authority	Status
Change of Land Use (re-zoning)	and Land Use Management Act (Act No. 16 of 2013) (SPLUMA)		process and receipt of an EA
Water Use Licence / General	National Water Act (Act No. 36 of 1998)	Department of Water and Sanitation	An application will be submitted following the conclusion of the EIA process
Obstacle Permit	Civil Aviation Act (Act 13 of 2009)	Air Traffic and Navigation Services / Civil Aviation Authority	An application has already been submitted to ATNS
Section 53 Approval	Minerals and Petroleum Resources Development Act (No. 28 of 2002)	Department of Mineral Resources and Energy	An application will be submitted during the EIA process
Permits for removal or destruction of Threatened or Protected Species (TOPs)	Transvaal Nature Conservation Ordinance (No. 12 of 1983	GDARD	Permits will be obtained prior to the commencement of construction.

6 MANAGEMENT PROCEDURES AND ADMINISTRATIVE REQUIREMENTS

6.1 ORGANISATIONAL STRUCTURE AND RESPONSIBILITIES

Formal responsibilities are necessary to ensure that key management measures/procedures are executed. Igolide Wind (Pty) Ltd (Igolide), (the Project Company), will be responsible for the overall control of the project site during the pre-construction, construction, operation, decommissioning and rehabilitation phases of the project. Igolide's responsibilities will include the following:

- Appointing an independent environmental control officer (ECO) for the duration of the Contract during construction and as specified by the DFFE during operation;
- Being fully familiar with the EIR, EA conditions and the EMPr;
- Applying for an amendment of the EA from the DFFE as and when required in line with the prevailing legislation;
- The overall implementation of the EMPr;
- Ensuring compliance, by all parties, and the imposition of penalties for noncompliance;
- Implementing corrective and preventive actions, where required;
- Ensuring that any other necessary permits or licences are obtained and complied with;
- Preventing pollution and actions that will harm or may cause harm to the environment;
- Notifying the DFFE within 30 days that construction activity will commence;
- Notifying the DFFE in writing within 24 hours if any condition in the EA cannot be or is not adhered to; and
- Notifying the DFFE 14 days prior to commencement of the operational phase.

Specific roles and responsibilities for the construction phase of this project are as defined in **Table 6-1**.

While the term ECO is referenced in Specialist Reports, the ECO is an independent function, reporting to the DFFE. The term used in this EMPr for the Permit Holder's onsite compliance management function is Environmental Site Compliance Officer (ESCO).

Table 6-1 – Roles and Responsibilities

Designation	Roles and Responsibilities
DFFE	▪ Is the designated authority responsible for authorising this EMPr and has overall responsibility for ensuring that Igolide complies with this EMPr, and any conditions listed in the Environmental Authorisation. ▪ Shall also be responsible for approving any significant amendments that may be required to the EMPr. ▪ May further perform random site inspections to check compliance with the EMPr.
Holder of the EA	▪ The Holder of the EA shall take overall responsibility for the adherence to the EMPr and EA conditions.
Project	▪ Ensure that Igolide and the relevant contractor/s are aware of all

Designation	Roles and Responsibilities
Manager/Engineer/Site Engineer	specifications, and legal constraints pertaining to the project during construction, specifically with regards to the environment. ▪ Ensure that all stipulations within the EMPr and conditions of the environmental authorisation are communicated and adhered to by Igolide and its contractor(s). ▪ Monitor the implementation of the EMPr and conditions of the environmental authorisation throughout the project by means of site inspections and meetings. This will be documented as part of the site meeting minutes. ▪ Be fully conversant with the EIR for the project, the conditions of environmental authorisation and all relevant environmental legislation.
Site Manager (EPC Contractor)	▪ Be fully conversant with the EIR, the conditions of environmental authorisation and the EMPr. ▪ Approve method statements (co-approval with the ESCO). ▪ Provide support to the ESCO. ▪ Be fully conversant with all relevant environmental legislation and ensure compliance thereof. ▪ Have overall responsibility for the implementation of the EMPr and conditions of the environmental authorisation ▪ Ensure that audits are conducted to ensure compliance to the EMPr and conditions of the environmental authorisation. ▪ Liaise with the Project Manager or his delegate, the ESCO and others on matters concerning the environment ▪ Prevent actions that will harm or may cause harm to the environment and take steps to prevent pollution and unnecessary degradation onsite. ▪ Confine construction activities to demarcated areas.
Environmental Officer (EO)	The EO must be appointed by the Contractor / Project Manger and is responsible for managing the day-to-day onsite implementation of the EMPr, and for the compilation of weekly environmental monitoring reports during construction. During the operational phase environmental monitoring reports may be as specified by the DFFE (such as annually) by the external EO or ECO. In addition, the EO must act as liaison and advisor on all environmental and related issues, seek advice from the ESCO when necessary, and ensure that any complaints received from I&APs are duly processed and addressed and that conflicts are resolved in an acceptable manner and timely manner. The EO shall be a full-time dedicated member of the Contractor's team and must be approved by Igolide (Project Company). The following qualifications, qualities and experience are recommended for the individual appointed as the EO: ▪ A relevant environmental diploma or degree in natural sciences, as well as a minimum of three years' experience in construction site monitoring, excluding health and safety; ▪ A level-headed and firm person with above-average communication and negotiating skills. The ability to handle and address conflict management situations will be an advantage; and ▪ Relevant experience in environmental site management and EMPr compliance monitoring. The EO's responsibilities include, but not limited to: ▪ Monitoring, on a daily basis, environmental specifications on site and compliance with the conditions of the EA, environmental legislation and EMPr;

Designation	Roles and Responsibilities
	▪ Keeping a register of compliance / non-compliance with the environmental specifications; ▪ Identifying and assessing previously unforeseen, actual or potential impacts on the environment; ▪ Ensuring that a brief weekly environmental monitoring report is submitted to the ESCO; ▪ Conducting site inspections during the defects liability period, and bringing any environmental concerns to the attention of the ESCO and Contractor; ▪ Advising the Contractor on the rectification of any pollution, contamination or damage to the construction site, rights of way and adjacent land; ▪ Attending site meetings (scheduled and ad hoc); ▪ Presenting the environmental awareness training course to all staff, Contractors and Sub contractors, and monitoring the environmental awareness training for all new personnel on-site, as undertaken by the Contractor; ▪ Ensuring that a copy of the EA and the latest version of the EMPr are available on site at all times, and maintaining a records-keeping system of all compliance and environmental documentation; ▪ Ensuring that the Contractor is made aware of all applicable changes to the EMPr that are approved by the DEA; ▪ Assisting the Contractor in drafting environmental method statements and/or the Environmental Policy where such knowledge/expertise is lacking; ▪ Undertaking daily environmental monitoring to ensure the Contractor's activities do not impact upon the receiving environment. Such monitoring shall include dust, noise and water monitoring; and ▪ Maintaining the following on site: • A weekly site diary. • A non-conformance register (NCR). • An I&AP communications register, and • A register of audits. • Records of all communication received in relation to compliance actions. The EO will remain employed until all rehabilitation measures, as required for implementation due to construction damage, are completed and the site is handed over to the Operator.
ESCO	A suitably qualified ESCO must be appointed by the Holder of the EA to monitor the project compliance onsite on a full-time basis. Responsibilities of the ESCO include: ▪ Be fully conversant with the EIR, the conditions of environmental authorisation and the EMPr; ▪ Be fully conversant with all relevant environmental legislation and ensure compliance thereof; ▪ Approve method statements (co-approval with the Site Manager); ▪ Remain employed until the completion of the construction activities; and ▪ Report to the Project Manager, including all findings identified onsite. In addition, the ESCO will: ▪ Undertake monthly inspections of the site and surrounding areas in order to audit compliance with the EMPr and conditions of the environmental authorisation; ▪ Take appropriate action if the specifications contained in the EMPr and conditions of the environmental authorisation are not followed; ▪ Monitor and verify that environmental impacts are kept to a minimum, as far

Designation	Roles and Responsibilities
	as possible; and ▪ Ensure that activities onsite comply with all relevant environmental legislation.
ECO	▪ A suitably qualified external ECO must be appointed by the Holder of the EA to audit the project compliance in terms of the EMPr and conditions of the EA on a monthly basis, during the construction phase. ▪ The costs of the ECO shall be borne by the Holder of the EA (proof of appointment must be maintained onsite).
Contractors, Staff and Service Providers	▪ Prepare Method Statements as per the EMPr, and ensure all activities are conducted as per the approved Method Statements. ▪ Regular on-site auditing to assess performance against the requirements of this EMPr. ▪ Completion of the appropriate training requirements as specified in the training program. ▪ Implementation and maintenance of environmental management controls as set out in the project's environmental management documentation.

Refer to: Table 1 (Part A, Section 3) of the Generic EMPr for the development and expansion of substation infrastructure for the transmission and distribution of electricity, attached as Appendix D and Table 1 (Part A, Section 3) of the Generic EMPr for the development of overhead transmission and distribution infrastructure, attached as Appendix E.

6.2 ENVIRONMENTAL AWARENESS PLAN

Legislation requires that Igolide (via the appointed EPC contractor/contractor/principal contractor) must develop an environmental awareness plan that describes the manner in which Igolide intends to inform employees of any environmental risks which may result from their work and the manner in which the risks must be dealt with in order to avoid pollution or the degradation of the environment. In recognition of the need to protect our environment, environmental management should not only be seen as a legal obligation but also as a moral obligation.

It is important to ensure that all relevant personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and ongoing minimisation of environmental degradation and harm.

To achieve effective environmental management, it is important that employees, contractors (including subcontractors) are aware of the responsibilities in terms of the relevant environmental legislation and the contents of the EMPr, conditions of the environmental authorisation.

Igolide will provide appropriate resources to facilitate social and environmental awareness training during the construction, operational and decommissioning phases of the project. Igolide will require that all managers associated with the project adhere to the mitigation/management measures detailed in the EMPr and identify, evaluate, and minimise risks to the social, physical and biophysical environments. This will be implemented by educating employees in social and environmental matters and responsibilities relating to performance of their assigned tasks. Furthermore, employees will be entrusted to maintain the necessary level of environmental performance for their activities. Contractors, and their associated sub-contractors, will also need to demonstrate compliance to mitigation/ management measures included in the EMPr.

The following methodology described must be used to implement and ensure environmental and social awareness and competence:

6.2.1 INTERNAL COMMUNICATION

Internal Communication of environmental issues to ensure environmental awareness will be achieved by using any combination of the following means:

- Meetings;
- Memos;
- Notice boards;
- Briefs;
- Reports;
- Monthly themes;
- Daily operational bulletins;
- Newsletter;
- E-mail;
- Telephone; and
- Induction training.

6.2.2 STANDARD MEETINGS

The following standard meetings will be held at specific times to ensure that environmental and social awareness; potential problems; complaints etc. are heard and addressed proactively:

- Safety, Health and Environmental Meetings will be held monthly by the Senior Management;
- Safety, Health and Environmental Meetings will be held weekly (during construction) and monthly (during operation) by the relevant personnel, environmental and social issues will form part of the agenda;
- Communication between all personnel and Senior Management will be facilitated through the appropriate reporting lines, or by using complaint and incident forms.

6.2.3 ENVIRONMENTAL AND SOCIAL TALK TOPICS

Monthly environmental and social talk topics must be compiled and distributed/shared to relevant personnel and must be displayed on appropriate notice boards or shared by whatever means established on site. As a minimum, the following topics must be considered during the course of the construction phase:

- Water Quality;
- Water Use and Consumption;
- Air Quality i.e. dust;
- Power Consumption and Energy Efficiency;
- Waste Management;
- Fauna and Flora;
- Emergency Procedures;
- Incidents Reporting;
- Systems;
- Noise;
- Heritage Impacts;
- Landowner Etiquette;

- Speed Limits;
- Health Risks (such as HIV/ Aids); and
- General Awareness (e.g. World Environment Day, National Arbour Day).

6.2.4 GENERAL COMMUNICATIONS

Communication to the community, government, landowners, neighbouring farmers, environmental groups, non-government organisations and other stakeholders will be communicated to ensure environmental and social awareness by means of the following:

- Fax or E-mail;
- Telephone; or
- Formal meetings.

6.2.5 TRAINING

It is important to ensure that all personnel, contractors and their sub-contractors have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and on-going minimisation of environmental harm. As a minimum environmental training must include the following:

- Employees must have a basic understanding of the key environmental features of the site and the surrounding environment.
- Employees will be thoroughly familiar with the requirements of the EMPr and the environmental specifications as they apply to the project.
- Employees must undergo training for the operation and maintenance activities associated with project and have a basic knowledge of the potential environmental impacts that could occur and how they can be minimised and mitigated.
- Awareness of any other environmental matters, which are deemed to be necessary by the Environmental Officer.
- Training must include the environment, health and safety as well as basic HIV/AIDS education.

The following facets to training form part of this Environmental and Social Awareness Plan:

- **Induction:** Environmental and social awareness training will be given at induction when personnel join the company and/or return from leave. Induction training will also be given to visitors entering the site. Induction training will include, inter alia:
  - A discussion on the environment concept, what does it comprise of and how do we interact with it;
  - A description on the components and phases of the specific renewable power generation facility;
  - A general account of how the facility and its associated activities can affect the environment, giving rise to what are called environmental impacts;
  - A discussion on what staff can do in order to help prevent the negative environmental impacts from degrading the environment i.e., environmental impact management.
- **Job Specific Training:** Job specific training programmes will be developed as and when required. The programs will be based on the significant environmental and social aspects/ impacts that are identified during regular audits and site inspections. Supervisory staff will be

equipped with the necessary knowledge and information to guide their employees on environmental and social aspects applicable to performing a specific task.

- **Competency Training:** The Environmental Officer will be responsible for the environmental and social competency and awareness training of Middle Management and supervisors. This training will be performed both on a one-on-one basis and through workshops and presentations. Competence and the effectiveness of training and development initiatives will be determined through the following methods:

  - Trend analysis of incidents reported; and
  - Analysis of work areas during visits and audits.

  The process to declare competency of personnel is documented in the ISO9001:2000 procedure. This plan will be amended periodically in light of operational changes, learning experienced during its implementation and other activities that can affect the risk profiles.

- **Training Records**: Training can be done either in a written or verbal format but will be in an appropriate format for the receiving audience. Persons having received training must indicate in writing that they have indeed attended a training session and have been notified in detail of the contents and requirements of the EMPr. The attendance registers must be kept on file.

To ensure accountable and demonstrated implementation of the EMPr, a number of reporting systems, documentation controls and compliance mechanisms must be in place. **Table 6-2** indicates the minimum requirements as set out in the generic EMPrs for the development of overhead transmission and distribution infrastructure and for the development and expansion of substation infrastructure for the transmission and distribution of electricity.

Table 6-2 - Documentation Reporting and Compliance Requirements as per the generic EMPrs

Aspect	Refer to Generic EMPr (Part A)
Document control/Filing system	Section 4.1
Documentation to be available	Section 4.2
Weekly Environmental Checklist	Section 4.3
Environmental site meetings	Section 4.4
Required Method Statements	Section 4.5
Environmental Incident Log (Diary)	Section 4.6
Non-compliance	Section 4.7
Corrective action records	Section 4.8
Photographic record	Section 4.9
Complaints register	Section 4.10
Claims for damages	Section 4.11

Aspect	Refer to Generic EMPr (Part A)
Interactions with affected parties	Section 4.12
Environmental audits	Section 4.13
Final environmental audits	Section 4.14

Refer to: Part A, Section 4 of the Generic EMPr for the development and expansion of substation infrastructure for the transmission and distribution of electricity, attached as Appendix D and for the Development and Expansion for Overhead Electricity Transmission and Distribution Infrastructure attached as Appendix E.

6.3 MONITORING

The internal ESCO will monitor the day-to-day site activities on an ongoing basis and will produce weekly monitoring reports during construction. The independent, external ECO will undertake monthly audits to ensure compliance with the EMPr and conditions of the environmental authorisation during the construction activities and will report to the Site Manager should any non-compliance be identified or corrective action deemed necessary.

During the operational phase, the Holder of the EA will establish, implement and maintain a procedure to monitor and measure, on a regular basis, the key characteristics of the operations that may have a significant environmental impact. The procedure shall include the documenting of information to monitor performance, applicable operational controls and conformity with the operation's environmental objectives and targets.

The Holder of the EA will ensure that all instruments and devices used for the measurement or monitoring are calibrated and appropriately operated and maintained. Calibration records must be kept on site or in close proximity to the equipment for ease of availability.

All the conditions outlined in the EMPr (**Section 7**) will be subject to required internal day-to-day monitoring and external compliance monitoring. Where required, any specific additional monitoring has been outlined in the EMPr (**Section 7**).

6.4 NON-CONFORMANCE AND CORRECTIVE ACTION

The auditing of the construction and operational activities may identify non-conformances to the EMPr and conditions of the EA. Non-conformances may also be identified through incidents, emergencies or complaints recorded. In order to correct non-conformances, the source must be determined, and corrective actions must be identified and implemented.

6.4.1 COMPLIANCE WITH THE EMPR AND CONDITIONS OF THE ENVIRONMENTAL AUTHORISATION

- A copy of the EMPr and conditions of the environmental authorisation will be available onsite at all times for the duration of the construction and operational activities;
- All persons employed by a contractor or their sub-contractors will abide by the requirements of the EMPr and conditions of the environmental authorisation;
- Any members of the workforce found to be in breach of any of the specifications contained within the EMPr and conditions of the environmental authorisation may be ordered by the Site Manager to leave the site. A contractor will not direct a person to undertake any activity which would place

them in contravention of the specifications contained within the EMPr and conditions of the environmental authorisation;
- Should a contractor be in breach of any of the specifications contained in the EMPr and conditions of the environmental authorisation, the Site Manager will, in writing, instruct the contractor responsible for the incident of non-compliance regarding corrective and/or remedial action required, specify a timeframe for implementation of these actions, implement a penalty and/or indicate that work will be suspended should non-compliance continue;
- Should non-compliance continue, further written notification will be forwarded to the contractor responsible for the incident of non-compliance outlining the required corrective and/or remedial action, the timeframe for implementation, penalties and/or work will be suspended as specified previously; and
- Departmental officials will be given access to the property referred to in the EIR and EMPr for the purpose of assessing and/or monitoring compliance with the EMPr and conditions of the environmental authorisation, at all reasonable times.

6.4.2 SPOT FINES

The ESCO and ECO shall be authorised to impose spot fines for any of the transgressions detailed below:

- Littering on site;
- Lighting of illegal fires on site;
- Any persons, vehicles or equipment related to the contractor's operations found within the designated 'no-go' areas (especially for significant cultural resources such as nearby graves etc.);
- Creating excessive dust or excess noise emanating from site;
- Possession or use of intoxicating substances or weapons on site;
- Trapping, hunting or trading of fauna and / or plants on site;
- Any vehicles being driven in excess of designated speed limits;
- Any farm gates being left open;
- Unauthorised removal and/or damage to fauna, flora or cultural or heritage objects on site; and
- Urination and defecation anywhere other than using the toilet facilities that have been provided.

These activities, along with the appropriate guidelines to determining the fines, shall be agreed to by the Holder of the EA, the Site Manager and the Contractor. Such fines will be issued in addition to any remedial costs incurred as a result of non-compliance with the environmental specifications and or legal obligations. Igolide will inform the contractor of the contravention and the amount of the fine.

It is important to note that fines can be issued on an organisational level, as well as at an individual level. These fines will be paid to an organisation as discussed and agreed to by the Holder of the EA, Site Manager, Contractors, ESCO and ECO. Proof of payment is to be provided to the EO within 30 days of the fine being issued. Payment of a fine may not be subtracted from any moneys owed to the contractor by the client. A fine is not deemed a cost saver to the client but a measure to ensure that all construction activities are undertaken in a manner that reduces further environmental damage.

6.4.3 PENALTY FINES

Where environmental damage is caused or a pollution incident, and/or failure to comply with any of the environmental specifications contained in the EMPr, the Contractor shall be liable to pay a penalty fine. The following transgressions should be penalised:

- Hazardous chemical/oil spill;
- Damage to sensitive environments;
- Damage to cultural and historical sites;
- Unauthorised removal/damage to indigenous trees and other vegetation, particularly in identified sensitive areas;
- Uncontrolled/unmanaged erosion;
- Unauthorised blasting activities; and
- Violation of environmental authorisation conditions.

These activities, along with the appropriate guidelines to determining fines, shall be agreed to by the Holder of the EA, the Site Manager and Contractor. The fines will be calculated on a severity basis and imposed as per the merits of the case. In addition to penalties, the Site Manager has the power to remove from site any person who is in contravention of the EMPr, and if necessary, the engineer can suspend part of or all the works, as required.

6.4.4 DUTY OF CARE

Under Section 28 of the NEMA, all personnel involved with the construction and operational activities onsite will be responsible for implementing measures to prevent pollution or degradation of the environment from occurring, continuing or recurring. Failure to comply with the above conditions is a breach of the duty of care. If such harm is unavoidable, steps must be taken to minimise and rectify such pollution or degradation of the environment.

6.5 DOCUMENTATION AND REPORTING

The following documentation must be kept onsite in order to record compliance with the EMPr and conditions of the environmental authorisation:

- Record of complaints; and
- Record of emergencies and incidents.

The contractor will be required to report on the following:

- Environmental incidents involving contractor/ employees and/or the public;
- Environmental complaints and correspondence received from the public; and
- Incidents that cause harm or may cause harm to the environment.

The above records will form an integral part of the ESCO and ECO's reports and records thereof maintained for the duration of the project. These records will be kept with the EMPr and conditions of the EA, and will be made available for scrutiny if so requested by the Site Manager or his delegate, the ESCO and the ECO.

The contractor will ensure that the following information is recorded for all environmental complaints/incidents/emergencies:

- Date of complaint/incident/emergency;
- Location of complaint/incident/emergency;
- Nature of complaint/incident/emergency;
- Causes of complaint/incident/emergency;
- Party/parties responsible for causing complaint/incident/emergency;
- Immediate actions undertaken to stop/reduce/contain the causes of the complaint/incident/emergency;

- Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the complaint/incident/emergency;
- Timeframes and the parties responsible for the implementation of the corrective or remedial actions;
- Procedures to be undertaken and/or penalties to be applied if corrective or remedial actions are not implemented; and
- Copies of all correspondence received regarding complaints/incidents/emergency.

6.6 METHOD STATEMENTS

Before the contractor begins each construction activity, the contractor shall give to the ESCO and Site Manager a written Method Statement setting out the following:

- The type of construction activity;
- Locality where the activity will take place;
- Identification of impacts that might result from the activity;
- Identification of activities or aspects that may cause an impact;
- Methodology and/or specifications for impact prevention for each activity or aspect;
- Methodology and/or specifications for impact containment for each activity or aspect;
- Emergency/disaster incident and reaction procedures; and
- Treatment and continued maintenance of impacted environment.

The contractor must provide such information at least two weeks in advance of any or all construction activities for review and approval. Any changes made to the Method Statement after approval shall be given to the ESCO for review and the Site Manager for approval.

The ESCO and/or Site Manager may provide comment on the methodology and procedures proposed by the contractor but shall not be responsible for the contractor's chosen measures of impact mitigation and emergency/disaster management systems.

6.7 PUBLIC COMPLAINTS

The Contractor shall keep a Complaints Register on site to allow the general public to document any comments on or complaints regarding the activities of the site.

The Complaints Register must:

- Have numbered pages – any missing pages must be accounted for by the Contractor;
- Be tabled during monthly site meetings;
- Be made available to the SE/Contract Manager, the ECO, the Project Company, and/or any authority at any time if requested; and
- Include a section for the documentation of the action taken to address the complaint.

All complaints must be investigated, responded to, and recorded in the Complaints Register within 28 calendar days.

A generic grievance mechanism is detailed in **Section 9.15**.

7 GENERIC ENVIRONMENTAL CONTROLS

This section refers to construction related activities that are common to the development of the substations associated with Igolide WEF as defined within the pre-approved generic EMPrs. For each activity, a set of prescribed environmental controls and associated management actions have been identified. Contractors shall implement these controls as a minimum requirement for mitigating the impact of particular construction related activities.

These control measures are defined within Part B: Section 1 of the pre-approved generic EMPrs (attached as **Appendix D** and **Appendix E**). The format of a general environmental control is shown below, see **Table 7-1**. The boxes shaded in green are predefined and represent minimum standards for the management of that particular aspect. The Contractor will be required to adhere to all impact management actions (where applicable to the construction related activity) for the Project. The boxes shaded in red assign responsibility for the implementation and monitoring of the impact management actions. This implementation and monitoring information is project specific and shall be completed by the Contractor prior to commencement of construction.

Table 7-1 – Format of a general environmental control illustrating aspects which are predefined versus those which still need to be completed by the contractor

Management Objective:	Predefined as part of Generic EMPr					
Management Outcome:	Predefined as part of Generic EMPr					
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
Predefined as part of Generic EMPr	To be completed by Contractor	To be completed by Contractor	To be completed by Contractor	To be completed by Contractor	To be completed by Contractor	To be completed by Contractor

The completed template must be signed and dated on each page by both the contractor and the holder of the EA prior to commencement of the activity. The method statements must prepared and agreed to by the holder of the EA, prior to commencement, and must be appended to the template. Each method statement must also be duly signed and dated on each page by the contactor and the holder of the EA. This template, once signed and dated, is legally binding. The holder of the EA will remain responsible for its implementation.

The construction related activities addressed within Part B: Section 1 of the pre-approved generic EMPrs are as follows:

Table 7-2 - Activities and management measures as per generic EMPr (Part B: Section 1)

Activity	Refer to Generic EMPr for the development and expansion of substation infrastructure, attached as Appendix D (Part B: Section 1)	Refer to Generic EMPr for the development of overhead transmission and distribution infrastructure, attached as Appendix E (Part B: Section 1)
Environmental awareness training	5.1	5.1
Site Establishment development	5.2	5.2
Access restricted areas	5.3	5.3
Access roads	5.4	5.4
Fencing and Gate installation	5.5	5.5
Water Supply Management	5.6	5.6
Storm and wastewater management	5.7	5.7
Solid and hazardous waste management	5.8	5.8
Protection of watercourses and estuaries	5.9	5.9
Vegetation clearing	5.10	5.10
Protection of fauna	5.11	5.11
Protection of heritage resources	5.12	5.12
Safety of the public	5.13	5.13
Sanitation	5.14	5.14
Prevention of disease	5.15	5.15
Emergency procedures	5.16	5.16
Hazardous substances	5.17	5.17
Workshop, equipment maintenance and storage	5.18	5.18
Batching plants	5.19	5.19
Dust emissions	5.20	5.20

Activity	Refer to Generic EMPr for the development and expansion of substation infrastructure, attached as Appendix D (Part B: Section 1)	Refer to Generic EMPr for the development of overhead transmission and distribution infrastructure, attached as Appendix E (Part B: Section 1)
Blasting	5.21	5.21
Noise	5.22	5.22
Fire prevention	5.23	5.23
Stockpiling and stockpile areas	5.24	5.24
Finalising tower positions	Not applicable to a Solar PV facility	5.25
Civil works	5.25	5.25
Excavation (and Installation) of foundations	5.26	5.26
Installation of foundations, cable trenching and drainage systems	5.27	5.27
Assembly and erecting towers	Not applicable to a Solar PV facility	5.27
Installation of equipment (circuit breakers, current Transformers, Isolators, Insulators, surge arresters, voltage transformers, earth switches)	5.28	5.28
Stringing (and cabling)	5.30	5.28
Testing and Commissioning (all equipment testing, earthing system, system integration)	5.31	5.31
Socio-economic	5.32	5.29
Temporary closure of site	5.33	5.30
Dismantling of old equipment	5.34	5.34
Landscaping and rehabilitation	5.35	5.31

Refer to: Part B – Section 1 of the Generic EMPr for the development and expansion of substation infrastructure for the transmission and distribution of electricity, attached as Appendix D and Part B – Section 1 of the Generic EMPr for the development of overhead transmission and distribution infrastructure, attached as Appendix E.

8 SITE SPECIFIC ENVIRONMENTAL CONTROLS

The EMPr contains guidelines, operating procedures, rehabilitation and pollution control requirements which will be binding to the onsite personnel working for, or on behalf of Igolide WEF. It is essential that the EMPr be carefully studied, understood, implemented and adhered to at all times.

In instances where the method statements provided by the contractor conflict with the EMPr, such conflicts will be discussed between the Site Manager, ESCO, ECO and contractor and if unresolved the EMPr will take precedent.

The EMPr identifies various actions which are undertaken throughout the construction and operational phases of the Igolide WEF. Not every action will be required during the entire course of activities. Therefore, the actions identified in the EMPr have been given priority timeframes for proposed implementation. The columns in the structure of the EMPr have been described **Table 8-1** below.

Table 8-1 – Structure of EMPr

Column	Description
Activity/Aspect	Highlights the various activities/aspects associated with the project i.e. the contractors' activities that will interact with the environment.
Impact Management Outcome	The desired outcomes from effectively minimising negative impacts and/or enhancing positive impacts.
Impact Management Actions/Measures	Indicates the actions required to prevent and /or minimise the potential impacts on the environment that are associated with the project.
Indicator and Compliance Management	Items that will assist with determining compliance against management actions.
Responsibility	Indicates the party responsible for implementing the environmental measures and action plans laid out in the EMPr. Please note that the Site Manager will have authority to stop works if/as necessary.
Priority Timeframe	Indicates when the actions for the specific aspect must be implemented and/or monitored.

Table 8-2 – Contractor laydown area and site access: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
8.1 CONTRACTOR LAYDOWN AREA AND SITE ACCESS			
Impact Management Outcome: ▪ To implement measures to minimise impacts on the environment from the initiation of construction activities through planning, careful site access route selection and implementation of mitigation measures.			
Indicator and Compliance Mechanism: ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Close-out on incidents. ▪ Monitoring and audit reports. ▪ Induction training and register. ▪ Environmental awareness programme/toolbox talks.			
Project Initiation of Construction Activities	Appoint an ECO to manage and verify compliance with the EA and EMPr.	▪ Holder of the EA ▪ Project Manager ▪ EO ▪ Contractor (Site Manager)	▪ Pre-Construction ▪ Construction ▪ Decommissioning
	The development footprint must be demarcated to ensure that only the demarcated areas are impacted upon. The no-go areas identified must be demarcated before the construction or decommissioning commences. This includes all wetlands and the associated buffers, and any high sensitivity areas as indicated in **Figure 4-1**. Label these areas as environmentally sensitive areas, keep out.		
	Contractor laydown areas, vehicle re-fuelling areas and material storage facilities to remain outside of the delineated freshwater ecosystems and the associated NEMA 32m.		
	All personnel and contractors to undergo Environmental Awareness Training, including awareness of the surrounding area and wetlands to inform importance of these areas and their conservation. A signed register of attendance must be kept		▪ Construction ▪ Operation

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	for proof.		
	Site clearing must be limited to the footprint of the infrastructure requirements.		▪ Construction
	Locate firefighting measures at laydown areas and vehicles, such as fire extinguishers, and make personnel aware of fire prevention and firefighting measures.		
	Firefighting equipment must be securely placed and inspected monthly.		

Table 8-3 – Vehicle, Equipment and Machinery Management: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
8.2 VEHICLE, EQUIPMENT AND MACHINERY MANAGEMENT			
Impact Management Outcome: ▪ To implement measures to minimise impacts on the environment from poorly maintained equipment, machinery and vehicles onsite.			
Indicator and Compliance Mechanism: ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Close-out on incidents. ▪ Monitoring and audit reports. ▪ Transport route delineation. ▪ Daily equipment, machinery and vehicle checklists. ▪ Incident classification and reporting procedure.			
Operation of Equipment, Machinery and Vehicles	Ensure that the equipment, machinery and vehicles are adequately maintained so as to: ▪ Reduce the potential for spillages of oil, diesel, fuel or hydraulic fluid. ▪ Ensure road-worthiness. ▪ Reduce emissions. Evidence of such maintenance must be recorded and maintained onsite for verification.	▪ EO ▪ ESCO / ECO ▪ Contractor	▪ Construction ▪ Operation ▪ Decommissioning
	Maintenance vehicles should stick to demarcated roads as far as practically possible to minimise soil compaction on adjacent soils.		
	The movement of vehicles into and out of the site must be managed to ensure the impact on public areas is minimised, such as ensuring that abnormal loads are moved outside of peak traffic hours, and reasonable measures are taken to ensure that public and staff safety is managed adequately.		

Table 8-4 – Fuel and Chemical Management: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
8.3 FUEL AND CHEMICAL MANAGEMENT			
Impact Management Outcome: ▪ To ensure the correct storage, handling and disposal of fuels and chemicals in order to prevent impacts to the surrounding environment.			
Indicator and Compliance Mechanism: ▪ Maintenance records. ▪ Safe disposal certificates (if applicable). ▪ Material safety data sheets (MSDS). ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Chemicals management procedure (to be developed). ▪ Monitoring and audit reports. ▪ Training records.			
Fuel and Chemical Management	Provide secure storage for fuel, oil, chemicals and other hazardous materials. Securely fence and lock the storage areas to accommodate all hazardous substances such as fuel, oils and chemicals. The storage area must be roofed and the floor must be an impermeable surface and suitably bunded as per the requirements outlined in South African National Standard (SANS) 10089-1 (2008). If storage capacity triggers licencing, those must be acquired.	▪ EO ▪ ESCO / ECO ▪ Contractor	▪ Construction ▪ Operation
	Indicate the location of the fuel and chemical storage area on the layout plans.		
	Label all liquids (chemicals and hydrocarbons) stored onsite for easy identification. MSDS for onsite chemicals, hydrocarbon materials and hazardous substances must be readily available. MSDS must include mitigation measures to ameliorate potential environmental impacts which may result from a spill, incorporating health and safety mitigation measures.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	A spill management plan must be in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use.		
	No servicing of equipment on site unless necessary. All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers for safe disposal.		
	In cases where a surface leak occurs during loading and off-loading activities, the spill material will be cleaned using a spill kit.		
	Leaking equipment and vehicles must be repaired immediately or be removed from project area to facilitate repair		
Health and Safety	Display “no smoking” and “no naked flame” signs in and around the project area, as well as near the hazardous material store.	▪ EO ▪ ESCO / ECO ▪ Contractor	▪ Construction ▪ Operation
	Strategically place the correct types of fire extinguishers onsite and near the hazardous material store. Train key personnel on basic firefighting skills		
	Frequently inspect and maintain containment facilities and retain records onsite.		

Table 8-5 – Waste Management: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
8.4 WASTE MANAGEMENT			
Impact Management Outcome: ▪ To ensure the correct handling, storage, transportation and disposal of general waste and hazardous waste.			
Indicator and Compliance Mechanism: ▪ Induction training and records. ▪ Waste Management Plan (WMP). ▪ Relevant SANS Codes of Practice. ▪ Waste manifests and safety disposal certificates (all waste streams). ▪ Emergency preparedness and response procedure. ▪ Incident classification and reporting management procedure (to be developed). ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Monitoring and audit reports.			
General Waste Management	General waste generated as a result of construction and operational activities must be managed in accordance with a WMP (See Generic WMP in Section 9.2).	▪ EO ▪ ESCO / ECO ▪ Contractor	▪ Construction ▪ Operation ▪ Decommissioning
	Train and inform all onsite personnel regarding general waste minimisation, management and disposal as per the WMP.		
	Prohibit littering, burning and burying of waste onsite.		
	Place an adequate number of labelled or colour coded general waste bins around the laydown area and at the construction sites during construction activities in order to minimise littering. The bins must be removed from the site on a regular basis for disposal at a registered or licensed disposal facility.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site.		
	Refuse bins shall be emptied daily (or as required) and secured.		
	Temporary storage of domestic waste shall be in covered waste skips.		
	Maximum domestic waste storage period shall be 10 days.		
	Retain records such as waybills and waste manifests associated with waste removal, transportation and disposal (safe disposal certificates).		
	Prohibit the mixing of general waste with hazardous waste. Should general waste be mixed with hazardous waste, it will be considered hazardous waste. There should be waste segregation (e.g. electronic equipment, chemicals, oil contaminated rags, paper, plastic) and management on the site.		
	Recover, recycle and reuse general waste as far as possible.		
Hazardous Waste Management	Hazardous waste generated as a result of construction, operational and decommissioning activities must be managed in accordance with a WMP that is aligned to South African National Standard (SANS) 10234: Classification and Labelling of Chemicals − SANS 10228: The Identification and Classification of Dangerous Substances − SANS 10229: Packing of Dangerous Goods for Road and Rail Transportation.	▪ ESCO / ECO ▪ EO ▪ Contractor	▪ Construction ▪ Operation ▪ Decommissioning
	The WMP must include a procedure for handling spillages.		
	Strict use and management of all hazardous materials used on site.		
	Strict management of potential sources of pollution (e.g. litter, hydrocarbons from		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	vehicles & machinery, cement during construction, etc.) within demarcated / bunded areas.		
	Train and inform all onsite personnel regarding hazardous waste minimisation, management and disposal as per the WMP.		
	A designated and appropriately demarcated and covered hazardous waste storage area must be established on a hard standing area.		
	Ensure that all hazardous wastes temporarily stored on site are stored in a covered skip and are placed on a hard standing.		
	Clean areas where hazardous waste spills have occurred and dispose of the hazardous material appropriately. Key personnel must be trained on handling spillages.		
	Retain records of appropriate safety disposal certificates associated with hazardous waste removal, transportation and disposal.		
	An emergency preparedness and response plan is to be developed by the contractor/operator for any hazardous waste being removed, transported and disposed of offsite.		
	Ensure that waste manifest documentation (as per the Waste Classification and Management Regulations – GNR 634) is prepared and maintained for the generation, transportation and disposal of waste.		
	All spills should be reported to the authorities as per the emergency preparedness and response frequencies / specifications.		

Table 8-6 – Health and Safety: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
8.5 HEALTH AND SAFETY			
Impact Management Outcome: ▪ To ensure communication with members of the public to promote safety awareness. ▪ To prevent public access to construction sites and storage areas. ▪ To ensure safety for all onsite personnel.			
Indicator and Compliance Mechanism: ▪ Induction training and records. ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Monitoring and audit reports. ▪ Incident classification and reporting management procedure (to be developed). ▪ PPE Register. ▪ Occupational health and safety plan (to be developed). ▪ Health and safety protocol (to be developed).			
Health and Safety	The construction phase will be managed according to all the requirements of the Occupational Health and Safety Act 85 of 1993, specifically the Construction Regulations.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction ▪ Operation
	All onsite personnel are required to undergo induction training and regular toolbox talks in order to raise awareness of the conditions contained herein.		
	Development and implementation of an occupational health and safety plan and Safety Health Environment Risk & Quality (SHERQ) policy.	▪ Contractor/Operator ▪ Site Manager	▪ Construction ▪ Operation
	The appointed contractor will be responsible for the development of a comprehensive health and safety protocol which must be adhered to.	▪ Contractor	▪ Construction

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	Emergency response plan to be in place prior to beginning construction and to include aspects such as appointment of emergency controller, provision of first aid, first responder contact numbers.		
	Provide and wear appropriate PPE onsite.	▪ Contractor/Operator ▪ Site Manager	▪ Construction ▪ Operation
	All normal procedures for working at heights, hot work permits, confined space entry, cordon off excavations etc to be in place before construction begins.	▪ Contractor/Operator ▪ Site Manager	▪ Construction ▪ Operation
	All necessary good hygiene practices to be in place, e.g. provision of toilets, eating areas, infectious disease controls.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction ▪ Operation
	Policies and practice for dealing with known vectors of disease such as Aids, TB, COVID 19 and others.		
	Prior to construction, determine the dangerous species in the area and what responses are needed to bites/exposure/attacks.		
	Train all onsite personnel handling chemical or hazardous substances in the use of such substances and the environmental, health and safety consequences of incidents.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction ▪ Operation
	Outside work must be stopped during thunderstorms. Lighting conductors may be required for the final installation, to be confirmed during design phase.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction ▪ Operation
Facility emergencies	Emergency response plan for full operation and maintenance phase to be in place prior to beginning commissioning and to include aspects such as: ▪ appointment of emergency controller,	▪ Operator	▪ Operation

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ emergency isolation systems for electricity, ▪ emergency isolation and containment systems for electrolyte, ▪ provision of PPE for hazardous materials response, ▪ provision of emergency facilities for staff at the main office building, ▪ provision of first aid facilities, ▪ first responder contact numbers etc		
	A detailed risk assessment of all normal operating and maintenance activities on site to be compiled, and form the basis of operating instructions, prior to commencing commissioning.	▪ Operator	▪ Operation
	Material Safety Data Sheets (MSDSs) must be made available for all chemicals and substances on site.	▪ Site Manager ▪ Contractor ▪ Operator ▪ ESCO / ECO ▪ EO	▪ Construction ▪ Operation
Fire risk	Full Process Safety Management system with all elements to be implemented to highest international best practice levels.	▪ Site Manager ▪ Contractor ▪ Operator ▪ ESCO / ECO ▪ EO	▪ Construction ▪ Operation
	Suitable fire-fighting equipment on site near source of fuel, e.g. diesel tank, generators, mess, workshops etc.		
	Safety integrity level rating of equipment (failure probably) with suitable redundancy if required.		
	Ensure regular testing of emergency alarm systems are undertaken.		
	Emergency Response plan in compliance with SANS 1514 to be compiled, e.g. plan from transport and construction phase to be extended to operational phase to include the hazards of the systems containing large quantities of highly hazardous chemicals.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
Public Safety	Restrict public access by employing full time security for the site.	▪ Site Manager ▪ ESCO / ECO ▪ EO	▪ Construction ▪ Operation
Decommissioning of facility	End of Life shutdown procedure including a risk assessment of the specific activities involved.	▪ Operator ▪ ESCO / ECO ▪ EO	▪ Decommissioning
	Re-purpose the equipment with associated environmental impact considered.		
	Disposal according to local regulations and other international directives.		
	Operator should seek the opinion from a waste consultant on how to correctly dispose of hazardous waste.		
BESS	The construction phase will be managed according to all the requirements of the Occupational Health and Safety Act No. 85 of 1993, specifically the Construction Regulations.	▪ Site Manager ▪ Contractor ▪ Developer ▪ ESCO / ECO ▪ EO	▪ Pre-Construction ▪ Construction
	SHEQ policy in place.		
	A detailed construction Risk Assessment prior to work.		
	SHE procedure in place.		
	PPE to be specified.		
	SHE appointees in place.		
	Contractor's safety files in place and up to date.		
	All necessary health controls/ practices to be in place, e.g., ventilation of welding and painting areas.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	SHE monitoring and reporting programs in place.		
	Emergency response plan to be in place prior to beginning construction and to include aspects such as appointment of emergency controller, provision of first aid, first responder contact numbers.		
	Health Risk Assessment to determine if equipment noise exceeds 85dB at workstation and 61dB at boundary of the site.		
	Employees to be provided with hearing protection if working near equipment that exceeds the noise limits.		
	Construction site facilities to comply with Occupational Health and Safety Act No. 85 of 1993, specifically the thermal, humidity, lighting and ventilation requirements of the Environmental Regulations for Workplaces.		
	Adequate potable water for employees to be provided during all phases of the project. Borehole, bowser and tank or small water treatment plant may be required to provide potable water for the BESS installation staff during all phases of the project.		
	Training in lifting techniques.		
	Ensure that despite the isolated location all the necessary equipment is available (and well maintained) during construction. Otherwise employees may revert to unsafe practices. Isolated location, maintenance of construction equipment to ensure safe operation is critical. Ensure this is in place prior to project beginning.		
	Fuels stored on site in dedicated, demarcated and bunded areas.		
	Suitable fire-fighting equipment on site near source of fuel, e.g., diesel tank, generators, mess, workshops etc.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	Solid state battery design includes abuse tests such as drop test, impact, rapid discharge etc. Propagation tests for systems, e.g., heat insulating materials between cells/modules. Factory acceptance test prior to prior to leaving manufacture. Batteries are usually stored at 50% charge to prolong life but may be shipped fully discharged. This level of detail should be understood to assess the risk during transport and storage.		
	The company responsible for the battery installation should ensure suitably competent transport companies are appointed.		
	Prior to bringing any containers into the country, the company responsible for the battery installation (possibly via appointed contractors) should ensure that an Emergency response plan is in place for the full route from the ship to the site. Drivers trained in the hazards of containerized batteries.		
	All necessary good hygiene practices to be in place, e.g., provision of toilets, eating areas, infectious disease controls.		
	Policies and practice for dealing with known vectors of disease such as Aids, TB, COVID 19 and others.		
	Awareness training for persons on site, safety induction to include animal hazards.		
	First aid and emergency response to consider the necessary anti-venom, anti-histamines, topical medicines etc.		
	Due to isolated locations some distance from town, the ability to treat with anti-venom and extreme allergic reactions on site is critical to mitigate the impacts		
	Appointed transport company to ensure transport in accordance with Regulation 8 of the National Road Traffic Act 93 of 1996, Dangerous Goods. Not permitted to transport prescribed goods in manner not consistent with the prescriptions, e.g., consignor and consignee responsibilities. Prescription found in SANS 10228/29		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	and international codes for battery transport etc.		
	Transport in sealed packages that are kept upright, protected from movement damage etc.		
	Also packaged to ensure no short-circuiting during transport.		
	Transport to prevent excessive vibration considerations as battery internal may be damaged leading to thermal run-away during commissioning.		
	Pre-assembled containers will most likely be supplied. These will be fitted with the necessary protective measures by the supplier considering marine and road transport as well as lifting, setting down etc.		
	Route selection to consider possible incidents along the way and suitable response, e.g., satellite tracking, mobile communication, 24/7 helpline response.		
	Standard dangerous goods requirements for Hazmat labels, Trem cards, driver trained in the hazards of the load.		
	There will be packaging materials that will need to be disposed of after the entire system is connected and commissioned as well as after regular maintenance.		
	There will need to be waste segregation (e.g., electronic equipment, chemicals) and management on the site.		
	Water usage to be monitored on site during construction.		
	Handling protocols to be provided by battery supplier.		
	End of Life plan needs to be in place before any battery containers enter the country as there may be damaged battery unit from day 1.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	Water management plan and spill containment plans to be in place.		
	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 to be provided both indoors and outdoors where necessary.		
	If batteries are stored at 50% charge, thermal run away can happen while in storage on site waiting for installation. In addition, if involved in an external fire thermal run away can happen even with uncharged batteries. Except during shipping, ideally the units should not be stored any closer to each other than they would be in the final installation so that propagation is prevented, i.e. laydown area needs to be considered.		
	The company in charge of the containers at each stage in the transport process needs to be very clear so that responsibility for the integrity of the load and protection of the persons involved in transfer and coordination of emergency response on-route. E.g., if purchased from Tesla where does hand over occur to the South African contractor / owner, at the factory door in USA, at the port in RSA, at the site fence. For example, who will be accountable if there's thermal runway event on a truck with a container that stops in a small town for driver refreshments.		
	Use only internationally reputable battery suppliers who comply with all known regulations/guideline at the time of purchasing.		
	Ensure only state of the art battery systems are used and not old technologies prone to fires/explosions etc.		
	The operation and maintenance phase will be managed according to all the requirements of the Occupational Health and Safety Act 85 of 1993.	▪ Operator	▪ Operational

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	A detailed Risk Assessment of all normal operating and maintenance activities on site to be compiled, and form the basis of operating instructions, prior to commencing commissioning.		
	All necessary health controls/ practices to be in place, e.g., ventilation of confined areas, occupational health monitoring if required and reporting programs in place.		
	Emergency response plan for full operation and maintenance phase to be in place prior to beginning commissioning		
	Maintenance procedures will be in place should equipment need to be opened, e.g., pumps drained and decontaminated prior to repair in workshop etc.		
	PPE will be specified for handling battery parts and other equipment on site.		
	Training of staff in hazards of chemicals on site.		
	Possible detectors with local alarms if regulated occupational exposure limits are exceeded etc prior to entry for inspection of battery containers.		
	Labelling of all equipment.		
	Confined space entry procedures if entering tanks.		
	There needs to be careful thought given to procedures to be adopted before entering into the BESS or a container particularly after a BMS shut down where there may be flammable or toxic gases present, a fire etc.		
	Safety Data Sheets (SDSs) to be available on site.		
	Operating manuals to be provided including start-up, shut-down, steady state, monitoring requirements.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	Maintenance manuals with make safe, decontamination and repair procedures.		
	Proposed maintenance schedules e.g., checklists for weekly, monthly, annual etc.		
	Provided portable equipment for calibration and for testing/verification of defective equipment, e.g., volt/current meters, infrared camera		
	Ensure containers are temperature controlled as required to remain within the optimal battery operating temperature range.		
	Lighting to be provided inside any buildings, inside the containers, possibly linked to the door opening and outdoors where necessary.		
	Adequate potable water to be provided during all phases of the project.		
	Suitable lighting to be provided including emergency lighting for safe building exit in the event of power failure.		
	PPE for operations and maintenance staff to be suitable for the weather conditions.		
	Staff rotation to other activities within the site may be necessary.		
	Performance monitoring of inspections / maintenance tasks in particular will be necessary.		
	Working at height procedure to be in place.		
	Grass cutting and fire breaks around the BESS installations to prevent veld fires. No combustible materials to be stored in or near the batteries or electrical infrastructure. Separation of site diesel tank, transformers from BESS and vice versa.		
	There are BESS design codes from the USA and standards of practice that can be		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	used e.g., UL9540, NFPA 855 and DNV GL RP 43.		
	Detailed FMEA/Hazop/Bowtie to done during design at the component level and system levels. Safety integrity level rating of equipment (failure probably) with suitable redundancy if required. Site Acceptance Testing as part of commissioning of each unit and the overall system. Abuse tests conducted by supplier.		
	BMS should be checking individual cell voltage as well as stack, module, container, system voltages/current etc. BMS tripping the cell and possibly the stack/ building unit or module/rack/container, if variations in voltage. Diagnostics easily accessible. Diagnostics able to distinguish cell from stack or cell from module faults. Protective systems are only as good as their reliability and functionality testing is important, e.g., testing that all battery trips actually work. Fire resistant barrier between the batteries and the PCS side if in the same container, or separate containers.		
	Suitable ingress protection level provided for electrical equipment, e.g., IP55 - 66. If air cooling into container, suitable dust filters to be provided. Smoke detectors linked to BMS & alerts in control room.		
	Effects of battery aging to be considered. Solid state battery life starts to be impacted above 40 °C and significant impacts above 50 °C with thermal run away starting at 65-70 °C. BMS trips system at 50 °C. Temperature monitoring to be in place. Regular infrared scanning. Data needs to be stored for trend analysis.		
	Data indicates an event frequency of 0.001 per installation and with up to 200 units this would mean an event once 5 years, i.e. a high probability event. Most events will be small not resulting in injuries, but this is possible if the event is not controlled.		
	Prior to commencement of cold commissioning, emergency plan from transport and construction phase to be extended to operational phase and to include the hazards of the electrically live system. Procedure to address solid state container fires - extinguishing, ventilating, entering as appropriate or not. PPE for container		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	firefighting include fire retardant, chemically resistant, nitrile gloves, antistatic acid resistant boots, fill face shields, BA sets.		
	A planned fire response to prevent escalation to an explosion or an environmental event.		
	Suitable supply of fire extinguishing medium and cooling medium		
	Consider fire water for cooling adjacent equipment – BESS units.		
	Can use fogging nozzles to direct smoke.		
	Ensure procedures in place for clean up after event Lingering HF and other toxic residues in the soil and on adjacent structures.		
	Procedures to be in place for IR scanning (or other suitable method) to determine if batteries are still smouldering / are sufficient cooled to handle as batteries may still be active some weeks after an event.		
	Smoke or gas detector systems that are not part of the original battery container package, need to be linked to the main control panel for the entire system so that issues can be detected and responded to rapidly..		
	Grass cutting and fire breaks around the BESS installations to prevent veld fires. No combustible materials to be stored in or near the batteries or electrical infrastructure. Separation of site diesel tank, transformers from BESS and vice versa.		
	There are BESS design codes from the USA and standards of practice that can be used e.g., UL9540, NFPA 855 and DNV GL RP 43.		
	Detailed FMEA/Hazop/Bowtie to done during design at the component level and system levels. Safety integrity level rating of equipment (failure probably) with		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	suitable redundancy if required. Site Acceptance Testing as part of commissioning of each unit and the overall system. Abuse tests conducted by supplier.		
	BMS should be checking individual cell voltage as well as stack, module, container, system voltages/current etc. BMS tripping the cell and possibly the stack/ building unit or module/rack/container, if variations in voltage. Diagnostics easily accessible. Diagnostics able to distinguish cell from stack or cell from module faults. Protective systems are only as good as their reliability and functionality testing is important, e.g., testing that all battery trips actually work. Fire resistant barrier between the batteries and the PCS side if in the same container, or separate containers.		
	Suitable ingress protection level provided for electrical equipment, e.g., IP55 - 66. If air cooling into container, suitable dust filters to be provided. Smoke detectors linked to BMS & alerts in control room.		
	Effects of battery aging to be considered. Solid state battery life starts to be impacted above 40 °C and significant impacts above 50 °C with thermal run away starting at 65-70 °C. BMS trips system at 50 °C. Temperature monitoring to be in place. Regular infrared scanning. Data needs to be stored for trend analysis.		
	Data indicates an event frequency of 0.001 per installation and with up to 200 units this would mean an event once 5 years, i.e. a high probability event. Most events will be small not resulting in injuries, but this is possible if the event is not controlled.		
	Prior to commencement of cold commissioning, emergency plan from transport and construction phase to be extended to operational phase and to include the hazards of the electrically live system. Procedure to address solid state container fires - extinguishing, ventilating, entering as appropriate or not. PPE for container firefighting include fire retardant, chemically resistant, nitrile gloves, antistatic acid resistant boots, fill face shields, BA sets.		
	A planned fire response to prevent escalation to an explosion or an environmental		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	event.		
	Suitable supply of fire extinguishing medium and cooling medium		
	Consider fire water for cooling adjacent equipment – BESS units.		
	Can use fogging nozzles to direct smoke.		
	Ensure procedures in place for clean up after event Lingering HF and other toxic residues in the soil and on adjacent structures.		
	Procedures to be in place for IR scanning (or other suitable method) to determine if batteries are still smouldering / are sufficient cooled to handle as batteries may still be active some weeks after an event.		
	Undertake a hazardous area classification of the inside of the container to confirm the rating of electrical equipment, due to possible leaks of electrolyte or generation of flammable gases under thermal run away. Emergency response plan and employee training referred to above is critical.		
	Suitable training of selected emergency responders who may be called out to the facilities is critical.		
	Apart from pumps, no major moving parts during operation.		
	Maintenance equipment to be serviced and personnel suitably trained in the use thereof.		
	Normally just small vehicles on site, bakkies, grass cutting, cherry-pickers etc. Possibly large cranes if large equipment or elevated structure removed/replaced.		
	Traffic signs, rules etc. in place on site.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	All normal working at heights, hot work permits, confined space entry, cordon off unsafe areas/works etc. to be in place.		
	Emergency response plan.		

Table 8-7 – Air quality: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
8.6 AIR QUALITY			
Impact Management Outcome: ▪ To ensure that impacts to air quality of the surrounding environment are minimised.			
Indicator and Compliance Mechanism: ▪ Complaints register. ▪ Incident reporting system. ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Incident classification and reporting management procedure (to be developed). ▪ Equipment, machinery and vehicle maintenance.			
Dust Management	Before the commencement of any site works and during the operation, as much vegetation as possible must be retained, including patches and strips to minimise dust.	▪ EO ▪ ESCO / ECO ▪ Contractor	▪ Construction ▪ Operation
	Activities with high dust-causing potential, such as grading and moving of soil, must not be carried out in sensitive areas during adverse wind conditions.		▪ Construction
	All stockpiles (if any) must be restricted to designated areas and may not exceed a height of two (2) metres.		
	Earth-moving works have the potential to generate large amounts of dust. Pre-planning of earth-moving works can reduce dust emissions by limiting the time the site is exposed. Options for dust control can include the following: ▪ Plan earth-moving works so that they are completed just prior to the time they are needed ▪ Observe weather conditions and do not commence or continue earth moving		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	works if conditions are unsuitable e.g., under conditions of strong winds ■ Reduce off-site hauling via balanced cut and fill operations ■ Pre-water areas to be disturbed		
	Cover and/or maintain appropriate freeboard on trucks hauling any loose material that could produce dust when travelling. Minimise transfer points.		
	Re-vegetate disturbed areas as soon as possible to prevent excessive dust from occurring.		
	Once construction is complete, initiate rehabilitation (e.g. re-vegetation) procedures to reduce wind speed across exposed surfaces.		
	Dampen exposed soil to suppress dust if required. Use watering sprays on materials to be loaded and during loading.		
	Where possible, minimise speed limits, vehicle weights and the number of vehicles using unpaved roads.		

Table 8-8 – Noise: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
8.7 NOISE			
Impact Management Outcome: ▪ To ensure that noise impacts to the surrounding environment are minimal or mitigated.			
Indicator and Compliance Mechanism: ▪ Complaints register. ▪ Incident reporting system. ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Incident classification and reporting management procedure (to be developed). ▪ Equipment, machinery and vehicle maintenance.			
Noise	Applicant to re-evaluate the noise impact should the applicant make use of a wind turbine with a maximum SPL exceeding 109.0 dBA re 1 pW	▪ Applicant/ECO	▪ Planning phase
	Applicant to re-evaluate the noise impact once the WTG specifications are finalised, and should the WTG layout be revised as part of an amendment process post EA. If noise modelling indicates noise levels exceeding 45 dBA at verified NSR (where the structures are used for permanent residential activities), the applicant must design a NAP (or appropriate mitigation measures) that will ensure that operational noise levels are less than 45 dBA at all potential NSR.		
	Applicant to design and implement noise monitoring programme to define current ambient sound levels at selected NSR before the construction phase starts.		
	Engineering, procurement and construction (EPC) contractor to ensure that equipment is well maintained and fitted with the correct and appropriate noise abatement measures.	▪ EPC contractor / ECO	▪ Construction
	Health & Safety (“H&S”) agent/ ECO to include a component covering environmental noise in the Health and Safety Induction to sensitize all employees	▪ H&S Agent/ ECO	▪ Construction

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	and contractors about the potential impact from noise.		
	EPC contractor (responsible person to be defined by client) to notify NSR before night-time construction activities are to take place within 1,000 m from NSR (if the structures are used for residential activities during the proposed construction period).	▪ EPC contractor/ ECO	▪ Construction (activities within 1500m from NSR, if NSR is used for residential purposes)
	Facility manager to conduct noise monitoring when a reasonable and valid noise complaint is received from an NSR living within 2,000 m from a WTG of the project.	▪ Contractor/ Operator/ Facility Manager	▪ Operation: Within 2 months after a noise complaint is registered
	Noise monitoring to confirm that noise levels associated with operating WTG are less than 45 dBA at all NSR.	▪ Contractor/ Operator/ Facility Manager	▪ Operation: During the first year. Noise specialist to confirm need for future measurements

Table 8-9 – Soil, Land Use and Agriculture: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
8.8 SOIL, LAND USE AND AGRICULUTURE			
Impact Management Outcome: ▪ To prevent any disturbance, erosion or contamination of soil resources.			
Indicator and Compliance Mechanism: ▪ Induction training and records. ▪ WMP (to be developed). ▪ Incident classification and reporting management procedure (to be developed). ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Monitoring and audit reports. ▪ Stormwater Management Plan (SWMP) (to be developed).			
Soil and Land Management	A system of storm water management, which will prevent erosion on and downstream of the site, will be an inherent part of the engineering on site. Any occurrences of erosion must be attended to immediately and the integrity of the erosion control system at that point must be amended to prevent further erosion from occurring there.	▪ Site Manager ▪ Contractor ▪ Developer ▪ ESCO / ECO ▪ EO	▪ Pre-Construction
	Any excavations done during the construction phase, in areas that will be re-vegetated at the end of the construction phase, must separate the upper 30 cm of topsoil from the rest of the excavation spoils and store it in a separate stockpile. When the excavation is back-filled, the topsoil must be back-filled last, so that it remains at the surface. Topsoil should only be stripped in areas that are excavated. Across the majority of the site, including construction lay down areas, it will be much more effective for rehabilitation, to retain the topsoil in place. If levelling requires significant cutting, topsoil should be temporarily stockpiled and then re-spread after cutting, so that there is a covering of topsoil over the entire cut surface		

Table 8-10 – Aquatic Biodiversity: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
8.9 AQUATIC BIODIVERSITY			
Impact Management Outcome: ▪ Prevent the unnecessary destruction of, and fragmentation of the aquatic biodiversity of the area. ▪ No excess aquatic habitat within the area. ▪ Prevent contamination of wetlands.			
Indicator and Compliance Mechanism: ▪ Induction training and records. ▪ Incident classification and reporting management procedure (to be developed). ▪ Environmental awareness programme/toolbox talks. ▪ Monitoring and audit reports.			
River water quality	▪ Limit vegetation removal to the infrastructure footprint area only. Where removed or damaged, vegetation areas (riparian or aquatic related) should be revegetated as soon as possible.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction ▪ Operational
	▪ Bare land surfaces downstream of construction activities must be vegetated to limit erosion from the expected increase in surface runoff from infrastructure.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	
	▪ Environmentally friendly barrier systems, such as silt nets or, in severe cases, use trenches downstream from construction sites to limit erosion and possibly trap contaminated runoff from construction.		
	▪ Storm water must be diverted from the construction site and managed in such a		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	manner to disperse runoff and prevent the concentration of storm water flow.		
	▪ Water used at construction sites should be utilised in such a manner that it is kept on site and not allowed to run freely into nearby watercourses.		
	▪ Construction chemicals, such as cement and hydrocarbons should be used in an environmentally safe manner with correct storage as per each chemical's specific storage descriptions.		
	▪ All vehicles must be frequently inspected for leaks.		
	▪ No material may be dumped or stockpiled within any rivers or drainage lines in the vicinity of the proposed Project, and must be removed immediately without destroying habitat.		
	▪ All waste must be removed and transported to appropriate waste facilities.		
	▪ High rainfall periods (usually November to March) should be avoided during the construction phase to possibly avoid increased surface runoff in attempt to limit erosion and the entering of external material (i.e. contaminants and/or dissolved solids) into associated aquatic systems.		
	▪ Runoff from the Project area should not be allowed to flow into the nearby watercourses, unless authorised by the DWS (or the competent authority).		
	▪ Careful monitoring of the areas where dust suppression is proposed should be undertaken regularly.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Biannual aquatic biomonitoring assessments of the associated water courses should be conducted by an aquatic specialist to determine impacts, whereafter new mitigation actions should be implemented as per the specialist's recommendations.		
	▪ Bare surfaces downstream from the developments, where silt traps are not an option, should be well vegetated in order to attempt to limit erosion and runoff that might be carrying contaminants.		
Wetland health/functioning	▪ Areas of undisturbed, natural grassland and wetland habitat should be avoided. Areas of direct loss that cannot be avoided must be addressed via additional conservation actions/offsets as required.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO ▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction ▪ Operational ▪ Decommissioning
	▪ A loss/disturbance buffer zone of at least 100 m should be maintained between the maximum extent of construction works and the outer boundary of wetlands and riparian zones.		
	▪ To prevent loss of natural habitat in wetlands beyond the direct disturbance footprint, prior to any vegetation clearing, the development footprints should be clearly marked out with flagging tape/posts in the field. Vegetation clearing should be restricted to the proposed project footprints only, with no clearing permitted outside of these areas.		
	▪ The extent of disturbance should be limited by restricting all construction activities to the servitude as far as practically possible.		
	▪ Locate all laydown areas and temporary construction infrastructure at least 100 m from the edge of delineated wetlands.		
	▪ Wetland/river crossings should be constructed utilizing designs that ensure that hydrological integrity of the affected wetlands is preserved, and natural flow regimes are maintained (i.e., no impoundment upstream of crossings, or flow		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	concentration downstream of crossings.		
	▪ Ideally construction activities should take place in winter (during the dry season). Where summer construction is unavoidable, temporary diversions of the streams and stormwater management interventions might be required.		
	▪ Install erosion prevention measures as part of the stormwater management plan, prior to the onset of construction activities. Measures should include energy dissipating measures such as sandbags, Ecology, or low berms on approach and departure slopes to crossings to prevent flow concentration. Sediment barriers such as silt fences or the placement of hay bales around the lower edge of bare soil areas, and active re-vegetation of disturbed areas as soon as possible.		
Increased water run-off and erosion	▪ Clearing of vegetation, compaction and levelling should be restricted to the footprint of the proposed development.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction ▪ Operation ▪ Decommissioning
	▪ All roads should have water diversion structures with energy dissipation features to slow and disperse the water into the receiving area.		
	▪ A rehabilitation and revegetation plan should be developed as part of the EMP.		
	▪ Regular monitoring of the site during construction for erosion problems.		
	▪ Silt traps should be used where there is a danger of topsoil eroding and entering streams and other sensitive areas.		
	▪ If applicable, topsoil should be removed and stockpiled, then reapplied as soon as possible in order to facilitate regeneration of the natural vegetation on cleared areas.		
	▪ Where applicable, construct stabilisation structures on slopes to prevent erosion.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Reduce activity on site after large rainfall events when the soils are wet. No driving off hardened roads until soils have dried out and the risk of bogging down has decreased.		
	▪ A suitably qualified person should plan, design and supervise the proper construction of roads to minimise the impact on the environment.		
	▪ Proper road maintenance procedures should be in place.		
	▪ Removal of all infrastructure components from the site.		
	▪ Rehabilitation of all cleared and disturbed areas with local species. Implement a monitoring programme (e.g., at six-month intervals) for at least three years after decommissioning to document vegetation recovery on site.		
	▪ Off-site disposal of all facility components such as cabling and turbine parts.		

Table 8-11 – Terrestrial Biodiversity: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
8.10 TERRESTRIAL BIODIVERSITY			
Impact Management Outcome: ▪ To minimise impact to the vegetation community. ▪ To minimise impact to plant SCC.			
Indicator and Compliance Mechanism: ▪ Induction training and records. ▪ Environmental awareness programme/toolbox talks. ▪ Monitoring and audit reports.			
loss of vegetation/ habitat	▪ A walkthrough would be needed prior to construction to inform permit applications for protected plant species.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction
	▪ Where possible, ESAs that are located in the Vulnerable Rand Highveld Grassland should be avoided.		
	▪ Construction crew, in particular the drivers, should undergo environmental training (induction) to increase their awareness of environmental concerns. This includes awareness as to remaining within demarcated construction areas, no littering, handling of pollution and chemical spills, avoiding fire hazards and minimising wildlife interactions.		
	▪ Ensure that all temporary use areas e.g., laydown areas and construction camp, are located in areas of low sensitivity.		
	▪ Footprints of the turbines, crane pads, roads, construction and substation locations should be clearly demarcated. Vegetation clearance should be		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	confined to the footprint of the development and unnecessary clearance should be avoided.		
	▪ The watercourses, rocky outcrops and rocky sheets should be avoided.		
	▪ All vehicles are to remain on demarcated roads and no driving through the veld should be allowed.		
	▪ No collection of 'fuelwood' should be allowed on site.		
	▪ The ECO is to provide supervision on vegetation clearing activities and other activities which may cause damage to the environment, especially when construction commences and most vegetation clearing is taking place.		
	▪ River/stream crossings should be placed in areas without extensive wetlands and preferably in areas where the risk of disruption and erosion is low. River/stream crossings should be specifically designed not to impede or disrupt the direction and flow of the water. Specific guidelines of the aquatic specialist should be followed.		
	▪ No plants may be translocated or otherwise uprooted or disturbed without express permission from the ECO. Permits are required for the destruction or removal of provincially specially protected or protected species.		
Potential loss of threatened SCC, protected & endemic plant species	▪ A walkthrough would be needed prior to construction to inform permit applications for protected plant species.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction
	▪ Placement of infrastructure should be done in such a way as to minimise the impact on SCC or protected species.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Construction crew, in particular the drivers, should undergo environmental training (induction) to make them aware of the importance of SCC and protected species.		
	▪ Permits are required for removal of protected species prior to construction, should avoidance not be possible		
Loss of faunal habitat	▪ Vegetation clearance should be confined to the smallest possible footprint of the development and unnecessary clearance should be avoided.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction
	▪ Construction crew, in particular the drivers, should undergo environmental training (induction) to increase their awareness of environmental concerns.		
	▪ A speed limit (of e.g., 40 km/h or appropriate limit) should be set on all roads and strictly adhered to.		
	▪ Development should avoid drainage lines and rocky outcrops. The outcrops may be favoured habitat for reptiles and other species since they offer protection from predators.		
	▪ Proper waste management procedures should be in place to avoid waste lying around and to remove all waste material from the sites.		
	▪ Observe buffer zones along drainage lines.		
Direct faunal mortalities due to construction and increased	▪ Construction crew, in particular the drivers, should undergo environmental training to increase their awareness of environmental concerns in order to	▪ Site Manager ▪ Contractor	▪ Construction

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
traffic	reduce the number of road kills. The crew should also be made aware of not harming or collecting species such as snakes, tortoises and owls which are often persecuted.	▪ ESCO / ECO ▪ EO	
	▪ Proper waste management procedures should be in place to avoid litter, food or other foreign material from lying around and all waste material should be removed from the site.		
	▪ Speed limits (e.g., 40 km/h or appropriate limit) should be set on all roads on site.		
	▪ Personnel should not be allowed to roam into the veld.		
	▪ Ensure that cabling and electrical infrastructure at the site are buried sufficiently deeply to avoid being excavated by fauna and that where such infrastructure emerges above-ground that it is sufficiently protected from gnawing animals.		
	▪ Any dangerous fauna (e.g., snakes, scorpions) that are encountered during construction should not be handled or molested by construction staff and the ECO or other suitably qualified persons should be contacted to remove the animals to safety.		
	▪ Holes and trenches should not be left open for extended periods of time and should only be dug when needed for immediate construction. Trenches that may stand open for some days, should have an escape ramp to allow any fauna that fall in to escape.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Should electrical fences be erected it must be done according to the norms and standards of the Nature Conservation Authorities in Gauteng.		
	▪ Access to the site should be strictly regulated to reduce the opportunities for poaching.		
Increased dust deposition	▪ Excessive dust must be reduced by spraying water onto the soil.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction ▪ Operation ▪ Decommissioning
Increased human activity, noise and light levels	▪ The SANS standards should be adhered to in terms of noise levels.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction
	▪ No major construction should be done at night.		
	▪ If there is any part of the site that needs to be lit at night for security reasons, then appropriate lighting should be installed to minimise negative effects on nocturnal animals. Motion-detecting lights should also be considered.		
Impacts of roads	▪ Wherever possible, existing roads/tracks should be used.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction
	▪ The construction of a road should be done in the most environmentally sensitive manner possible.		
	▪ A suitably qualified person should plan, design and supervise the proper construction of roads to minimize the impact on the environment.		
	▪ Roads should be provided with run-off structures to reduce the risk of erosion.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Proper road maintenance procedures should be in place.		
	▪ A long-term commitment to the maintenance of the road should be accepted. Roads can easily become ruts and erosion gullies if not properly planned and maintained.		
	▪ Driving in wet clayey soils after rain also result in deep tracks that damage the road surface and lead to other users bypassing such areas, thereby forming new tracks alongside the original ones.		
	▪ River/stream crossings should not be placed in areas with extensive wetlands and preferably in areas where the risk of disruption and erosion is low. All river/stream crossings should be inspected by the aquatic specialist during final design of the layout to ensure that optimal and acceptable locations have been chosen for river crossings.		
	▪ River/stream crossings should be specifically designed not to impede or disrupt the direction and flow of the water. Specific guidelines of the aquatic specialist should be followed.		
	▪ Roads should not have steep curbs.		
	▪ Implement a monitoring program for the early detection of alien invasive plant species.		
	▪ A control program should be employed to combat declared alien invasive plant		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	species in the most environmentally friendly manner that does not result in undesirable secondary impacts.		
	▪ Herbicides for the control of alien species should be applied according to the relevant instructions and by appropriately trained personnel.		
	▪ No alien species should be used in rehabilitation or landscaping.		
	▪ Use only plants and seed collected on-site for revegetation.		
	▪ Material brought onto site e.g., building sand should be regularly checked for the germination of alien species.		
	▪ Cleared areas may need to be fenced-off during rehabilitation to exclude livestock and wildlife.		
Establishment of alien vegetation	▪ Implement a monitoring program (at least three-monthly intervals) for the early detection of alien invasive plant species. This programme should continue for at least 3 years post decommissioning	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction ▪ Operation ▪ Decommissioning
	▪ A control program should be employed to combat declared alien invasive plant species in the most environmentally friendly manner that does not result in undesirable secondary impacts.		
	▪ Herbicides for the control of alien species should be applied according to the relevant instructions and by appropriately trained personnel.		
	▪ No alien species should be used in rehabilitation or landscaping.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Use only plants and seed collected on-site for revegetation.		
	▪ Cleared areas may need to be fenced-off during rehabilitation to exclude livestock and wildlife.		
	▪ Material brought onto site e.g., building sand should be regularly checked for the germination of alien species.		
	▪ No alien species should be used for landscaping, rehabilitation or any other purpose.		
	▪ Clearing of alien species should be done on a regular basis.		
Changes in animal behaviour	▪ Construction crew should undergo environmental training, by way of an induction course, to increase their awareness of environmental concerns.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction
	▪ Development should avoid rocky outcrops and wetlands.		
	▪ Soil compaction should be kept to a minimum by restricting driving to designated roads.		
	▪ If there is any part of the site that needs to be lit at night for security reasons, then appropriate lighting should be installed to minimise negative effects on nocturnal animals. Motion-detecting lights should also be considered.		
	▪ The mitigation measures as indicated by the noise specialist must be adhered to.		
Direct faunal mortalities	▪ Maintenance crew should undergo environmental training, by way of an induction course, to increase their awareness of environmental concerns.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Operational
	▪ Access to the site should be strictly controlled.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ All excess wires, cables and waste material should be removed from the site.		
	▪ All vehicles at the site should adhere to a low speed limit (of e.g. 40 km/h (or whatever is appropriate) and slow-moving fauna such as tortoises on roads should be moved off the road.		
	▪ Electrical fences should be erected according to the norms and standards of the Nature Conservation Authorities in Gauteng.		
Increased light and noise levels and changes in animal behaviour	▪ The mitigation measures as indicated by the noise specialist must be adhered to.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Operational
	▪ Maintenance crew should undergo environmental training, by way of an induction course, to increase their awareness of environmental concerns.		
	▪ Soil compaction should be kept to a minimum by restricting driving to designated roads.		
	▪ If there is any part of the site that needs to be lit at night for security reasons, then appropriate lighting should be installed to minimise negative effects on nocturnal animals. Motion-detecting lights should also be considered.		
Faunal mortalities	▪ Decommissioning crew should undergo environmental training to increase their awareness of environmental concerns. ▪ Speed limits (of e.g., 40 km/h) should be adhered to.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Decommissioning
	▪ Proper waste management procedures should be in place and no material should be left on site in order to prevent instances of ensnarement or ingestion of foreign material. Electrical fences should be erected according to the norms and standards of the Nature Conservation Authorities in Gauteng.		

Table 8-12 – Plant Species: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
8.11 PLANT SPECIES			
Impact Management Outcome: ▪ To minimise impact to the vegetation community ▪ To minimise impact to plant SCC			
Indicator and Compliance Mechanism: ▪ Induction training and records. ▪ Environmental awareness programme/toolbox talks. ▪ Monitoring and audit reports.			
Loss of vegetation/habitat	▪ Avoidance: Areas of undisturbed natural habitat should be avoided as far as practically possible: A walkthrough would be needed prior to construction to ensure that sensitive species and/or habitats are avoided and to inform permitting. Should the results of the walkthrough indicate that sensitive species and/or habitats are not fully avoided, further micrositing of the infrastructure should be undertaken through an amendment process post-authorisation. Where possible, ESAs that are located in the Vulnerable Rand Highveld Grasslan should be avoided. Construction crew, in particular the drivers, should undergo environmental training (induction) to increase their awareness of environmental concerns. This includes awareness as to remaining within demarcated construction areas, no littering, handling of pollution and chemical spills, avoiding fire hazards and minimising wildlife interactions.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Pre-Construction

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	Ensure that all temporary use areas e.g., laydown areas and construction camp, are located in areas of low sensitivity. Permits must be obtained for the destruction or removal of provincially specially protected or protected species.		
Loss of threatened, SCC, protected & endemic plant species	▪ Minimisation: Footprints of the turbines, crane pads, roads, construction and substation locations should be clearly demarcated. Vegetation clearance should be confined to the footprint of the development and unnecessary clearance should be avoided. All vehicles are to remain on demarcated roads and no driving through the veld should be allowed. No collection of 'fuelwood' should be allowed on site.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction ▪ Operational
Establishment of alien vegetation	▪ Minimisation and Avoidance: Implement a monitoring program for the early detection of alien invasive plant species. A control program should be employed to combat declared alien invasive plant species in the most environmentally friendly manner that does not result in undesirable secondary impacts. Herbicides for the control of alien species should be applied according to the relevant instructions and by appropriately trained personnel. Material brought onto site e.g., building sand should be regularly checked for the germination of alien species.		▪ Construction ▪ Operational ▪ Decommissioning
	▪ Rehabilitation: No alien species should be used in rehabilitation or landscaping.		▪ Construction ▪ Operational

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	Use only plants and seed collected on-site for revegetation. Cleared areas may need to be fenced-off during rehabilitation to exclude livestock and wildlife.		
Increased water run-off and erosion	▪ Avoidance and Minimisation: Clearing of vegetation, compaction and levelling should be restricted to the footprint of the proposed development. All roads should have water diversion structures with energy dissipation features to slow and disperse the water into the receiving area. Regular monitoring of the site during construction must be undertaken to identify and address erosion problems. Silt traps should be used where there is a danger of topsoil eroding and entering streams and other sensitive areas. Where applicable, construct stabilisation structures must be installed on slopes to prevent erosion. Reduce activity on site after large rainfall events when the soils are wet. No driving off hardened roads until soils have dried out and the risk of bogging down has decreased. A suitably qualified person should plan, design and supervise the proper construction of roads to minimise the impact on the environment.		▪ Construction ▪ Operational ▪ Decommissioning
	▪ Rehabilitation: A rehabilitation and revegetation plan should be developed as part of the EMP. If applicable, topsoil should be removed and stockpiled, then reapplied as soon as possible in order to facilitate regeneration of the natural vegetation on cleared areas.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
Impacts of roads	▪ Avoidance and Minimisation: Wherever possible, existing roads/tracks should be used. Roads should not have steep curbs. The construction of a road should be done in the most environmentally sensitive manner possible. Roads should be provided with run-off structures to reduce the risk of erosion.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction

Table 8-13 – Animal Species: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
8.12 ANIMAL SPECIES			
Impact Management Outcome: ▪ Prevent the loss of the faunal community			
Indicator and Compliance Mechanism: ▪ Induction training and records. ▪ Incident classification and reporting management procedure (to be developed). ▪ Environmental awareness programme/toolbox talks. ▪ Adhere to sensitivity map criteria ▪ Monitoring and audit reports.			
Loss of fauna habitat	▪ Avoidance: Areas of undisturbed natural habitat should be avoided as far as practically possible: A walkthrough would be needed prior to construction to ensure that sensitive species and/or habitats are avoided and to inform permitting. Should the results of the walkthrough indicate that sensitive species and/or habitats are not fully avoided, further micrositing of the infrastructure should be undertaken through an amendment process post-authorisation. Construction crew, in particular the drivers, should undergo environmental training (induction) to increase their awareness of environmental concerns. This includes awareness as to remaining within demarcated construction areas, no littering, handling of pollution and chemical spills, avoiding fire hazards and minimising wildlife interactions. Ensure that all temporary use areas e.g. laydown areas and construction camp, are located in areas of low sensitivity. Permits should be obtained for the destruction or removal of provincially specially protected or protected species.	▪ Developer	▪ Pre-Construction
Loss of fauna habitat	▪ Minimisation:	▪ Site Manager	▪ Construction

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	Footprints of the turbines, crane pads, roads, construction and substation locations should be clearly demarcated. Vegetation clearance should be confined to the footprint of the development and unnecessary clearance should be avoided; and All vehicles are to remain on demarcated roads and no driving through the veld should be allowed.	▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Rehabilitation
Direct faunal mortalities due to construction and increased traffic	▪ Minimisation and Avoidance: Speed limits (e.g., 40 km/h or appropriate limit) should be set on all roads on site. Holes and trenches should not be left open for extended periods of time and should only be dug when needed for immediate construction. Trenches that may stand open for some days, should have an escape ramp to allow any fauna that fall in to escape. Should electrical fences be erected it must be done according to the norms and standards of the Nature Conservation Authorities in Gauteng. Access to the site should be strictly regulated to reduce the opportunities for collusions.		▪ Construction
Increased human activity, noise and light levels.	▪ Avoidance and Minimisation: The SANS standards should be adhered to in terms of noise levels. No major construction should be done at night. If there is any part of the site that needs to be lit at night for security reasons, then appropriate lighting should be installed to minimise negative effects on nocturnal animals.		▪ Construction ▪ Operational
Impacts of roads	▪ Avoidance and Minimisation: Wherever possible, existing roads/tracks should be used. Roads should not have steep curbs.	▪ Developer	▪ Construction
Changes in animal behaviour	▪ Avoidance and Minimisation: Development should avoid rocky outcrops and wetlands. If there is any part of the site that needs to be lit at night for security reasons, then appropriate lighting should be installed to minimise negative effects on	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	nocturnal animals. Soil compaction should be kept to a minimum by restricting driving to designated roads. The mitigation measures as indicated by the noise specialist must be adhered to.		
Direct faunal mortalities	▪ Avoidance and Minimisation: Access to the site should be strictly controlled. Maintenance crew should undergo environmental training, by way of an induction course, to increase their awareness of environmental concerns. All vehicles at the site should adhere to a low speed limit (of e.g. 40 km/h (or whatever is appropriate) and slow-moving fauna on roads should be moved off the road.	▪ Developer	▪ Operational ▪ Decommissioning

Table 8-14 – Avifauna: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
8.13 AVIFAUNA			
Impact Management Outcome: ▪ To minimise impacts to avifauna and their habitat			
Indicator and Compliance Mechanism: ▪ Induction training and records. ▪ Incident classification and reporting management procedure (to be developed). ▪ Environmental awareness programme/toolbox talks. ▪ Monitoring and audit reports.			
▪ Displacement of priority species	▪ No turbines should be constructed in the turbine exclusion buffer zones as indicated in the sensitivity map.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction
	▪ Restrict construction to the immediate infrastructural footprint. Access to remaining areas should be strictly controlled to minimise disturbance of priority species. This recommendation especially applies within the very high and high sensitivity areas depicted in the sensitivity map.		
	▪ Minimise removal of natural vegetation and rehabilitate natural vegetation post-construction where possible.		
	▪ Prioritise upgrading existing roads (where the requisite roads authority permission has been issued) over constructing new roads.		
	▪ Apply noise and dust control measures according to best practice in the industry.		
	▪ Strictly implement the recommendations of ecological and botanical specialists to reduce the level of habitat loss.		
Displacement of priority species from breeding/feeding/roosting	▪ No turbines should be constructed in the turbine exclusion buffer zones as indicated in the sensitivity map.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO	▪ Operational
	▪ Restrict construction to the immediate infrastructural footprint where possible.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
areas	Access to remaining areas should be strictly controlled to minimise disturbance of priority species. This recommendation especially applies within the very high and high sensitivity areas depicted in the sensitivity map.	▪ EO	
	▪ Once operational, vehicle and pedestrian access to the site should be controlled and restricted to the facility footprint as much as possible to prevent unnecessary destruction of vegetation.		
	▪ Formal live-bird monitoring should commence following initial turbine operation, as per the Best Practice Guidelines, to determine the extent to which priority species displacement has occurred. Operational monitoring should be undertaken for the first two (preferably three) years of operation, and then repeated every five years thereafter for the operational lifetime of the facility.		
Bird mortality and injury resulting from collisions with the wind turbines	▪ No turbines should be constructed in the turbine exclusion buffer zones as indicated in the sensitivity map.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Operational
	▪ Restrict construction to the immediate infrastructural footprint where possible. Access to remaining areas should be strictly controlled to minimise disturbance of priority species. This recommendation especially applies within the very high and high sensitivity areas depicted in the sensitivity map.		
	▪ Once operational, vehicle and pedestrian access to the site should be controlled and restricted to the facility footprint as much as possible to prevent unnecessary destruction of vegetation.		
	▪ Formal live-bird monitoring should commence following initial turbine operation, as per the Best Practice Guidelines, to determine the extent to which priority species displacement has occurred. Operational monitoring should be undertaken for the first two (preferably three) years of operation, and then repeated every five years thereafter for the operational lifetime of the facility.		
Electrocution of priority species on the on-site sub-stations and internal 33kV network.	▪ Use underground cabling as much as is practically possible.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Operational
	▪ Where the use of overhead lines is unavoidable, raptor-friendly pole design should be used, with appropriate mitigation measures for complicated pole structures (e.g., insulation of live components to prevent electrocutions on terminal structures and pole transformer), as recommended by the Avifaunal		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	Specialist. ▪ Apply insulation reactively in the substation if significant electrocutions of SCC are recorded.		
Collisions of priority species with the internal 33kV network	▪ Use underground cabling as much as is practically possible. ▪ All above-ground internal medium voltage lines must be marked with Eskom approved Bird Flight Diverters according to the applicable Eskom standard.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Operational
Noise pollution and environmental disruption during the decommissioning phase	▪ Restrict dismantling to the immediate infrastructural footprint where possible. Access to remaining areas should be strictly controlled to minimise disturbance of priority species. This recommendation especially applies within the very high and high sensitivity areas depicted in the sensitivity map. ▪ Apply noise and dust control measures according to best practice in the industry. ▪ Prioritise the use of existing access roads during the decommissioning phase and avoid construction of new roads where feasible. ▪ The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the activity footprint is concerned.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Decommissioning

Table 8-15 – Archaeological and Cultural Heritage: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
8.14 ARCHAEOLOGICAL AND CULTURAL HERITAGE			
Impact Management Outcome: ▪ To ensure that sites/artefacts of heritage value are identified and protected.			
Indicator and Compliance Mechanism: ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Incident classification and reporting management procedure (to be developed). ▪ Monitoring and audit reports.			
Archaeological resources	▪ Implement a 30 m buffer between the archaeological sites and the proposed infrastructure (it is recognised that a 30 m buffer may be impossible to the south of Site 05 due to the farm boundary but the buffer in this area should be as large as is technically feasible)	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction
	▪ Report any chance finds made during development.		
Damage to or destruction of graves	▪ Implement a minimum 30 m no-go buffer around the graveyard at Site 23 and fence the portion of the graveyard falling within the project site with a farm-style fence with pedestrian gate.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction
Visual intrusion into the cultural landscape	▪ Ensure that all areas not required during operation are rehabilitated.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction
	▪ Keep the construction phase as short as possible.		
Visual intrusion into the cultural landscape	▪ Ensure that all maintenance activities remain in designated and approved areas.	▪ Site Manager ▪ Contractor	▪ Operational

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Paint buildings in earthy colours where feasible to reduce contrast and	▪ ESCO / ECO ▪ EO	
	▪ Make use of an early-warning system to switch the red lights on only when required.		
Visual intrusion into the cultural landscape	▪ Rehabilitation of all areas not required for post-decommissioning use and must be undertaken according to a rehabilitation plan.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Decommissioning
	▪ The decommissioning phase should be kept as short as possible.		

Table 8-16 – Palaeontology: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
8.15 PALAEONTOLOGY			
Impact Management Outcome: ▪ To ensure that palaeontological material is identified and protected.			
Indicator and Compliance Mechanism: ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Incident classification and reporting management procedure (to be developed). ▪ Monitoring and audit reports.			
Loss of palaeontological resources	▪ The impact on the palaeontological heritage can be reduced greatly by a palaeontologist conducting an inspection of any deep excavations (>4m) within potentially sensitive parts of the site if potential fossils have been seen by the ECO. The palaeontologist can then assess whether any scientifically important fossils would need to be removed, with the relevant SAHRA permit in place.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction
	▪ Implement chance find protocol: - The following procedure is only required if fossils are seen on the surface and when drilling/excavations commence. - When excavations begin the rocks and discard must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (trace fossils, plants, insects, bone or coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted. - Photographs of similar fossils must be provided to the developer to assist in recognizing the fossil plants, vertebrates, invertebrates or trace fossils in the shales and mudstones. This information will be built into the EMP's training and awareness plan and procedures.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	- Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment. - If there is any possible fossil material found by the environmental officer then a qualified palaeontologist should be sub-contracted to conduct a site visit to inspect the selected material and check the dumps where feasible. - Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits. - If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils. - If no fossils are found and the excavations have finished then no further monitoring is required.		

Table 8-17 – Traffic: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
8.16 TRAFFIC			
Impact Management Outcome: ▪ To ensure that the traffic impacts of the project are mitigated and managed.			
Indicator and Compliance Mechanism: ▪ Induction training and records. ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Monitoring and audit reports. ▪ Incident classification and reporting management procedure (to be developed). ▪ PPE Register. ▪ Occupational health and safety plan (to be developed). ▪ Health and safety protocol (to be developed). ▪ Traffic and transportation management plan			
Increase in Development Trips	▪ Reduce the construction period, where possible.	▪ Site Manager ▪ Contractor	▪ Construction ▪ Decommissioning
	▪ Stagger the construction phase.		
	▪ Possibly provide two access points to the site to split construction vehicle trips and reduce the risk of congestion.		
	▪ Staff and general trips should occur outside of peak traffic periods as much as possible.		
	▪ Stagger components delivery to site.		
	▪ Use of mobile batch plants and quarries in close proximity to the site to		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	decrease the impact on the surrounding road network. ▪ Reduce the decommissioning period where possible. ▪ Stagger the decommissioning phase. ▪ Source on-site water if possible.		
Noise and dust pollution	▪ Source on-site water if possible.	▪ Site Manager ▪ Contractor	▪ Operational

Table 8-18 – Visual: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
8.17 VISUAL			
Impact Management Outcome: ▪ To ensure that the changes to the landscape character of the area are mitigated to minimise the negative impact.			
Indicator and Compliance Mechanism: ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Incident classification and reporting management procedure (to be developed). ▪ Monitoring and audit reports.			
Visual Impacts	▪ Carefully plan to minimise the construction period and avoid construction delays.	▪ Developer ▪ Site Manager	▪ Construction
	▪ Where possible, restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting.		
	▪ Inform receptors within 1km of the WEF development area of the construction programme and schedules.		
	▪ Maintain a neat construction site by removing rubble, litter and waste materials regularly.		
	▪ Minimise vegetation clearing and rehabilitate cleared areas as soon as possible.		
	▪ Position storage / stockpile areas in unobtrusive positions in the landscape, where possible.		
	▪ Make use of existing gravel access roads where possible.		
	▪ Limit the number of vehicles and trucks travelling to and from the construction site, where possible.		
	▪ Ensure that dust suppression techniques are implemented:		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	• on all access roads; • in all areas where vegetation clearing has taken place; and • on all soil stockpiles.		
	▪ Turbine colours should adhere to CAA requirements. Logos on the turbines should be kept to a minimum and turbine towers should be painted in neutral colours such as white or grey.	▪ Developer ▪ Site Manager	▪ Operational
	▪ Inoperative turbines should be repaired promptly, as they are considered more visually appealing when the blades are rotating (or at work) (Vissering, 2011).		
	▪ If turbines need to be replaced for any reason, they should be replaced with turbines of similar height and scale to lessen the visual impact.		
	▪ As far as possible, limit the number of maintenance vehicles which are allowed to access the site.		
	▪ Non-reflective surfaces should be used where possible.		
	▪ Ensure that dust suppression techniques are implemented on all gravel access roads.		
	▪ As far as possible, limit the amount of security and operational lighting present on site (whilst adhering to relevant safety standards).		
	▪ Light fittings for security at night should reflect the light toward the ground and prevent light spill.		
	▪ Lighting fixtures should make use of minimum lumen or wattage whilst adhering to relevant safety standards.		
	▪ Mounting heights of lighting fixtures should be limited, or alternatively foot-light or bollard level lights should be used.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ If possible, make use of motion detectors on security lighting.		
	▪ Where possible, the operation and maintenance buildings should be consolidated to reduce visual clutter.		
	▪ All infrastructure that is not required for post-decommissioning use should be removed.	▪ Developer ▪ Site Manager	▪ Operational
	▪ Carefully plan to minimize the decommissioning period and avoid delays.		
	▪ Maintain a neat decommissioning site by removing rubble and waste materials regularly.		
	▪ Position storage / stockpile areas in unobtrusive positions in the landscape, where possible.		
	▪ Ensure that dust suppression procedures are maintained on all gravel access roads throughout the decommissioning phase.		
	▪ All cleared areas should be rehabilitated as soon as possible.		

Table 8-19 – Socio-Economic: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
8.18 SOCIO-ECONOMIC			
Impact Management Outcome: ■ To ensure that the negative socio-economic impacts are mitigated and managed. ■ To ensure that the positive socio-economic impacts are enhanced.			
Indicator and Compliance Mechanism: ■ Induction training and records. ■ Health, safety, environmental and community incident and complaints management system register. ■ Monitoring and audit reports. ■ Incident classification and reporting management procedure (to be developed). ■ PPE Register. ■ Occupational health and safety plan (to be developed). ■ Health and safety protocol (to be developed). ■ Employment records and community engagement local enterprise development records.			
Creation of local employment, training, and business opportunities	■ Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.	■ Site Manager ■ Contractor ■ Developer ■ Site Manager	■ Construction
	■ Where reasonable and practical, the proponent should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories. However, due to the low skills levels in the area, the majority of skilled posts are likely to be filled by people from outside the area.		
	■ Where feasible, efforts should be made to employ local contactors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria.		
	■ Before the construction phase commences the proponent should meet with		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	representatives from the MM to establish the existence of a skills database for the area. If such as database exists, it should be made available to the contractors appointed for the construction phase		
	▪ The local authorities, community representatives, and organisations on the interested and affected party database should be informed of the final decision regarding the project and the potential job opportunities for locals and the employment procedures that the proponent intends following for the construction phase of the project.		
	▪ Where feasible, training and skills development programmes for locals should be initiated prior to the initiation of the construction phase.		
Construction workers on local communities	▪ Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.	▪ Site Manager ▪ Contractor ▪ Developer ▪ Site Manager	▪ Construction
	▪ Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.		
	▪ The SEP and CHSSP should include a Grievance Mechanism that enables stakeholders to report resolve incidents		
	▪ Where possible, the proponent should make it a requirement for contractors to implement a 'locals first' policy for construction jobs, specifically for semi and low-skilled job categories.		
	▪ The proponent should consider the option of establishing a Monitoring Committee (MC) for the construction phase that representatives from local landowners, farming associations, and the local municipality. This MC should be established prior to commencement of the construction phase and form part of the SEP.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ The proponent and contractor should develop a Code of Conduct (CoC) for construction workers. The code should identify which types of behaviour and activities are not acceptable. Construction workers in breach of the code should be subject to appropriate disciplinary action and/or dismissed. All dismissals must comply with the South African labour legislation. The CoC should be signed by the proponent and the contractors before the contractors move onto site. The CoC should form part of the CHSSP.		
	▪ The proponent and the contractor should implement an HIV/AIDS, COVID-19 and Tuberculosis (TB) awareness programme for all construction workers at the outset of the construction phase. The programmes should form part of the CHSSP.		
	▪ The contractor should provide transport for workers to and from the site on a daily basis. This will enable the contactor to effectively manage and monitor the movement of construction workers on and off the site.		
	▪ The contractor must ensure that all construction workers from outside the area are transported back to their place of residence within 2 days for their contract coming to an end.		
	▪ No construction workers, with the exception of security personnel, should be permitted to stay over-night on the site.		
Job seekers on local communities	▪ Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.	▪ Site Manager ▪ Contractor ▪ Developer ▪ Site Manager	▪ Construction
	▪ Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.		
	▪ The proponent, in consultation with the MCLM, should investigate the option of establishing a MC to monitor and identify potential problems that may arise due		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	to the influx of job seekers to the area. The MC should also include the other proponents of solar energy projects in the area.		
	▪ The proponent should implement a “locals first” policy, specifically with regard to unskilled and low skilled opportunities.		
	▪ The proponent should implement a policy that no employment will be available at the gate.		
Risk to safety, livestock, and farm infrastructure	▪ The developer should compensate the directly affected landowners for impact during the construction phase.	▪ Site Manager ▪ Contractor ▪ Developer ▪ Site Manager	▪ Construction
	▪ Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.		
	▪ Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.		
	▪ The proponent should enter into an agreement with the directly affected farmers whereby damages to farm property etc. during the construction phase will be compensated for. The agreement should be signed before the construction phase commences.		
	▪ All farm gates must be closed after passing through.		
	▪ Contractors appointed by the proponent should provide daily transport for low and semi-skilled workers to and from the site.		
	▪ The proponent should establish a MC and CoC for workers (see above).		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ The proponent should hold contractors liable for compensating farmers and communities in full for any stock losses and/or damage to farm infrastructure that can be linked to construction workers. This should be contained in the Code of Conduct to be signed between the proponent, the contractors, and neighbouring landowners. The agreement should also cover loses and costs associated with fires caused by construction workers or construction related activities (see below).		
	▪ The proponent should implement a Grievance Mechanism that provides local farmers with an effective and efficient mechanism to address issues related to report issues related to damage to farm infrastructure, stock theft and poaching etc.		
	▪ The Environmental Management Plan (EMP) must outline procedures for managing and storing waste on site, specifically plastic waste that poses a threat to livestock if ingested.		
	▪ Contractors appointed by the proponent must ensure that all workers are informed at the outset of the construction phase of the conditions contained in the Code of Conduct, specifically consequences of stock theft and trespassing on adjacent farms.		
	▪ Contractors appointed by the proponent must ensure that construction workers who are found guilty of stealing livestock and/or damaging farm infrastructure are dismissed and charged. This should be contained in the CoC. All dismissals must be in accordance with South African labour legislation.		
	▪ It is recommended that no construction workers, with the exception of security personnel, should be permitted to stay over-night on the site.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
Increased risk of grass fires	▪ Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ E	▪ Construction
	▪ Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.		
	▪ The proponent should enter into an agreement with the directly affected farmers whereby damages to farm property etc., during the construction phase will be compensated for. The agreement should be signed before the construction phase commences.		
	▪ Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas.		
	▪ Smoking on site should be confined to designated areas.		
	▪ Contractor should ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high-risk dry, windy winter months.		
	▪ Contractor should provide adequate fire-fighting equipment on-site, including a fire fighting vehicle.		
	▪ Contractor should provide fire-fighting training to selected construction staff. As per the conditions of the Code of Conduct, in the advent of a fire being caused by construction workers and or construction activities, the appointed contractors		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	must compensate farmers for any damage caused to their farms. The contractor should also compensate the fire-fighting costs borne by farmers and local authorities.		
	▪ No construction staff, with the exception of security staff, to be accommodated on site overnight.		
Nuisance impacts	▪ Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO ▪ Developer	▪ Construction
	▪ Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.		
	▪ Timing of construction activities should be planned to avoid / minimise impact on key farming activities, including planting and harvesting operations.		
	▪ The proponent should establish a MC to monitor the construction phase and the implementation of the recommended mitigation measures. The MC should be established before the construction phase commences, and should include key stakeholders, including representatives from local farmers and the contractor(s). The MF should also address issues associated with damage to roads and other construction related impacts.		
	▪ Ongoing communication with landowners and road users during construction period. This should be outlined in the SEP.		
	▪ The proponent should implement a Grievance Mechanism that provides local farmers and other road users with an effective and efficient mechanism to address issues related to construction related impacts, including damage to local gravel farm roads. ▪ Implementation of a road maintenance programme throughout the construction		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	phase to ensure that the affected roads maintained in a good condition and repaired once the construction phase is completed.		
	▪ Repair of roads on the project property at the end of construction period where required.		
	▪ Dust suppression measures must be implemented on un-surfaced roads, such as wetting on a regular basis and ensuring that vehicles used to transport building materials are fitted with tarpaulins or covers.		
	▪ All vehicles must be roadworthy, and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits.		
Loss of farmland	▪ The developers should liaise with the owners of the property to identify suitable alternative locations for the construction camp clusters.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO ▪ Developer	▪ Construction
	▪ The loss of high-quality agricultural land should be avoided and or minimised. The recommendations of the agricultural / soil assessment should be implemented.		
	▪ Affected landowners should be consulted about the timing of construction related activities in advance.		
	▪ The footprint associated with the construction related activities (access roads, construction platforms, workshop etc.) should be minimised.		
	▪ An Environmental Control Officer (ECO) should be appointed to monitor the establishment phase of the construction phase.		
	▪ All areas disturbed by construction related activities, such as access roads on		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	the site, construction platforms, workshop area etc., should be rehabilitated at the end of the construction phase.		
	▪ The implementation of a rehabilitation programme should be included in the terms of reference for the contractor/s appointed. The specifications for the rehabilitation programme should be drawn up by the Environmental Consultants appointed to manage the EIA.		
	▪ The implementation of the Rehabilitation Programme should be monitored by the ECO		
Improve energy security and support renewable sector	▪ Maximise opportunities for local content and procurement.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Operational
	▪ Maximise employment opportunities for local community members.		
	▪ Implement training and skills development programs for members from the local community		
Creation of employment and business opportunities	▪ Where reasonable and practical, the proponent should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Operational
	▪ Where feasible, efforts should be made to employ local service providers that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria.		
	▪ The local authorities, community representatives, and organisations on the interested and affected party database should be informed of potential job opportunities for locals and the employment procedures for operational phase. ▪ A training and skills development programmes for locals should be initiated as part of the operational phase.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.		
	▪ The proponent should liaise with the LM with regards the establishment of a database of local companies, specifically BBBEE companies, which qualify as potential service providers.		
Generate income for affected landowners	▪ Implement agreements with affected landowners.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Operational
	▪ The loss of high-quality agricultural land should be avoided and or minimised. The recommendations of the agricultural / soil assessment should be implemented.		
Socio-economic development contributions	▪ The proponents should liaise with the MCLM to identify projects that can be supported by SED contributions.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Operational
	▪ Clear criteria for identifying and funding community projects and initiatives in the area should be identified. The criteria should be aimed at maximising the benefits for the community as a whole and not individuals within the community.		
	▪ Strict financial management controls, including annual audits, should be instituted to manage the SED contributions.		
Visual impact and impact on sense of place	▪ The recommendations contained in the VIA should be implemented.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Operational
Property values and operations	▪ The recommendations contained in the VIA should be implemented.		
Tourism in the region	▪ The recommendations contained in the VIA should be implemented.		
Retrenchment including loss	▪ The proponent should ensure that retrenchment packages are provided for all	▪ Site Manager	▪ Decommissioning

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
of jobs, and source of income	staff retrenched when the plant is decommissioned. ▪ All structures and infrastructure associated with the proposed facility should be dismantled and transported off-site on decommissioning. ▪ Revenue generated from the sale of scrap metal during decommissioning should be allocated to funding closure and rehabilitation of disturbed areas.	▪ Contractor ▪ ESCO / ECO ▪ EO	

Table 8-20 – Bats: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
8.19 BATS			
Impact Management Outcome: ▪ To ensure that the negative socio-economic impacts are mitigated and managed. ▪ To ensure that the positive socio-economic impacts are enhanced.			
Indicator and Compliance Mechanism: ▪ Induction training and records. ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Monitoring and audit reports. ▪ Incident classification and reporting management procedure (to be developed). ▪ PPE Register. ▪ Occupational health and safety plan (to be developed). ▪ Health and safety protocol (to be developed). ▪ Employment records and community engagement local enterprise development records.			
Loss of foraging habitat by clearing of vegetation	▪ Adhere to the sensitivity map criteria (already implemented). Rehabilitate cleared vegetation where possible at areas such as laydown yards.	▪ Site Manager ▪ Contractor ▪ Developer	▪ Construction
Roost destruction during earthworks	▪ Adhere to the sensitivity map criteria (already implemented).		
Mortalities (collision and/or barotrauma) during foraging (resident bats)	▪ Turbine layout adjustments to be completed through an amendment process post-EA to adhere to the sensitivity map (already implemented), and where needed, reducing blade movement at selected turbines during high-risk bat activity times/weather conditions. Acoustic deterrents are developed well enough to be trialled. The WEF should measure its bat mortality impact during operation and ensure that the WEF impact remain within sustainable levels.		▪ Operational

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
Bat mortalities	Reducing blade movement at selected turbines if a migration route is discovered. Acoustic deterrents are developed well enough to be trialled.		
Increased bat mortalities due to light attraction and habitat creation	▪ Only use lights with low sensitivity motion sensors that switch off automatically when no persons are nearby, to prevent the creation of regular insect gathering pools. This will be at turbine bases (if applicable, and other infrastructure buildings). For buildings, avoid tin roofs and roof structures that offer entrance holes into the roof cavity. The stormwater management plan should prevent the creation of any artificial wetlands and open water sources within 300m of any turbine bases.		

Table 8-21 – Geotechnical: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
8.20 GEOTECHNICAL			
Impact Management Outcome: ▪ To implement measures to minimise impacts on the environment from the initiation of construction activities through planning, careful site access route selection and implementation of mitigation measures.			
Indicator and Compliance Mechanism: ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Close-out on incidents. ▪ Monitoring and audit reports. ▪ Inductions training and register. ▪ Environmental awareness programme/toolbox talks.			
Soil erosion:	▪ Rehabilitation of affected areas (such as revegetation).	▪ Project Manager ▪ EO ▪ Contractor (Site Manager)	▪ Construction ▪ Decommissioning
	▪ Construction of temporary berms and drainage channels to divert surface water.		
	▪ Minimize earthworks and fills.		
	▪ Use existing road network and access tracks.		
	▪ Correct engineering design and construction of gravel roads and water crossings.		
	▪ Ensure adequate control stormwater flow.		
Contamination of ground and Surface water resources from heavy plant leading to quality deterioration of the water resources.	▪ Vehicle and construction machinery repairs to be undertaken in designated areas with proper soil protection. .		
	▪ Frequent checks and conditional monitoring		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
The displacement of natural earth material and overlying vegetation leading to erosion.	▪ Limit and control excavations where possible		
Damage of proposed development.	▪ Design all infrastructure according to SANS 10160-4 to ensure the proposed development meets the minimum requirements for infrastructure in a seismic zone.		
Soil Erosion	▪ Use existing road network and access tracks.	▪ Project Manager ▪ EO ▪ Contractor (Site Manager)	▪ Operational
	▪ Use of temporary berms and drainage channels to divert surface water.		
	▪ Minimize earthworks and demolish footprints.		
	▪ Rehabilitation of affected areas (such as revegetation).		
	▪ Reinstate channelized drainage features.		
	▪ Strip, stockpile and re-spread topsoil.		
Oil Spillages	▪ Vehicle repairs to be undertaken in designated areas.	▪ Project Manager ▪ EO ▪ Contractor (Site Manager)	▪ Operational

9 MANAGEMENT PLANS

A number of generic management plans have been included in the EMPr. The plans included below provide an indication of the requirements that must be followed on the proposed construction and operation of the Igolide WEF. It must be noted that many of these plans can be updated at any stage depending on any changes that may occur on the site.

The following specific plans have been compiled:

- Emergency Response Plan (ERP) (Section 9.1);
- Waste Management Plan (Section 9.2);
- Hazardous Substance Management Plan (Section 9.3);
- Fire Management Plan (Section 9.4);
- Alien Invasive Plant Management Plan (Section 9.5);
- Plant Rescue and Protection Plan (Section 9.6);
- Re-vegetation and Habitat Rehabilitation Plan (Section 9.7);
- Stormwater Management Plan (Section 9.8);
- Erosion Management Plan (Section 9.9);
- Traffic and Transport Management Plan (Section 9.10);
- Fauna Management Plan (Section 9.11);
- Avifaunal Management Plan (Section 9.12);
- Soil Management Plan (Section 9.13);
- Heritage and Palaeontological Management Plan (Section 9.14);
- Grievance Mechanism (Section 9.15);
- HIV/AIDS Management Plan (Section 9.16);
- Chance Find Procedure (Section 9.14.1);
- Security Policy (Section 9.17); and
- Bat Management Plan (Section 9.18).

9.1 EMERGENCY RESPONSE PLAN

Appropriate resources must be provided to respond to accidental and emergency situations for operations and activities during construction and operation phases. The procedures will include plans for addressing training, resources, responsibilities, communication and all other aspects required to effectively respond to emergencies associated with their respective hazards.

This ERP is intended as a practical working document for the proposed Igolide WEF. The purpose of this document is to provide the basic guidelines on how to respond to potential emergency situations that may arise during project activities. These potential emergency situations include medical emergencies and fires.

All activities associated with the project will require site-specific emergency response plans to mitigate impacts, which meet or exceed all applicable regulations.

The objectives of this plan are as follows:

- Protect the communities and the environment through the development of emergency response strategies and capabilities.

- Set out the framework for hazard identification in order to define procedures for response to the situations including the development of contingency measures.
- Structure a process for rapid and efficient response to and manage emergency situations during the construction and operational phases of the project.
- Assign responsibilities for responding to emergency situations.

The ERP must take the incident procedures referred to in Section 30 of the NEMA into account.

9.1.1 ROLES AND RESPONSIBILITIES

With respect to this plan, Igolide WEF (via the appointed EPC contractor/contractor/ principal contractor) has the responsibility to:

- Provide emergency response services (such as first aid and firefighting representative) and to structure and coordinate emergency response procedures for the project.
- Ensure that specific emergency responsibilities allocated to them are organised and undertaken.
- Ensure that employees and contractor third parties are trained and aware of all required emergency procedures.

9.1.2 EMERGENCY COMMUNICATIONS AND COORDINATION PLAN

In an emergency situation where there is an immediate threat to communities, personnel or the environment, the Project Manager will be notified immediately. The Project Manager will dispatch the Emergency Response Coordinator (or suitably tasked person) who will determine the appropriate plan of action depending on the severity of the emergency, the people affected, and the need to evacuate.

If there is a developing emergency or unusual situation, where an emergency is not imminent, but could occur if no action is taken, the Project Manager (or if the Project Manager is absent the Environmental Officer) is to be informed immediately. Once the emergency or unusual situation has been managed, the correct incident/near miss must be reported to the General Manager.

If an emergency situation poses a direct threat to communities in the area, the Environmental Officer and/or Social Officer will advise persons in the vicinity of the emergency to evacuate due to the potential risk. The appropriate government authorities will immediately be notified of such an emergency evacuation. The Emergency Response Coordinator (or suitably tasked person) will be tasked with responding to the potential risk. Should the emergency situation be such that it can be managed by Igolide WEF, equipment and personnel will be deployed to the maximum extent necessary, so as to prevent/minimise potential risks.

9.1.3 RESPONSE TO INCIDENTS

An incident is any occurrence that has caused, or has the potential to cause, a negative impact on people, the environment or property (or a combination thereof). It also includes any significant departure from standard operating procedures. The reporting and investigation of all potential and actual incidents that could have a detrimental impact on human health, the natural environment or property is required so that remedial and preventive steps can be taken to reduce the potential or actual impacts because of all such incidents.

The actions resulting from any formal or informal investigations will be used to update the EMPr.

9.1.4 BUDGET FOR EMERGENCY RESPONSE

Costs for emergency response and management will be included in the capital expenditure budget for the construction phase and operational budget for the operational and decommissioning phases of the project.

9.1.5 VERIFICATION

An environmental emergency response system will be developed for the execution of emergency drills that will include the following, inter alia:

- Fire Drills
- Emergency Evacuation Drills
- Medical and Environmental Drills.

Reporting and monitoring requirements for the plan will include:

- Monthly inspections and audits
- Quarterly reporting of accidents/ incidents
- Reporting at the time of the incident and monthly spill reporting developed by the Environmental and Quality, Health and Safety departments
- Bi-annual emergency response drills
- Annual reporting on training

Emergency response drills and reporting will be maintained by the Project Manager and will provide information regarding required revisions to training or the emergency response actions. Each incident reported will be reviewed and investigated upon occurring. Actions will be identified where possible to improve the site's overall response to emergencies. Updates/revisions that are necessary to protect worker or community health and safety will be implemented immediately after approval by the General Manager. On a bi-annual basis, Key Performance Indicators (KPIs) will be compared against past-performance and analysed for trends to determine if there are areas for improvement. Changes because of the trend analysis and identified areas for improvement will be implemented following the project's change management system as required.

9.2 WASTE MANAGEMENT PLAN

9.2.1 WASTE HIERARCHY

A waste is any solid, liquid or contained gaseous material that is being discarded by, disposal, recycling, burning or incineration. Waste management options for a particular waste need to be considered according to the Waste Management Hierarchy (**Figure 9-1**) which reflects the relative sustainability of each of the options. One of the key principles underlying the waste management hierarchy is to ensure that waste is dealt with as high up the waste hierarchy as possible. Since all waste disposal options have some impact on the environment, the only way to avoid impact is not to produce waste in the first place, and waste reduction is therefore at the top of the hierarchy. Re-use, followed by recovery techniques (recycling, composting and generating energy from waste) follow, while disposal to landfill or by incineration (the worst options) are at the bottom of the hierarchy.

In deciding on the most appropriate disposal route, both environmental and economic costs and benefits need to be considered. This decision must be reached taking into account all the costs and impacts associated with waste disposal, including those associated with the movement of waste.

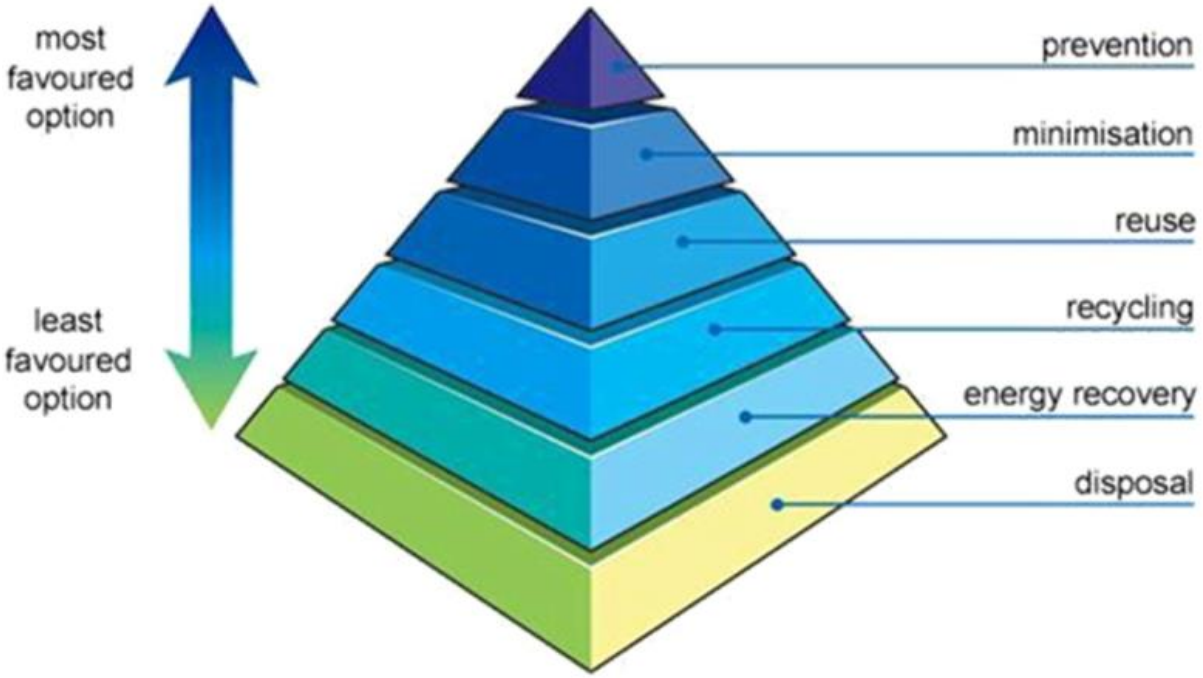


Figure 9-1: Waste Hierarchy

9.2.2 PROJECT STAGES

The purpose of this section is to assess the construction, operational processes of the proposed Igolide WEF in order to identify short comings, like raw materials procurement, infrastructure, employee training, health and safety, transportation, storage, compliance with legislative requirements, emergency preparedness and waste streams arising from an operation and its related activities, as well as the current waste management practices per waste stream. The assessment serves as the baseline against which any problem areas or gaps in waste management practises, process technology and environmental authorisations are identified and against which future performance objectives, activities and targets can be set.

The project stages are described below with the waste generation and management methods described in the corresponding tables below them including:

- Details on how waste will be managed during the construction and operational phases taking into consideration the waste management hierarchy;
- Details of the procedure for the separation of non-recyclable and recyclable waste;
- Details of the management of non-recyclable waste i.e. how waste will be stored on site during construction and operational phases, including the frequency for the removal of waste from the site and an indication of the landfill site where it will be disposed;
- Details for the management of recyclable waste e.g. the type of waste materials that will be recycled on site and the details pertaining to the offloading, sorting, handling, storage and collection procedures for the waste types (e.g. compaction and bailing, breaking of glass etc.); and
- The frequency for the removal of waste from the proposed development to where it will be finally managed must be included.

Waste Management at the project site will be undertaken in line with the EMPr to consider the correct disposal of general and hazardous waste generated on the project. **Table 9-1** describes the different waste products that the proposed project will produce, as well as the various options to dispose of them. Waste will mainly be generated during the construction phase. During operation, contractors are only on the site for limited amount of time as and when maintenance is required.

Table 9-1 - Waste Management Options

Waste	Type of Waste	Management Options
Hydrocarbons (Contaminated soil)	Hazardous	▪ Fuel and oil spillages can be a source of contamination of water sources and the soil. Management options include: • Using spill kits to clean any spillages; • Ensure storage facilities are maintained and meet industry regulations; • Transportation and storage of fuel must be regulated and correctly managed according to the EMPr; • All hazardous waste is to be disposed of at a registered hazardous landfill (safe disposal certificates must be obtained).
Contaminated Personal Protective Equipment (PPE)	Hazardous	▪ PPE can be contaminated during handling of hydrocarbons. Management options include: • Store contaminated PPE in hazardous waste skips along the servitude; • Ensure contaminated PPE is disposed of at a registered hazardous landfill (safe disposal certificates must be obtained).
General waste	General	▪ General waste (inorganic matter) can be disposed of as per normal and form part of the municipal waste management system. Management options include: • Ensure waste is stored securely in refuse bins; • Co-ordinate waste removal with the general removal of waste from the contractor laydown area .
Food waste	General	▪ Food waste is generated as site personnel take their meals on the construction site. Management options include: • Store any waste and packaging into a labelled food waste bin; • Co-ordinate waste removal with the removal of waste from the contractor laydown area; and • Co-ordinate waste removal with the general removal of waste.

9.3 HAZARDOUS SUBSTANCES MANAGEMENT PLAN

Hazardous substances are chemicals or materials that can cause acute or chronic harm to health, be it humans or the environment. The key potential sources of impact related to the management of hazardous chemical substances (HCS) and fuel during construction relate to the risk of accidental release of hydrocarbons to the environment, accidental exposure to workers, and fire and explosion risks.

Potential impacts associated with these risks, if poorly managed, include:

- Impact to soil and/or groundwater, which may result in degradation of the resource and requirement for remedial action;
- Impacts on pastoralist livelihoods due to contamination of pasture or water resources and consequent impacts to their, health, livelihood and animals;
- Impacts on human health & safety due to either direct exposure or through fire/explosion;
- Gas emissions associated with the combustion of fuel, are mainly compounds of nitrogen, carbon including very small traces of sulphur and particulate matter; and
- Fugitive emissions from HCS & fuel storage.

The purpose of this Hazardous Substances Management Plan (HSMP) is to provide a framework for the management of hazardous substances onsite during the construction and operation of the Igolide WEF:

- Ensure the handling and storage of hazardous substances are in accordance with relevant standards;
- To ensure that the storage and handling of chemicals and hydrocarbons on-site does not cause pollution to the environment or harm to persons;
- To ensure that the storage and maintenance of machinery onsite does not cause pollution of the environment or harm to persons.

9.3.1 HAZARDOUS SUBSTANCES MANAGEMENT PROCEDURE

A plan for managing the transportation, delivery, storage and handling of hazardous substances onsite is detailed below. A method statement detailing the specific storage and handling practices during construction must be prepared by the Contractor prior to the commencement of construction.

REGISTER OF HAZARDOUS SUBSTANCES

Contractors shall establish inventories or registers of hazardous substances on site. The inventory is to be updated when new hazardous substances are introduced to the workplace or the use of existing hazardous substances is discontinued. Both the chemicals' register and MSDSs must be readily available at a central location or near where the chemicals are being stored or used.

MSDS

It is standard practice that an MSDS is provided by the manufacturer or supplier of all hazardous substances. An MSDS is required for all chemicals and substances on site. These MSDSs are to be made available to all parties affected by the use or storage of the chemical. MSDSs are the key to communicating hazards and safe handling practices for chemicals. In addition, MSDS information is to be made available to all employees.

DELIVERIES

Transport of all hazardous substances must be in accordance with the relevant legislation and regulations. Contractors are responsible for identifying and securing any necessary permits for any proposed bulk fuel storage arrangements. The supplier will fill contractors fuel tanks; fuelling is the responsibility of the licensed contractor who will be supervised by the storage/work area supervisor. No 'black-market' or 'grey-import' fuels shall be used. All fuels purchased must be legitimate and subject to required duties and taxes.

Prior to fuel transfer the operator will verify that: all fuel transfer hoses have been connected properly and couplings are tight; transfer hoses are not obviously damaged; fuel transfer personnel are familiar with procedures; for fuelling stations, personnel are located at both the fuel truck and fuel transfer tank(s) and have the ability to shut off fuel flow manually; a means of communication has been established between the two people transferring fuel; and a high liquid level shutoff device can be substituted for the person at the delivery tank, in which case operation of the shutoff will be verified each time it is used; The fuel contractor will clean up and report any accidents or spills immediately to the project ESHS team.

ENVIRONMENT AND OCCUPATIONAL HEALTH AND SAFETY

The following requirements are additional to any applicable requirements established in other LTWP management plans such as the Occupational Health & Safety Management Plan:

- Storage facilities will have the applicable MSDS available;
- Smoking will be strictly prohibited from any areas where fuel loading operations take place;
- Appropriate signage will be used to identify potential spill risks;
- Any accidental damage to containment structures will be inspected immediately and appropriate repairs undertaken. The extent of damage will be reported in writing to WP as well as remedial repairs effected together with the date of repairs and any follow up inspection. Any release of fuels or other substance will be cleaned up;
- All used fuel / oil products will be collected in tanks marked “Waste Oil”; and
- All hydrocarbon associated wastes will be managed in line with the Waste Management Plan.

MATERIALS STORAGE

- All temporary hydrocarbon storage will be situated above ground. There will be no buried storage tanks permitted.
- All chemicals, fuels and other hazardous materials are to be stored in designated and bunded areas, where the bunded area is impermeable and is impervious to the stored substance as per the requirements of SABS 089:1999 Part 1. The bunded area will contain 110% volume of the largest container stored.
- Bunds and service area platforms to be cleaned and maintained regularly.
- SABS approved Spill kits must be made available on-site for the clean-up of spills and leaks of contaminants. The relevant construction crew members must be trained in their use.
- Keep a record of all hazardous substances stored on site. Clearly label all the containers storing hazardous waste.
- The storage of flammable and combustible liquids such as oils will be in designated areas which are appropriately bunded, and stored in compliance with MSDSs files and applicable regulations and safety instructions.
- Chemical and hydrocarbon storage facilities shall be covered to prevent rainfall ingress into secondary containment units and well-ventilated
- Any storage and disposal permits/approvals which may be required must be obtained, and the conditions attached to such permits and approvals will be compiled with.
- An effective monitoring system must be put in place to detect any leakage or spillage of all hazardous substances during their transportation, handling, installation and storage.

SPILL AND LEAK MANAGEMENT AND PREVENTION

- In the event of a major spill or leak of contaminants, the relevant authorities must be informed. The relevant construction crew members must be trained in their use.
- Spilled cement must be cleaned up immediately and, stored as hazardous waste and disposed of at a suitably licensed hazardous waste disposal facility.
- Routine servicing and maintenance of vehicles must not be undertaken onsite (except for emergencies). If repairs of vehicles must take place, an appropriate drip tray must be used to contain any fuel or oils.
- Any water that collects in bunds must not be allowed to stand. Should the water be contaminated, it is to be removed and treated prior to discharge, or disposed of as hazardous waste. Clean stormwater contained within the bunds may be reused.
- No chemicals must be stored or vehicle maintenance undertaken within 100m of wetlands or drainage lines.
- Construction machinery must be stored in an appropriately sealed area. If machinery cannot be stored in a sealed area then a drip tray must be used to prevent spillage from any leaks.
- As far as practicable, all equipment servicing / maintenance shall be undertaken within designated workshop areas.
- All generators on site, including generators that are not in use must be located in a bunded area or on a drip tray.
- Bunded areas and drip trays must be maintained on a regular basis.
- Diesel generators and water pumps shall be located in secondary containment areas or shall be self-contained to prevent loss of fuels and oils;
- Precautions must be in place to limit the possibility of oil and other toxic liquids from entering the soil or clean stormwater system.
- Upon completion of construction, the area must be cleared of potentially polluting materials.
- Emergency response planning will be managed via the Emergency Preparedness and Response Plan.

9.3.2 OPERATIONAL PHASE

During the operational phase of the project limited hazardous substances and chemicals will be stored onsite. During maintenance activities, contractors will need to produce a method statement detailing the specific storage and handling practices. The following measures need to be implemented onsite during the operational phase of the project.

- Hazardous substances must be stored in sealed containers within a clearly demarcated designated area.
- Care must be taken to ensure that spillage of oils and other hazardous substances are limited during maintenance. Handling of these materials must take place within an appropriately sealed and bunded area.
- Should any accidental spillage take place, it must be cleaned up according to specified standards regarding bioremediation.
- The storage of flammable and combustible liquids such as oils will be in designated areas which are appropriately bunded, and stored in compliance with MSDSs files and applicable regulations and safety instructions.
- Used oils and chemicals:

- Appropriate disposal must be arranged with a licensed facility in consultation with the administering authority;
- Waste must be stored and handled according to the relevant legislation and regulations.

9.3.3 INSPECTION, MONITORING AND TRAINING

Fuel storage areas must be inspected regularly to ensure bund stability, integrity, and function.

The contents of the Hazardous Substances Management Plan must be communicated to the staff through the induction training. On the job training can also be undertaken through the use of Environmental Toolbox Talks. All training must be undertaken as outlined in the relevant Training Procedure.

Examples of Toolbox Talks include:

- Storage of hazardous substances
- Working with hazardous substances
- Management of hazardous waste
- Spill Prevention

9.4 FIRE MANAGEMENT PLAN

The purpose of this plan is to address firefighting requirements throughout the construction of the project and to preserve and protect human life as well as tangible goods and equipment in the event of a fire.

Mitigation and management measures include, but are not limited to the following:

- All construction camps shall be provided with portable fire extinguishing equipment, in accordance with all relevant legislation and must be readily accessible.
- The Contractor shall take specific measures to prevent the spread of veld fires, caused by activities at the campsites. These measures must include appropriate instruction of employees about fire risks and designated smoking areas.
- Fire prevention facilities must be present at all storage facilities. No open fires shall be allowed on site under any circumstance. No cooking on open fires shall be done onsite to prevent runaway fires.
- The Contractor shall have operational fire-fighting equipment available on site at all times. The level of firefighting equipment must be assessed and evaluated through a typical risk assessment process.
- Emergency numbers for local police and fire department etc. must be placed in a prominent area.
- Firefighting equipment must be placed in prominent positions across the site where it is easily accessible. This includes fire extinguishers, a fire blanket as well as a water tank.
- All construction staff must be trained in fire hazard control and firefighting techniques. Translators are to be used where necessary.
- All flammable substances must be stored in dry areas which do not pose an ignition risk to the said substances.
- Smoking must only be conducted in demarcated areas.
- Firefighting equipment must be regularly maintained by a suitable service provider.

9.5 ALIEN INVASIVE PLANT MANAGEMENT PLAN

The purpose of this Plan is to provide a framework for the management of alien and invasive plant species during the construction and operation of the project, which in turn serves to manage open spaces, as required. The broad objectives of the plan include the following:

- Ensure alien plants do not become dominant in parts or the whole site through the control and management of alien and invasive species presence, dispersal and encroachment.
- Managing and maintaining the ecosystem in a near-natural state and restoring and/or rehabilitating the ecosystems to such a state.
- Develop and implement a monitoring and eradication programme for alien and invasive species.
- Promote the natural re-establishment and planting of indigenous species in order to retard erosion and alien plant invasion.

Mitigation and management measures include, but are not limited to the following:

- Monitor for early detection, to find species when they first appear on site. This should be as per the frequency specified in the management plan, and should be conducted by an experienced botanist. Early detection should provide a list of species and locations where they have been detected. Summer (vegetation maximum growth period) is usually the most appropriate time, but monitoring can be adaptable, depending on local conditions.
- Monitor for the effect of management actions on target species, which provides information on the effectiveness of management actions. Such monitoring depends on the management actions taking place. It should take place after each management action.
- Monitor for the effect of management actions on non-target species and habitats.
- Stockpiles must be kept clear of weeds and alien vegetation growth by regular weeding.
- Alien vegetation and the spread of exotic species on the site will need to be controlled.
- The contractor must be responsible for implementing a programme of weed control (particularly in areas where soil has been disturbed); and grassing of any remaining stockpiles to prevent weed invasion.
- Herbicide use shall only be allowed according to contract specifications. The application shall be according to set specifications and under supervision of a qualified technician. The possibility of leaching into the surrounding environment shall be properly investigated and only suitable herbicides shall be used.
- The use of pesticides and herbicides on the site must be discouraged as these can impact on important pollinator species of indigenous vegetation. Use of these should only be permitted where absolutely necessary.
- Correct rehabilitation with locally indigenous species.
- Monitoring programme to ensure that rehabilitation efforts are successful to ensure that risks such as erosion, spread of exotic species and the edge effect are avoided.
- Constant maintenance of the area to ensure re-colonisation of floral species.
- Ensure regular removal of alien species, which may otherwise jeopardise the proliferation of indigenous species.

9.6 PLANT RESCUE AND PROTECTION PLAN

The purpose of the plant rescue and protection plan is to implement avoidance and mitigation measures, in addition to the mitigation measures included in the EMPr to reduce the impact of the

development of the project on listed and protected plant species and their habitats, and to provide guidance on search and rescue of species of conservation concern.

Mitigation and management measures include, but are not limited to the following:

- The location of all transplanted rescued plants must be recorded, along with the identity of the plant.
- The health / vigour of each transplanted individual should be monitored as per the frequency and duration specified in the management plan.
- As a scientific control, an equal number of non-transplanted individuals of the same species, within similar habitats, should be monitored in the same way as the transplanted specimens. This will provide comparative data on the survival of wild populations relative to transplanted plants.
- If populations of threatened plant species are found to occur on site, annual monitoring of population health should take place. This should be appropriate to the species concerned.
- Vegetation clearing must only commence after a walk down has been conducted by a suitably qualified person and the necessary permits obtained.
- Vegetation clearing to be kept to a minimum. No unnecessary vegetation to be cleared.
- Vegetation removal must be limited to the construction site and must be removed only as it becomes necessary rather than removing all the vegetation throughout the site at once.
- Materials must not be delivered to the site prematurely which could result in additional areas being cleared or affected.
- No vegetation to be used for firewood.
- Gathering of firewood, fruit, medicinal plants, or any other natural material onsite or in areas adjacent to the site is prohibited unless with prior approval of the ESCO.
- Construction site office and laydown areas must be clearly demarcated and no encroachment must occur beyond demarcated areas.
- All natural areas impacted during construction must be rehabilitated with locally indigenous plant species or grassed accordingly.
- The use of pesticides and herbicides on the site must be discouraged as these can impact on important pollinator species of indigenous vegetation. Use of these should only be permitted where absolutely necessary.
- Soil stockpiles must not become contaminated with oil, diesel, petrol, garbage or any other material, which may inhibit the later growth of vegetation in the soil. Spillage can result in a loss of soil functionality thus limiting the re-establishment of flora.
- It is a legal requirement to obtain permits for specimens or protected species that will be lost due to construction of the project.
- A detailed pre-construction walk-through survey will be required during a favourable season where possible, to locate any individuals of protected plants, as well as for any populations of threatened plant species. This survey must cover the footprint of all approved infrastructure, including internal access roads and substations. The best season is early to late Summer if possible, taking administrative processes into account, but will be influenced by recent rainfall and vegetation growth.
- It is possible that some plants lost to the development can be rescued and planted in appropriate places in rehabilitation areas, but the description and appropriateness of such measures must be included in a Plant Rescue Plan. Any such measures will reduce the irreplaceable loss of resources as well as the cumulative effect. Note that Search and Rescue is only appropriate for

some species and that a high mortality rate can be expected from individuals of species that are not appropriate to transplant.

- Prior to construction commencing, a Plant Rescue Plan must be compiled to be approved by the appropriate authorities as part of the EMPr approval.
- For any plants that are transplanted, annual monitoring should take place to assess survival. This should be undertaken as per the frequency specified in the management plan and be undertaken by a qualified botanist. The monitoring programme must be designed prior to translocation of plants and should include control sites (areas not disturbed by the project) to evaluate mortality relative to wild populations.
- No collecting or poaching of any plant species.

Rescued plants

- The location of all transplanted rescued plants must be recorded, along with the identity of the plant.
- The health / vigour of each transplanted individual should be monitored as per the frequency and duration specified in the management plan.
- As a scientific control, an equal number of non-transplanted individuals of the same species, within similar habitats, should be monitored in the same way as the transplanted specimens. This will provide comparative data on the survival of wild populations relative to transplanted plants.

Threatened species

- If populations of threatened plant species are found to occur on site, annual monitoring of population health should take place. This should be appropriate to the species concerned.

For permitting purposes, the following flora survey is required prior to construction activities taking place:

- Detailed floristic walk-through survey of all footprint areas in order to document composition, especially of protected species. It is suggested this be undertaken after an appropriate time-period after rainfall, where possible, to allow emergence of any species of potential concern. The survey must also cover all footprint areas, including final road alignments. Renewable energy projects similar to the one assessed here tend to have high fluidity in terms of layout and technology, due to the current rapid evolution of the technology, which allows more efficient deployment of infrastructure. However, this means that “final” layouts regularly change. The walk-through survey:
- Must assess the footprint that will be constructed – if this changes then the new footprint areas must be subject to a walk-through survey in full.
- Must be undertaken in the correct season, if possible, taking administrative processes into account.
- Must be adequately resourced to ensure it is done properly.
- Must be undertaken by a competent botanist.

9.7 RE-VEGETATION AND HABITAT REHABILITATION PLAN

The purpose of the rehabilitation plan is to ensure that areas cleared or impacted during construction activities are rehabilitated with a plant cover that reduces the risk or erosion from these areas as well as restores some ecosystem function. The purpose of the rehabilitation plan for the site can be summarised as follows:

- Achieve long-term stabilisation of all disturbed areas to minimise erosion potential.
- Re-vegetate all disturbed areas with suitable local/indigenous plant species or grass/crop.
- Minimise visual impact of disturbed areas.
- Ensure that disturbed areas are safe for future uses.

Mitigation and management measures include, but are not limited to the following:

- Rehabilitation Plan must be compiled by an approved ecologist prior to the start of construction and decommissioning.
- All management actions associated with rehabilitation must be recorded after each management action has taken place.
- All rehabilitated areas should be monitored to assess vegetation recovery. This should be for a minimum of three years after post-construction rehabilitation but depends on the assessed trajectory of rehabilitation (whether it is following a favourable progression of vegetation establishment or not – this depends on the total vegetation cover present, and the proportion that consists of perennial growth of desired species). For each monitoring site, an equivalent comparative site in adjacent undisturbed vegetation should be similarly monitored. Monitoring data collection should include the following:
    - total vegetation cover and height, as well as for each major growth form;
    - species composition, including relative dominance;
    - soil stability and/or development of erosion features;
    - representative photographs should be taken at each monitoring period.
- Monitoring of rehabilitated areas should take place at the frequency and for the duration determined in the rehabilitation plan, or until vegetation stability has been achieved.
- Re-vegetation must aim to accelerate the natural succession processes so that the plant community develops in the desired way, i.e. promote rapid vegetation establishment.
- Re-vegetation of disturbed surfaces must occur immediately after construction activities are completed. This must be done through seeding with suitable crop or locally indigenous species typical of the representative botanical unit.
- Re-vegetation of the disturbed site is aimed at approximating as near as possible the existing vegetative conditions prevailing prior to construction.
- Seeds from surrounding seed banks can be used for re-seeding.
- Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas.
- Planting of indigenous tree species in areas not to be cultivated or built on must be encouraged.
- Habitat destruction must be limited to what is absolutely necessary for the construction of the infrastructure, including the construction of new roads. In this respect, the recommendations from the Biodiversity Assessment must be applied strictly. Personnel must be adequately briefed on the need to restrict habitat destruction, and must be restricted to the actual construction area.
- Monitoring programme to ensure that rehabilitation efforts are successful to ensure that risks such as erosion, spread of exotic species and the edge effect are avoided.

9.8 STORMWATER MANAGEMENT PLAN

The main principles in stormwater management include:

- Confine or divert any unpolluted water to a ‘clean’ water system, and polluted water to a ‘dirty’ water system;
- ‘Clean’ and ‘dirty’ water systems must be designed and constructed to prevent cross-contamination between the ‘clean’ and ‘dirty’ water systems; and
- Appropriate maintenance and management of storm water related infrastructure.

The proposed water systems or infrastructure are to be designed to prevent any potential contamination of natural water resources in the area.

A Storm Water Management and Surface Water Protection Plan cannot be compiled until the detailed designs are complete. It is stipulated in this EMPr that a Storm Water Management Plan must be compiled before any construction commences and implemented during the construction phase. This plan must indicate how all surface runoff generated as a result of the project and associated activities (during both the construction and operational phases) will be managed prior to entering any natural drainage system or wetland and how surface water runoff will be retained outside of any demarcated buffer zones and subsequently released to simulate natural hydrological conditions.

A Storm Water Management Plan will be required to support the relevant facility processes. A stormwater management plan must be developed in the preconstruction phase, detailing the stormwater structures and management interventions that must be installed to manage the increase of surface water flows directly into any natural systems. The stormwater control systems must be inspected on an annual basis to ensure these are functional. Effective stormwater management must include effective stabilisation (gabions, Reno mattresses or similar) of exposed soil and the re-vegetation of any disturbed water courses.

9.9 EROSION MANAGEMENT PLAN

Exposed and unprotected soils are the main cause of erosion in most situations. Therefore, this erosion management plan and the revegetation and rehabilitation plan are closely linked to one another and should not operate independently but should rather be seen as complementary activities within the broader environmental management of the site and should therefore be managed together. This Erosion Management Plan addresses the management and mitigation of potential impacts relating to soil erosion, including:

- Material stockpiled for long periods (2 weeks) must be retained in a bermed area.
- Stockpiles not used in three (3) months after stripping must be covered with hessian or a similar material to prevent dust and erosion.
- Sensitive areas need to be identified prior to construction so that the necessary precautions can be implemented.
- Any vegetation clearance must be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time.
- Areas to be cleared must be clearly demarcated and this footprint strictly maintained.
- Silt fences and erosion control measures must be implemented in areas where these risks are more prevalent.
- Wind screening and stormwater control must be undertaken to prevent soil loss from the site.
- Other erosion control measures that can be implemented are as follows:
    - Brush packing with cleared vegetation

- Mulch or chip packing
- Planting of vegetation
- Hydroseeding / hand sowing

- All erosion control mechanisms need to be regularly maintained.
- Seeding of topsoil and subsoil stockpiles to prevent wind and water erosion of soil surfaces.
- Re-vegetation of disturbed surfaces must occur immediately after construction activities are completed. This must be done through seeding with indigenous grasses.
- No impediment to the natural water flow other than approved erosion control works is permitted.
- To prevent stormwater damage, the increase in stormwater run-off resulting from construction activities must be estimated and the drainage system assessed accordingly.

9.9.1 MONITORING

The site must be monitored continuously during construction and operation in order to determine any indications of erosion. If any erosion features are recorded as a result of the activities on-site the Environmental Officer (during construction) or Site Manager (during operation) must:

- Assess the significance of the situation.
- Take photographs of the soil degradation.
- Determine the cause of the soil erosion.
- Inform the contractor/operator that rehabilitation must take place and that the contractor/operator is to implement a rehabilitation method statement and management plan.
- Monitor that the contractor/operator is taking action to stop the erosion and assist them where needed.
- Report and monitor the progress of the rehabilitation weekly and record all the findings in a site register.
- All actions with regards to the incidents must be reported on a monthly compliance report which will be submitted to the Competent Authority (during construction) and kept on file for consideration during the annual audits (during construction and operation).

The Contractor (in consultation with an appropriate specialist) must:

- Select a system/mechanism to treat the erosion.
- Design and implement the appropriate system/mechanism.
- Monitor the area to ensure that the system functions like it should. If the system fails, the method must be adapted or adjusted to ensure the accelerated erosion is controlled.
- Continue monitoring until the area has been stabilised.

9.10 TRAFFIC AND TRANSPORT MANAGEMENT PLAN

The purpose of a Traffic and Transportation Management Plan is to address regulatory compliance, traffic management practices, and protection measures to help reduce impacts related to transportation and the construction of temporary and long-term access within the vicinity of the project site. The objectives of this plan include the following:

- To ensure compliance with all legislation regulating traffic and transportation within South Africa National, Provincial, Local and associated guidelines.
- To avoid incidents and accidents while vehicles are being driven and while transporting personnel, materials, and equipment to and from the project site.

- To raise greater safety awareness in each driver and to ensure the compliance of all safe driving provisions for all the vehicles.
- To raise awareness to ensure drivers respect and follow traffic regulations.
- To avoid the deterioration of access roads and the pollution that can be created due to noise and emissions produced by equipment, machinery, and vehicles.

Mitigation and management measures include, but are not limited to the following:

- All vehicles used during the transport of materials and in the construction activities are required to be roadworthy per the National Road Traffic Act (NRTA) and display all pertinent certificates as required.
- All vehicles travelling to and from the site shall adhere to all laws imposed by the law enforcement agencies, and shall comply with any requests made by the law enforcement officials.
- For each convoy of abnormal vehicles/loads a designated safety officer shall be nominated. All abnormal vehicles and loads to be transported are required to have a valid permit before any trip is begun.
- The route must be assessed to determine if any structures or vegetation need to be temporarily or permanently relocated so as to avoid damage to the load as well as public and private property during the trips.
- A designated transport coordination manager must be appointed to oversee and manage the traffic safety officers. Additionally, the designated transport coordination manager must inform and keep up-to-date the interested and affected parties of all the activities taking place that may have a direct impact on them.
- A traffic safety officer shall be nominated to make all the necessary arrangements to maintain the required traffic measures for the duration of the project as outlined in the “Standard Specifications for Road and Bridge Works for State Road Authorities,’ 1998 edition. The safety officer shall liaise daily with the transportation coordination manager to keep them apprised of the state of all the traffic arrangements.
- All construction vehicles that are entering the site shall also be available via radio or telephone communication to the transport coordination manager. So that in the event of an emergency, all vehicles can be accounted for.
- All vehicles shall comply with the posted speed limits on public roads as well as the speed limits within the development. For additional speed limits that are imposed on the construction traffic, refer to the South African Road Traffic Signs Manual (SARTSM), Volume 2, June 1999 for the restrictions.
- All construction traffic shall comply with the legal load requirements as outlined in the National Road Traffic Act and National Road Traffic Regulations.
- Construction traffic entering the site along public roads must be limited to times when peak hour traffic can be avoided. The peak traffic occurs during 7h00 to 8h30, and 16h00 to 17h30.
- The South African Road Traffic Signs Manual (SARTSM), Volume 2, June 1999 is to be used for all traffic during the construction activities of the proposed project.
- During periods of high construction traffic entering and exiting the site, it is recommended that flagmen help direct the traffic. This will enable the safe movement of construction and public traffic at the entrance and reduce the number of potential conflicts.

9.11 FAUNA MANAGEMENT PLAN

The purpose of this fauna management plan is to protect species, habitats and eco-system services, ensuring no net reduction to any critically endangered / endangered species and no net loss of any critical habitats (as defined by IFC Performance Standard 6) whilst minimising disturbance to other species and habitats to the extent practicable. This plan provides a strategy to control potential impacts on fauna during the construction and operation of the Igolide WEF.

9.11.1 MANAGING IMPACT ON FAUNA

SNAKE FIND AND HANDLING:

During construction, especially clearing of vegetation, it is likely that snakes will be encountered onsite. The following steps need to be undertaken in the event of a snake onsite:

- All work in that area is to cease;
- The site foreman/ site supervisor is to be notified;
- Snake handling will be undertaken by suitably trained and certified onsite personnel. The site supervisor or foreman needs to contact the relevant onsite personnel, who will safely remove and release the snake at a suitable habitat.

The following measures need to be communicated to all staff to ensure both human and snake safety:

- Under no circumstances may any site staff handle snakes without the proper snake handling training.
- All staff are to be provided with the PPE (e.g. snake gaiters and safety boots) to limit the potential for snake bites.
- Signage identifying the service provider appointed for snake handling must be erected around site. It is recommended that an individual onsite undergoes snake handling training to ensure that if an emergency arises it can be dealt with immediately.
- Intentional harming of snakes is prohibited onsite.

MAMMALS AND REPTILES

During the construction phase of the project the following mitigation measures need to be implemented and adhered to at all times to ensure that the impacts to fauna is managed and mitigated where possible.

WALK DOWN PRIOR TO CONSTRUCTION

Prior to the start of any construction or associated activities in areas of potential biodiversity concern, the Contractors will carry out a walk-though over the area accompanied by the ESCO. The objective is to identify any sensitive habitats including potential for species of conservation interest (i.e. to consider the presence of any rare species of fauna, but establish possible risk of snake bites; inspect tree cavities for bats, etc.) that may be directly or indirectly affected by the proposed works.

Any important and significant habitats must be suitably demarcated and made a no-go area.

LIMIT THE DEVELOPMENT FOOTPRINT

- The development area must be clearly defined and marked off accordingly. All No- Go areas must be demarcated and warning signs prohibiting access erected.

- Areas to be cleared must be clearly marked in the field to eliminate unnecessary clearing/ disturbance.

LIMIT DISTURBANCE

- The extent of clearing and disturbance to the native vegetation must be kept to a minimum so that the impact on fauna and their habitats is restricted.
- Where roads pass right next to major water bodies provisions must be made for the fauna such as toads to pass under the roads by using culverts or something similar.
- Vehicles to adhere to speed limits at all times.
- The intentional harming and killing of animals will be prohibited through on-site supervision and worksite rules.
- Any litter onsite needs to be cleaned up immediately to prevent it being blown into the environment surrounding the development site.

INSPECTIONS AND MONITORING

- The following inspections and monitoring need to be undertaken during the construction phase:
- Observation of vegetation clearing activities by the ESCO.
- Recording faunal fatalities to monitor success of relocation efforts.
- Regular monitoring of construction activities by the designated onsite personnel and the ESCO.
- The ESHS team will collate details and investigate all Project-related wildlife complaints and incidents including instances of unauthorised hunting, poaching, bush trade, disturbance of breeding sites and injuries / fatalities. Corrective actions will be instigated where needed to avoid recurrence.

TRAINING

The contents of the Fauna Management Plan must be communicated to the staff through the induction training. On the job training can also be undertaken through the use of Environmental Toolbox Talks. All training must be undertaken as outlined in the relevant Training Procedures

Examples of Toolbox Talks include:

- Snakes bites
- Snake handling
- No-Go areas
- Encountering fauna onsite
- Poaching

9.12 AVIFAUNAL MANAGEMENT PLAN

The purpose of this avifaunal management plan is to provide mitigation and management measures onsite that to minimise the impacts on the priority bird species that potentially occur onsite. A number of the priority species are associated with the aquatic features on the site.

9.12.1 DESIGN MANAGEMENT PROCEDURES

- Ensure that key areas of conservation importance and sensitivity are avoided (as determined by the avifaunal specialist assessment).
- Where possible, installing transmission cables underground (subject to habitat sensitivities and in accordance with existing best practice guidelines for underground cable installation).

- Marking overhead cables using deflectors and where possible avoiding use over areas of high bird concentrations, especially for species vulnerable to collision

9.12.2 CONSTRUCTION MANAGEMENT PROCEDURE

The following mitigation and management measures must be implemented for the displacement of priority species due to disturbance during the construction phase:

- A site- specific construction management Plan (CEMP) must be implemented, which gives appropriate detailed description of how construction activities must be conducted. All contractors are to adhere to the CEMP and must apply good environmental practice during construction. This must be done by an Avifaunal Specialist.
- Providing adequate briefing for site personnel and, in particularly sensitive locations. Personnel must be adequately briefed on the need to restrict habitat destruction, and must be restricted to the actual building sites.
- Habitat destruction must be limited to what is absolutely necessary for the construction of the infrastructure, including the construction of new roads.
- During the construction phase, an avifaunal specialist must conduct surveys/exploration of the site. The aim will be to locate nest sites, so that these may continue to be monitored during the construction and operation phase.
- Measures to control noise and dust must be applied according to current best practice in the industry.
- Maximum use must be made of existing access roads and the construction of new roads must be kept to a minimum.
- Implementing an agreed post-development monitoring programme.
- Timing construction to avoid sensitive periods.

9.12.3 POST-CONSTRUCTION MONITORING

The avifaunal post-construction monitoring at the proposed Igolide WEF must be conducted in accordance with the latest version of the *Best practice guidelines for avian monitoring and impact mitigation at proposed wind energy Project Sites in southern Africa* (Jenkins *et al*. 2011)[1].

9.12.3.1 Aim Of Post-Construction Monitoring

The avifaunal post construction monitoring aims to assess the impact of the wind farm by comparing pre- and post- construction monitoring data and to measure the extent of bird fatalities caused by the wind farm. Post-construction monitoring is therefore necessary to:

- Confirm as far as possible what the actual impacts of the wind farm are on avifauna; and
- Determine what mitigation is required if necessary (adaptive management).

The proposed post-construction monitoring can be divided into three categories:

- Habitat classification

[1] Jenkins, A.R., Van Rooyen, C.S., Smallie, J.J., Anderson, M.D., & A.H. Smit. 2011. Best practice guidelines for avian monitoring and impact mitigation at proposed wind energy development sites in southern Africa. Produced by the Wildlife & Energy Programme of the Endangered Wildlife Trust & BirdLife South Africa.

- Quantifying bird numbers and movements (replicating baseline pre-construction monitoring)
- Quantifying bird mortalities.

Post-construction monitoring will aim to answer the following questions:

- How has the habitat available to birds in and around the wind farm changed?
- How has the number of birds and species composition changed?
- How have the movements of priority species changed?
- How has the wind farm affected priority species' breeding success?
- How many birds collide with the turbines? And are there any patterns to this?
- What mitigation is necessary to reduce the impacts on avifauna?

9.12.3.2 Timing

Post-construction monitoring should commence as soon as possible after the first turbines become operational to ensure that the immediate effects of the facility on resident and passing birds are recorded, before they have time to adjust or habituate to the development. However, it should be borne in mind that it is also important to obtain an understanding of the impacts of the facility as they would be over the lifespan of the facility. Over time the habitat within the wind farm may change, birds may become habituated to, or learn to avoid the facility. It is therefore necessary to monitor over a longer period than just an initial one year.

9.12.3.3 Duration

Monitoring should take place in Year 1 and 2 of the operational phase, and then repeated in Year 5 and every five years after that. After the first year of monitoring, the programme should be reviewed to incorporate significant findings that have emerged. This may entail the revision of the number of turbines to be searched, and the size of the search plots, depending on the outcome of the first year of monitoring. If significant impacts are observed and mitigation is required, the matter should be taken up with the operator to discuss potential mitigation. In such instances the scope of monitoring could be reduced to focus only on the impacts of concern.

9.12.3.4 Habitat Classification

Any observed changes in bird numbers and movements at a wind farm may be linked to changes in the available habitat. The avian habitats available must be mapped at least once a year (at the same time every year), using the same methods which were used during pre-construction.

9.12.3.5 Bird Numbers And Movements

To determine if there are any impacts relating to displacement and/or disturbance, all methods used to estimate bird numbers and movements during baseline monitoring must be applied as far as is practically possible in the same way to post-construction work to ensure maximum comparability of these two data sets. This includes sample counts of small terrestrial species, counts of large terrestrial species and raptors, focal site surveys and vantage point surveys according to the current best practice.

9.12.3.6 Collisions

The collision monitoring must have three components:

- Experimental assessment of search efficiency and scavenging rates of bird carcasses on the site;
- Regular searches in the immediate vicinity of the wind farm turbines for collision casualties;

- Estimation of collision rates.

9.12.3.7 Searcher Efficiency And Scavenger Removal

The value of surveying the area for collision victims is only valid if some measure of the accuracy of the survey method is developed. The probability of a carcass being detected and the rate of removal/decay of the carcass must be accounted for when estimating collision rates and when designing the monitoring protocol. This must be done in the form of searcher and scavenger trails twice a year.

9.12.3.8 Collision Victim Surveys

Aligning search protocols

The search protocol must be agreed upon between the bat and bird specialists to constitute an acceptable compromise between the current best practice guidelines for bird and bat monitoring.

Searches must begin as early in the mornings as possible to reduce carcass removal by scavengers. A carcass searcher must walk in straight line transects, 6 m apart, covering 3 m on each side. A team of searchers and one supervisor must be trained to implement the carcass searches. The searchers must have a vehicle available for transport per site. The supervisor must assist with the collation of the data at each site and provide the data to the specialist in electronic format on a weekly basis. The specialists must ensure that the supervisor is completely familiar with all the procedures concerning the management of the data. The following must be sent to the specialist on a weekly basis:

- Carcass fatality data (hardcopy and scans as well as data entered into Excel spreadsheets);
- Pictures of any carcasses, properly labelled;
- GPS tracks of the search plots walked; and
- Turbine search interval spreadsheets.

When a carcass is found, it must be bagged, labelled, and kept refrigerated for species confirmation when the specialist visits the site.

Estimation of collision rates

Observed mortality rates need to be adjusted to account for searcher efficiency and scavenger removal. There have been many different formulas proposed to estimate mortality rates. The available methodologies must be investigated, and an appropriate method will be applied. The current method which is used widely is the GenEst method.

9.12.3.9 Deliverables

Annual report

An operational monitoring report must be completed at the end of each year of operational monitoring. As a minimum, the report must attempt to answer the following questions:

- How has the habitat available to birds in and around the wind farm changed?
- How has the number birds and species composition changed?
- How have the movements of priority species changed?
- How has the wind farm affected priority species' breeding success?
- What are the likely drivers of any changes observed?
- How many, and which species of birds collided with the turbines and

- Associated infrastructure? And are there any patterns to this?
- What is the significance of any impact observed?
- What mitigation measures are required to reduce the impacts?

Quarterly reports

Concise quarterly reports must be provided with basic statistics and any issues that need to be red flagged

9.13 SOIL MANAGEMENT PLAN

Some of the most significant impacts on soil properties occur as a result of activities associated with construction. Construction activity can have adverse impacts on soil in a number of ways by:

- Covering soil with impermeable materials, effectively sealing it and resulting in significant detrimental impacts on soils' physical, chemical and biological properties, including drainage characteristics.
- Contaminating soil as a result of accidental spillage or the use of chemicals.
- Over-compacting soil through the use of heavy machinery or the storage of construction materials.
- Reducing soil quality, for example by mixing topsoil with subsoil.
- Wasting soil by mixing it with construction waste or contaminated materials, which then have to be treated before reuse or even disposed of at landfill as a last resort.

Careful management of topsoil and subsoil is an important aspect of sustainable use of materials that are being stripped. Without a proper Soil Resource Plan there is the risk of losing, damaging or contaminating valuable soil resources. The purpose of this Soil Management Plan is to outline principles for soil management to ensure the integrity of the resource during and post-construction. This plan must be read together with the Emergency Response Plan in order to minimise the risk of contamination of soils.

9.13.1 PRINCIPLES FOR SOIL MANAGEMENT

THE CORRECT HANDLING OF TOPSOIL

- Before beginning work on site, topsoil must be stripped from all areas that will be disturbed by construction activities. Appropriate equipment must be used and appropriate work practices must be implemented for soil stripping as mishandling soil can have an adverse effect on its properties.
- Topsoil must be stripped in the driest condition possible.
- Topsoil must be retained on site in order to be used in site rehabilitation. The correct handling of the topsoil layer is in most cases the key to rehabilitation success.
- It is important that the correct depth of topsoil is excavated in order to ensure good plant growth. If excavation is too shallow, then an important growth medium for new seedlings could be lost. If excavation is too deep, this could lead to the dilution of the seed and nutrient rich topsoil with deeper sterile soil.
- Topsoil and subsoil layers must never be mixed. The mixture of topsoil with the deeper sterile soil hinders the germination of seeds which are buried too deep in the soil layer. Mixture of soil layers also leads to the dilution of nutrient levels which are at highest concentration within the topsoil, resulting in lower levels of nutrients available for new seedlings.
- To enable soil to be reused on site at a later stage, it needs to be stored in temporary stockpiles to minimise any damage or loss of function. Stockpiles must not be higher than 2m.

Alternatively, topsoil berms can be created on the site boundaries. There are a number of important considerations when creating stockpiles - including soil erosion, pollution to watercourses and the risk of flooding. These will be affected by the size, height and method of forming stockpiles, and how they are protected and maintained.

- Topsoil must be stored separately from other soil in heaps until construction in an area is complete.
- The duration of topsoil storage must be minimised as far as possible. Storing topsoil for long periods leads to seed bank depletion following germination during storage, and anoxic conditions develop inside large stockpile heaps.
- All stockpiles must be positioned away from drainage lines.
- Sediment fencing must be erected downslope of all stockpiles to intercept any sediment and upslope runoff must be diverted away from stockpiles.

STRIPPING OF SUBSOIL

- The following protocols must be followed when stripping subsoil:
- On many sites subsoil will not need to be stripped but merely protected from damage. However, on other sites it might need to be temporarily removed. Where subsoil is required to be stripped, this must be undertaken before commencement of construction from all areas that are to be disturbed by construction activities or driven over by vehicles.
- Subsoil stripping depths depend on the correct identification of the sub-soil types on an ad-hoc basis, where no formal survey data exists.
- Subsoil must be stripped in the driest condition possible.
- To enable soil to be reused on site at a later stage, it needs to be stored in temporary stockpiles to minimise any damage or loss of function. There are a number of important considerations when creating stockpiles - including soil erosion, pollution to watercourses and the risk of flooding. These will be affected by the size, height and method of forming stockpiles, and how they are protected and maintained.
- All stockpiles must be positioned away from drainage lines.
- Sediment fencing must be erected downslope of all stockpiles to intercept any sediment and upslope runoff must be diverted away from stockpiles.

9.14 HERITAGE AND PALAEONTOLOGICAL MANAGEMENT PLAN

The purpose of this document is to provide a response guideline should archaeological sites, palaeontological sites or graves become exposed during ground altering activities within the Igolide WEF area. Heritage resources are protected in terms of the National Heritage Resources Act, Act 25 of 1999 (NHRA).

9.14.1 CHANCE FIND PROCEDURE

- The following procedure is only required if fossils are seen on the surface and when drilling/excavations commence.
- When excavations begin the rocks and discard must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (trace fossils, plants, insects, bone or coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
- Photographs of similar fossils must be provided to the developer to assist in recognizing the fossil plants, vertebrates, invertebrates or trace fossils in the shales and mudstones (for example see

Figure 9-2,). This information will be built into the EMP's training and awareness plan and procedures.

- Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
- If there is any possible fossil material found by the environmental officer then a qualified palaeontologist should be sub-contracted to conduct a site visit to inspect the selected material and check the dumps where feasible.
- Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
- If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
- If no fossils are found and the excavations have finished then no further monitoring is required.

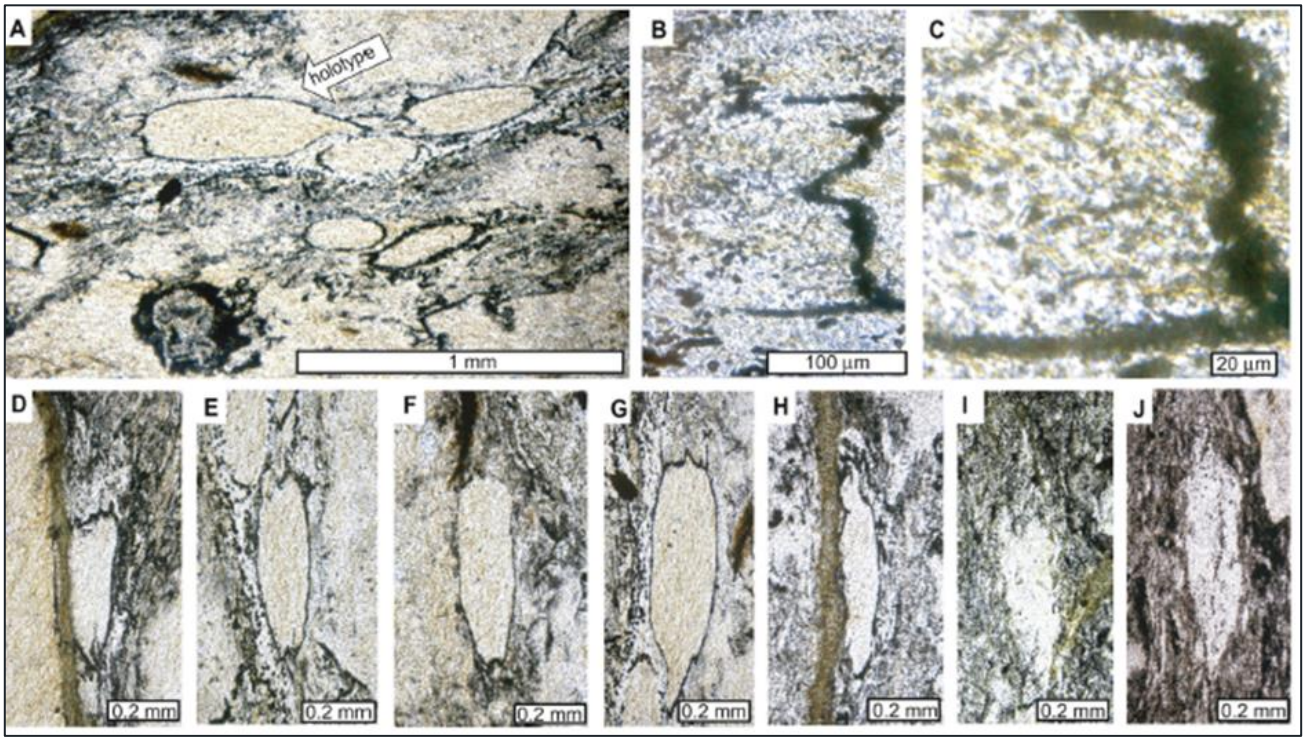


Figure 9-2 - Photomicrographs of the putative microfossils Diskagma buttoni. Note the size – these would not be visible. Figure 4 of Retallack et al., 2013

Source: Bamford, 2023

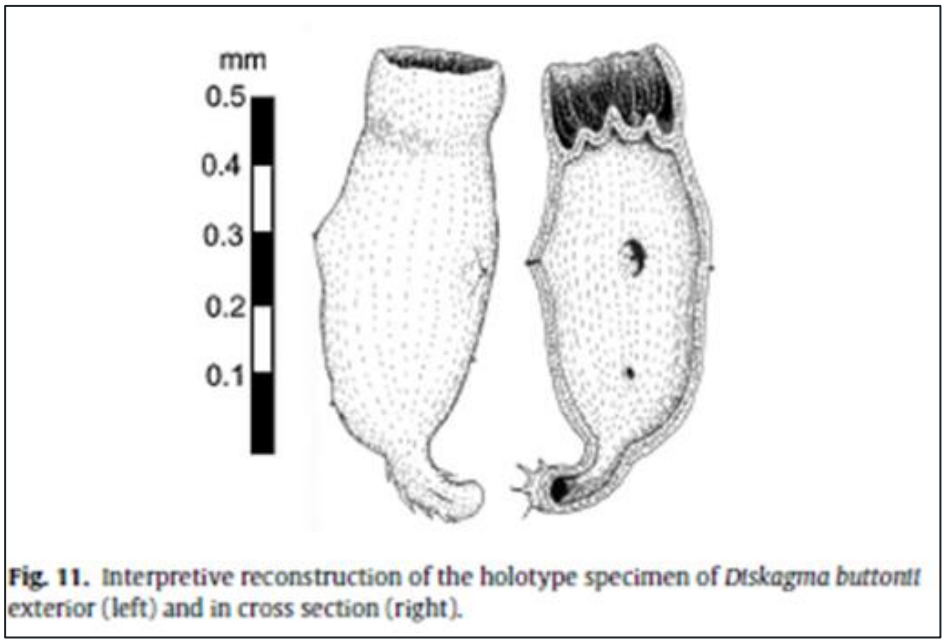


Fig. 11. Interpretive reconstruction of the holotype specimen of *Diskagma buttonii* exterior (left) and in cross section (right).

Figure 9-3 - Reconstruction of the microfossil in Retallack et al., (2013) with features not visible in the micrographs

Source: Bamford, 2023

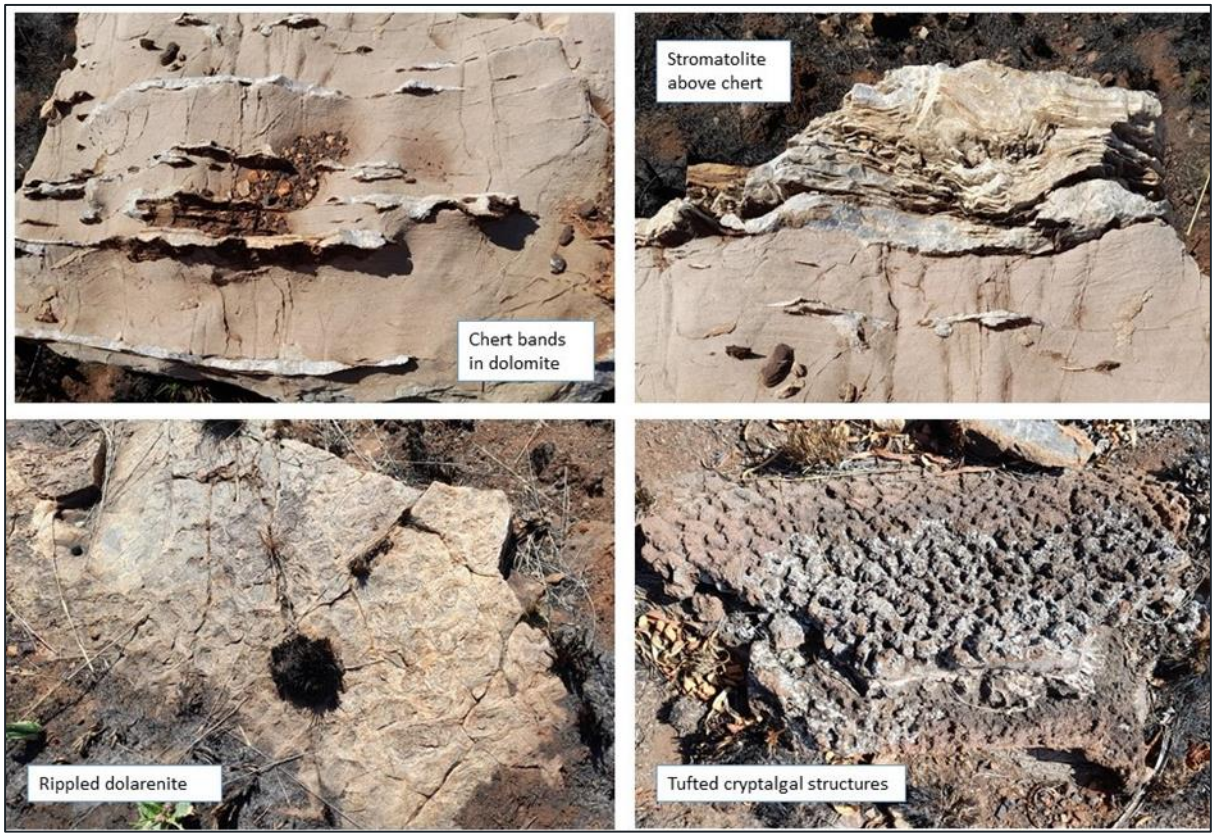


Figure 9-4 - Photographs of stromatolites as seen in the field

Source: Bamford, 2023

9.14.2 TRAINING, INSPECTION AND MONITORING

Since it is not practical to have a regular monitoring presence over the construction period by either an archaeologist or palaeontologist, environmental awareness training must be conducted by the EO for all contractors and subcontractors. The training must include, as a minimum, the following:

- Identifying potential features of heritage significance;
- Procedures for dealing with heritage resources discovered on site;
- Applicable Legislation pertaining to the protection of heritage resources; and
- The importance of protecting heritage resources.
- The contents of the Heritage Management Plan must be communicated to the staff through the induction training. On the job training can also be undertaken through the use of Environmental Toolbox Talks.

9.15 GRIEVANCE MECHANISM

9.15.1 GRIEVANCE MECHANISM - EXTERNAL

A grievance mechanism is a tool used to address affected communities' concerns and complaints and is an important pillar of the stakeholder engagement process, since it creates opportunities for companies and communities to identify problems and discover solutions together. The Project proponent can benefit from understanding community concerns and complaints and addressing them through all stages of project development.

Where it is anticipated that a new project will involve ongoing risk and adverse impacts on surrounding communities, the project proponent is required to establish a grievance mechanism to receive and facilitate resolution of the affected communities' concerns and complaints about the proponent's environmental and social performance. The grievance mechanism should be scaled to risks and adverse impacts of the project, address concerns promptly, use an understandable and transparent process that is culturally appropriate and readily accessible to all segments of the affected communities, and do so at no cost to communities and without retribution. The mechanism should not impede access to judicial and administrative remedies.

This Grievance Mechanism has been developed to receive and facilitate grievances and provide a solution to these concerns and grievances. The aim of the grievance mechanism is to ensure that grievances or concerns raised by local landowners, staff and or communities are addressed in a manner that:

- Provides accessible avenues for all internal and external stakeholders to contact management of the facility;
- Provides a predictable, transparent, and credible process to all parties, resulting in outcomes that are seen as fair, effective, lasting and dealt with in a timely manner;
- Builds trust as an integral component of staff and broader community relations activities; and
- Enables more systematic identification of issues and trends affecting a project, facilitating corrective action and pre-emptive engagement.

The aim of this Grievance Mechanism is to address grievances in a manner that does not require a potentially costly and time-consuming legal process. This grievance mechanism also ensures alignment with local and international best practices in human resources development and stakeholder engagement.

OBJECTIVES

The objectives of the grievance mechanism include:

- To be respectful of complainant culture, values, traditions and views;
- To resolve grievances at the local level and in a timely manner;
- To identify the root causes of grievances and address systemic issues;
- To provide a process that is dialogue based, with the complainant and the Proponent cooperating in the investigation, discussion, resolution and announcement of the grievance and result;
- To ensure fair, equitable and consistent outcomes to resolve grievances;
- To enhance and continuously improve the ability of the Proponent to fairly address community concerns.

SCOPE AND RESPONSIBLE PARTIES

A grievance mechanism is primarily for the community to raise relevant concerns about the Project / Proponent's activities and is to be implemented throughout the life cycle of the Project (i.e. throughout assessment, construction, and implementation phases).

WSP will only be involved in the stakeholder engagement and grievance management process for the assessment phase. The Project proponent and the Contractor will be responsible for implementation of the grievance mechanism throughout the construction phase.

GRIEVANCE REDRESS PROCEDURE

This grievance mechanism sets out the following steps to be taken to resolve grievances.

- **Register grievance**

1. A grievance can be submitted in a written letter, e-mail, fax, or raised verbally in person or via telephone.
2. Grievances raised during the assessment process are to be submitted to the EAP via the details provided as per the stakeholder engagement notifications. The EAP will notify the Proponent of the grievance.
3. Grievances raised during the implementation process are to be submitted to the Proponent / Contractor via the relevant details, which are to be made available to registered stakeholders prior to commencement of onsite activities, as well as via site notice boards.
4. In the event that a complaint is raised verbally, the responsible person must obtain the approval of the complainant as to the documented complaint (by way of signature of the Receipt of Grievance Form). Should the complainant have literacy issues, the responsible person may request that a third party (friend / relative of complainant) is available to verify / approve the contents of the documented complaint to the satisfaction of the complainant.
5. The submission should include the nature of the grievance, the date when it occurred and the name and contact details of the complainant.
6. Grievances will be accepted anonymously or through a third party (e.g. unions, NGOs, local authorities, community representatives, etc.).
7. Individuals have the right to request that their name be kept confidential throughout the grievance process.

8. As men and women may communicate their grievances differently, and also have different types of grievances, the complainant may request that their grievance is processed by a female / male representative. In the event that such a request is made, the Proponent, as far as reasonably practicable, will accommodate this request.

- **Within a Week (7 days) of receiving the grievance the Proponent will:**

1. Enter the grievance into the Proponent's records that track grievances;
2. Assess the grievance according to specific criteria and if necessary, develop an appropriate approach for the particular grievance;
3. Provide a written acknowledgement of the grievance including the name of the responsible person to contact about progress, an explanation of the steps that will be taken to investigate, discuss and resolve the grievance, and an anticipated timetable for processing the grievance.

- **Processing the Grievance:**

The responsible person will:

1. Identify the parties involved;
2. Clarify issues and concerns raised by the grievance through direct dialogue;
3. Classify the grievance in terms of seriousness according to the gravity of the allegation, the potential impact on an individual's or a group's welfare and safety, or the public profile of the issue;
4. Convene a staff group with expertise relative to the grievance;
5. Determine the method for resolving the grievance – the most common approaches, not excluding others, will be:
   - The Proponent proposes a solution;
   - The Proponent and aggrieved party decide together the solution;
   - The Proponent and aggrieved party defer to a third party for mediation / arbitration.
6. Gather views of other stakeholders, including those of the Proponent and if necessary, an agreed neutral technical opinion;
7. Determine initial options that parties have considered and explore various approaches for settlement;
8. Conduct the process as agreed;
9. Close the grievances by signing the Complaint Close-Out Form (i.e. that the grievance has been resolved satisfactory to both parties).
10. The Proponent may "close" the grievance even if the complainant is not satisfied with the outcome. This option can be pursued by the Proponent in the case that the complainant is unable to substantiate a grievance, or if there is an obvious speculative or fraudulent attempt. In such situations, the Proponent's efforts to investigate the grievance and to arrive at a conclusion will be well documented and the complainant advised of the situation. The Proponent (or contractors working for the Proponent) will not dismiss grievances based on a

cursory review and close them in their grievance record unless the complainant has been notified and had the opportunity to provide supplementary information / evidence;

11. Keep a record that tracks the progress and communications for each grievance.

- **Processing Timeline**

1. The Proponent will aim to bring the grievance to a resolution within 30 days of receiving the grievance. The grievance shall be acknowledged within 7 days by the responsible person, and responded to within 30 days. If the matter takes longer than 30 days to resolve, the complainant will be informed through dialogue and in writing, of the reason for the delay, any advances or difficulties encountered and the anticipated new resolution date.

While the general principles for grievance redress during construction are as above, a project-specific external stakeholder grievance mechanism shall be implemented, and shall comply with the arrangements outlined in Error! Reference source not found..

RECOURSE

If the complainant is not satisfied with the outcome of the grievance process the aggrieved party has the right to address the grievance via the judicial system.

MANAGING, TRACKING, RECORDING GRIEVANCES – INTERNALLY

In terms of managing grievances the Proponent will:

- Appoint a senior manager to oversee the Grievance Mechanism. Another member of staff will be appointed to carry out the day-to-day work in this area and involve specialist staff and external parties, where required, who may need to be consulted to resolve a grievance.
- Maintain a register of grievances. All activities, including registration of the grievance and the progress through to outcome will be recorded.
- Ensure that grievances and resolutions are communicated internally to all staff through monthly reports.
- Launch the Grievance Mechanism and regularly remind communities that it is available to use.

Contractors are expected to follow this Grievance Procedure. Contractor shall be proactive and available to participate in the grievance resolution processes. Contractor participation is intended to allow for specific contractor grievances to be addressed efficiently.

Contractors shall ensure that all individual contractor employees are aware of the Grievance Procedure.

Contractors will receive any grievance from an individual or community and notify the Proponent thereof immediately.

Contractors shall not make any direct agreements or resolution with local communities without prior coordination of such actions with the Proponent.

The Contractor's community relations team (or equivalent) will attend all coordination meetings requested by the Proponent, as required. The contractor community relations management (or equivalent) will report to the Proponent's management team on a regular basis – in regards to social incidents and community relations issues. The Proponent, or their representative, will conduct regular audits on contractors to ascertain compliance with this Grievance Procedure.

9.15.2 GRIEVANCE MECHANISM - INTERNAL

The Proponent will establish a Grievance Mechanism that will set out the process for workers to communicate their grievances. The grievance mechanism will be available to workers of the Proponent, Contractors and subcontractors.

A Code of Conduct will set out practice measures that the construction workers will have to adhere to, to ensure a positive relationship is built and maintained with the landowners and local communities.

9.16 HIV/AIDS MANAGEMENT PLAN

Should the project be developed, an HIV/AIDS plan will be developed, however for input into this EMPr, a generic and high-level management plan has been compiled.

9.16.1 OBJECTIVES OF THIS PLAN

The overall objectives of the HIV/AIDS management plan are:

- Create awareness around HIV/AIDS amongst onsite personnel;
- Mitigate and manage the spread of HIV/AIDS onsite; and
- Provide support for staff who have HIV/AIDS

9.16.2 GUIDING PRINCIPLES

1. Non- discrimination: The respect of human rights and dignity of persons infected or affected by HIV/ AIDS requires equality between individuals living with HIV/AIDS and those without. No employee will be discriminated against on the basis of his or her real or perceived HIV positive status. This includes access to training and promotion.
2. Job Security: Employees with HIV infection or AIDS will not be dismissed on the grounds of their status. Persons with AIDS-related illnesses should be able to work for as long as medically fit in available, appropriate work (reasonable accommodation).
3. Confidentiality : All persons with HIV or AIDS have the legal right to privacy. No employee or applicant for a job shall be required to disclose HIV-related personal information. Nor should co-workers be obliged to reveal such information about fellow workers. Company management and medical staff as well as union leaders and officials are bound by strict confidentiality about a person's status.
4. Voluntary Counselling and Testing (VCT) : No HIV/AIDS testing will be required for job applicants or for persons already in employment. Individuals are encouraged to know their HIV status through testing. Testing must be voluntary, confidential and with the informed and written consent of the person concerned. Professional pre- and post-testing counselling services must be available.
5. Treatment and Care : Workers infected with HIV and suffering from AIDS and their dependents are entitled to the same health services as those with other diseases. Treatment with antiretroviral drugs must be available when VCT is advocated. Dependents of workers who have died from AIDS or AIDS-related diseases must have access to the same care as those who have died from other diseases or industrial accidents.

6. Gender Equality : The gender dimensions of the epidemic are recognised by the social partners. Gender discrimination at the workplace is ruled out. Sexual harassment and the exploitation of dependency of women is an offence.
7. Occupational Health and Safety : The work environment must be healthy and safe. Tools which bear the danger of injuries such as cuts should not be shared between workers. In case of accidents which involve blood and body fluid emissions, first aid must be exercised with the use of protective barriers, such as gloves and masks, which prevent direct contact with blood or other body fluids.
8. Prevention and Behaviour Change : Employees with HIV and AIDS shall not be unfairly discriminated against in the allocation of employee benefits. With regard to sick leave, HIV and AIDS related illness will be treated no different from other chronic or life threatening conditions. Health and social security schemes run by the company shall give the same benefits to those with HIV and AIDS as to any other worker. The same applies to separation allowance, retirement schemes and pension benefits.
9. Prevention and Behaviour Change : HIV infection is preventable. The parties will promote prevention efforts at the workplace, within families and in the wider community. Because it is within the power of each individual to avoid HIV infection, it is expected that employees take responsibility of their own health. They are urged to avoid risky behaviour such as unprotected sexual intercourse and the injection of drugs through shared needles.

9.16.3 IMPLEMENTAION

The plan will be implemented onsite through the following:

1. This HIV/AIDS management plan shall be made known and explained to all employees through the distribution of the text as a brochure in the appropriate languages and through meetings.
2. The implementation of this plan includes information and education activities aimed at communicating correct information about HIV/AIDS and eradicating myths in order to eliminate stigma and discrimination.
3. Igolide will organise and if necessary and appropriate with the participation of health professionals, regular awareness and prevention programmes about HIV/AIDS during working time.
4. As condoms and femidoms are an effective barrier to sexually transmitted infections and HIV transmission, condoms and femidoms will be made available at no cost on the construction site.
5. Meetings, information and training activities should be included in an action programme with an implementation plan for a defined period of time. This should include material to be acquired or produced. The company should make provisions in its budgetary process to include the cost of activities and materials.
6. Disputes or grievances arising from the application of the principles of this policy and its implementation are dealt with by the HIV/AIDS Committee and/or in established dispute resolution or grievance procedures.

9.17 SECURITY POLICY

A generic high-level security policy has been compiled for the drafting of this EMPr. Should the project be developed further, a site-specific policy will be produced.

This procedure shall be applicable to all staff working within the project area to comply with the relevant regulations and international standards.

Igolide overarching objective is to protect the people and assets in a way that minimises conflict and respects the human rights of its diverse stakeholders, avoids creating or worsening conflict and address security threats in as peaceful a way as possible. Igolide have adapted the IFC Performance Standards and supporting World Bank Group Environmental, Health and Safety Guidelines as the overarching standards associated with human rights, labour force management, vulnerable groups and stakeholder engagement to guide it towards achievement of appropriately high levels of environmental and social performance throughout the Project's life cycle.

A security company must be employed to guard the site and monitor access and must be registered with the Private Security Industry Regulatory Authority (PSIRA). The company should be utilised for the project life-cycle, alternatively different companies can be used for the construction, operations and decommissioning phases. The choice is at the discretion of the Holder of the EA.

The following guiding principles have been developed for site security:

- All access roads shall be gated to restrict access to the general public. Gates will be required to be kept locked when construction is occurring or when turbine maintenance is not occurring.
- The Contractor, prior to arriving on site, will assess any risks posed by its security arrangements to people within and outside the Project site.
- No firearms allowed on site or in vehicles transporting staff to / from site (unless used by security personnel).
- The Operations and Maintenance Building ("O&M building") shall be locked at all times when Project personnel are not inside.
- The security arrangements must take account of the principles of proportionality and good international practice in relation to hiring, rules of conduct, training, equipping, and monitoring of security;
- The contractor and Holder of the EA:
    - is required to make reasonable inquiries to ensure that those providing security are not implicated in past abuses; and
    - Ensure that the security company is adequately trained in the use of force and appropriate conduct, and they act within the applicable law.
- A grievance mechanism for affected communities shall be provided to express any concerns about security arrangements.

Igolide have adapted the United Nations Basic Principles on the use of Force and Firearms and Voluntary Principles on Security and Human Rights.

9.18 BAT MANAGEMENT PLAN

9.18.1 STEP 1: MINIMISATION OF LIGHT POLLUTION AND ARTIFICIAL HABITAT CREATION

During the planning phase of the WEF, it must become mandatory to only use lights with low sensitivity motion sensors that switch off automatically when no persons are nearby, to prevent the creation of regular insect gathering pools, where practically possible, without compromising security requirements. This applies to the turbine bases (if applicable) and other infrastructure/buildings. Aviation lights should remain as required by aviation regulations. Floodlights should be down-hooded and where possible, lights with a colour (lighting temperature) that attract less insects should be used. This mitigation step is a simple and cost-effective strategy to effectively decrease the chances of bat mortality on site.

Bi-annual visits to the facilities at night must be conducted for the operational lifetime of the facilities by operational staff of the facilities, to assess the lighting setup and whether the passive motion sensors are functioning correctly. The bat specialist conducting the operational bat mortality monitoring must conduct at least one visit to the site during nighttime, to assess the placement and setup of outside lights on the facility. When lights are replaced and maintenance on lights is conducted, this Mitigation Action Plan must be consulted.

The storm water drainage plan must avoid creations of artificial ponds/open water sources or wetlands in turbine zones (less than 300m from any turbine base), as these will increase insect activity and therefore bat activity in the area. This can result in turbines that were previously assessed as having a low risk to be financially and biologically costly high-risk turbines.

9.18.2 STEP 2: APPOINTMENT OF BAT SPECIALIST TO CONDUCT OPERATIONAL BAT MORTALITY MONITORING

As soon as the WEF becomes operational, a bat specialist must start to conduct a minimum of 2 years of operational bat mortality monitoring. This specialist must be appointed before the facility becomes operational, so that the operational monitoring can start at the same time as the commercial operation date of the facility. The methodology of this monitoring must comply with the *South African Good Practice Guidelines for Operational Monitoring for Bats at Wind Energy Facilities - 2nd Edition June 2020* (Aronson *et al.* 2020), or any newer version of the applicable guidelines that may be in force at the start of operation of the facility.

The results of the bat mortality study may be used to develop mitigation measures focused on specific problematic turbines. The results of the operational monitoring must be made available, on request, to other bat specialists conducting operational and pre-construction monitoring on WEFs in South Africa.

9.18.3 STEP 3: CURTAILMENT TO PREVENT FREEWHEELING

Based on high bat activity detected during the 12-month pre-construction study, from 1 October to 31 March every night for the lifetime of the facilities, curtailment must be applied to all turbines by ninety-degree feathering of blades below the **manufacturer's cut-in speed**, so it is exactly parallel to the wind direction and minimises freewheeling blade rotation as much as possible without locking the blades. This can significantly lower probability of bat mortalities. Influence on productivity is minimal since no power is generated below the manufacture's cut-in speed.

9.18.4 STEP 4: ADDITIONAL MITIGATION BY CURTAILMENT OR ACOUSTIC DETERRENTS

If mitigation steps 1 – 3 are followed, and the bat mortality monitoring study detects bat mortalities that are above the sustainable threshold for the WEF, then additional mitigation will need to be implemented to bring bat mortalities to or below the sustainable threshold. According to the *South African Bat Fatality Threshold Guidelines* (MacEwan, *et al.*, Edition 3, April 2020), this threshold is calculated by considering the hectare size of the WEF area of turbine influence and the value of 2% of bats/1ha/year for the ecoregions that the WEF is located in, to give an annual number of sustainable bat mortalities that is acceptable for the WEF. The area of turbine influence of each WEF is dictated by the turbine layout and is a tight fitting polygon around the turbine layout (**Figure 9-5**). The area of turbine influence for the WEF falls within the Highveld Grasslands ecoregion (Olson *et al.*, 2012). In this version of the threshold guidelines, the calculated annual acceptable sustainable threshold of bat mortalities for the WEF is indicated in **Table 9-2** below (MacEwan *et al*. 2020). The threshold is based on values adjusted for biases such as searcher efficiency and carcass persistence. Note that a newer version of the Threshold Guidelines or another similar applicable document may be adopted during the lifespan of the WEF.

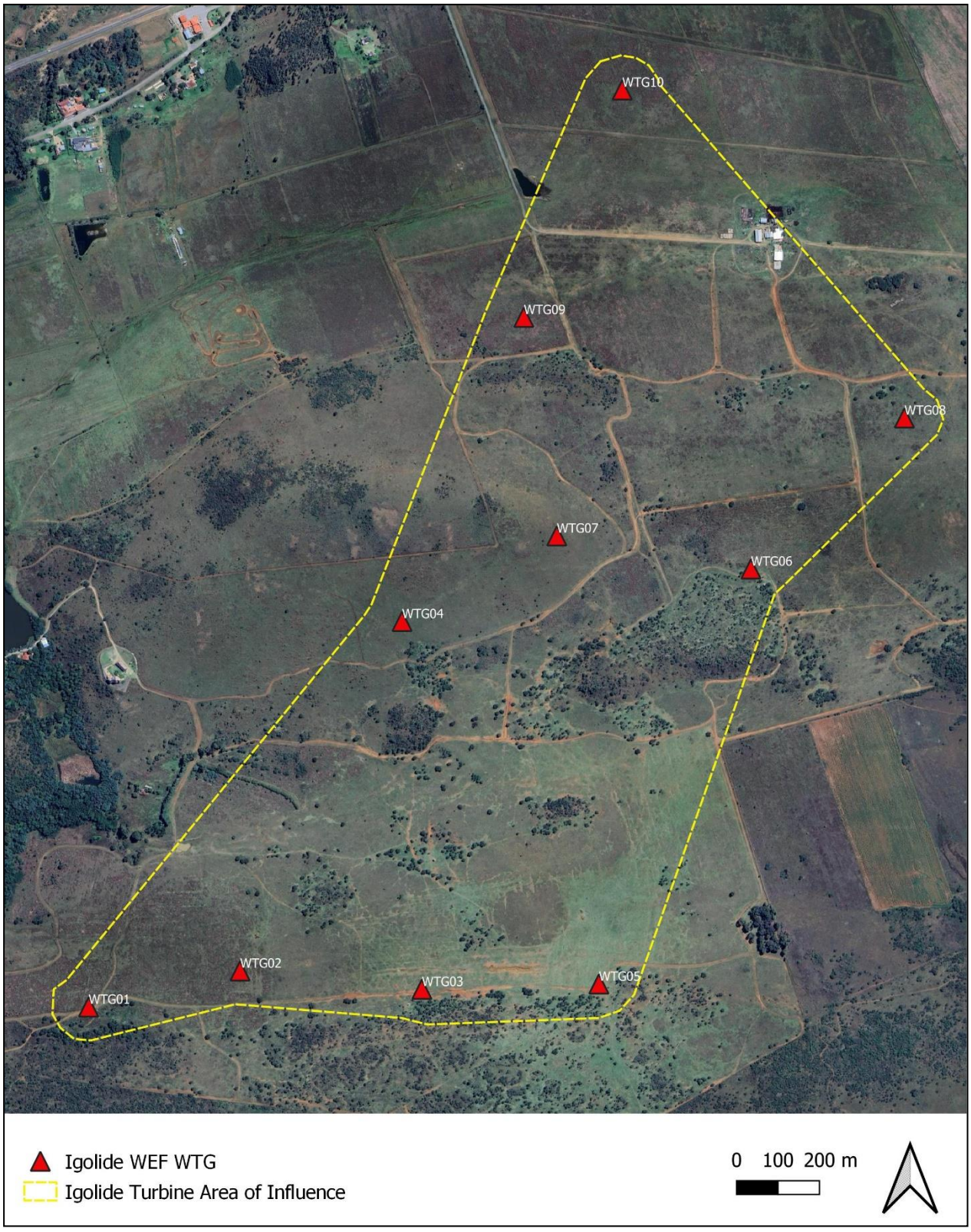


Figure 9-5 - The turbine area of influence for the Igolide WEF used to calculate the area applicable to the acceptable bat mortality thresholds

Table 9-2 - The sustainable acceptable mortality thresholds of the Igolide WEF

	Area of influence of wind turbines (hectares)	Acceptable annual mortality of bats (adjusted values for biases such as searcher efficiency and carcass persistence)
Igolide WEF in Highveld Grassland Ecoregion	251 ha	251 x 0.007842* = 1.96834 = **2 bats (of one species or family per annum)**

* MacEwan *et al*. 2020

Such additional mitigation measures may be to curtail problematic turbines according to the **mitigation cut-in speed** , and/or to utilise acoustic deterrents on problematic turbines. If the turbine layout is amended through an amendment process post EA, the calculation in **Table 9-2** needs to be revised.

Preliminarily, it is advised that any additional mitigation measures that may be required be applied during 1 October to 31 March, and must be applied to any turbines or group of turbines identified as causing the WEF mortalities to be above the sustainable threshold levels. This time period is based on high bat activity months as detected during the 12-month pre-construction studies.

The bat specialist conducting the operational bat monitoring may recommend other time periods for additional mitigation, based on robust mortality data. If required, the bat specialist may make use of new climatic or acoustic data to allow for an active and adaptable mitigation schedule.

9.18.5 STEP 5: AUDITING OF BAT MORTALITIES FOR THE LIFETIME OF THE FACILITY

During the implementation of mitigation Steps 1 – 4, it is crucial for the facility to determine and monitor bat mortalities in order to implement, maintain and adapt mitigations as efficiently and economically as possible. For the duration of the lifetime of the facility, the impacts on bats must be audited/monitored by reliable methods of carcass searching and/or electronic devices capable of automatically counting bat mortalities. Such auditing should occur every 5 years (after the end of the initial 2-year operational study) for all turbines on site.

10 CONCLUSION

Igolide Wind (Pty) Ltd is proposing the development of the 100 MW Igolide WEF, located near Fochville in the Gauteng Province. This S&EIA process considered the biophysical location of the proposed development, as well as a feasibility assessment by the proponent, which inter alia served to identify site options that would be optimal for energy production and grid interconnection. The purpose of the proposed project is to contribute to the national energy targets of diversification of energy supply and the promotion of clean energy. The project will also aid in overcoming the power shortages that are currently faced in the country. Other socio-economic benefits would result from the proposed project, including the increase of energy supply, employment opportunities and local economic development.

It is therefore the opinion of the EAP that provided this project is mitigated, as per the mitigation and management measures outlined in this EMPr, the project will result in impacts that should not negatively affect the environment. It is the applicant's responsibility to ensure that this EMPr is made binding on the contractor by including the EMPr in the contract documentation. The contractor must thoroughly familiarise himself with the requirements of the EMPr and appoint an EO to oversee the implementation of the EMPr on a day-to-day basis. In addition, the applicant must appoint an external ECO to undertake monthly compliance audits during construction against the requirements of the EMPr as well as the EA.

Parties responsible for transgression of this EMPr must be held responsible for any corrective actions that may need to be undertaken. Parties responsible for environmental degradation through irresponsible behaviour/negligence must receive penalties.

WSP is of the opinion that the project can proceed, provided that the outlined mitigation measures of the S&EIA process and this EMPr are implemented effectively.

In terms of NEMA, everyone (i.e. all persons engaging in any component of this project) is required to take reasonable measures to ensure that they do not pollute the environment. 'Reasonable measures' includes informing and educating employees about the environmental risks associated with their work and training them to operate in an environmentally responsible manner.

The Proponent also recognises that, in terms of NEMA, the cost to repair any environmental damage will be borne by the person responsible for the damage. Should the above-mentioned environmental guidelines and mitigation measures be adopted, it is anticipated that the negative environmental impacts of the proposed PV Facility will be mitigated adequately. The Proponent and the selected Contractor shall appoint relevant personnel, as well as an independent ECO, to monitor the site periodically throughout construction to ensure that the required environmental controls are in place and working effectively. During operation and maintenance the area specific Environmental Manager and EO, with the support of the maintenance supervisor, will monitor environmental controls.

Appendix A

EAP CV

Ashlea Strong

Environmental Planning & Advisory, Principal Associate

CAREER SUMMARY

Ashlea is a Principal Associate with 19 years' experience in the environmental field. She currently provides technical and strategic expertise on a diverse range project in the environmental management field, including environmental scoping and impact assessment studies, environmental management plans, waste and water management, as well as the provision of environmental management solutions and mitigation measures. Ashlea has been involved in the management of a number of large EIAs specifically within the energy sector such as the Medupi Power Station, and Pebble-Bed Modular Reactor (PBMR) and numerous Renewable Energy Developments and Transmission Powerlines. She also has significant environmental auditing experience and expertise having undertaken over 70 compliance audits. Ashlea holds a Masters in Environmental Management; a BTech (Nature Conservation), and a National Diploma (Nature Conservation). She is also a Registered Environmental Assessment Practitioner.

Countries of experience gained include South Africa, Mozambique, Zimbabwe and Zambia.

9 years with WSP

19 years of experience

Area of expertise

Auditing

ESIR

Energy

Infrastructure

Mining

Training

Waste Management

Language

English – Fluent

Afrikaans - Fluent

EDUCATION

Masters in Environmental Management, University of the Free State, South Africa	2006
B Tech, Nature Conservation, Technikon SA, South Africa	2001
National Diploma in Nature Conservation, Technikon SA, South Africa	1999

ADDITIONAL TRAINING

Conduct outcomes-based assessment (NQF Level 5), South African Qualifications Authority (SAQA)	2009

PROFESSIONAL MEMBERSHIPS

Registered Environmental Assessment Practitioner (Registration Number: 2019/1005)	2020

Ashlea Strong

Environmental Planning & Advisory, Principal Associate

PROFESSIONAL HISTORY

WSP Group Africa (Pty) Ltd	May 2013 - present
Lidwala Consulting Engineers	April 2010 – April 2013
GIBB	January 2009 – March 2010
Bohlweki Environmental	August 2004 – December 2008
Vuka Environmental	August 2003 – July 2002

PROFESSIONAL EXPERIENCE

Energy Sector

G7 Renewable Energies, Karreebosch Wind Energy Facility Project, Matjiesfontein, Western Cape.
2022-2023
Project Manager
Undertaking of a Part 2 Amendment Process as well as the Amendment of the Environmental Management Programme for a 140MW Wind Energy Facility

G7 Renewable Energies, Karreebosch to Komsberg 132kV Powerline Project, Matjiesfontein, Western Cape.
2022-2023
Project Manager
Compilation of a Basic Assessment and Environmental Management Programme for the 132kV Powerline

Enertrag, Camden Renewable Energy Complex, Ermelo, Mpumalanga.
2021-2023
Project Manager
Compilation of four Environmental Impact Assessments, three Basic Assessments and associated Environmental Management Programmes for the Camden Renewable Energy Complex, including two wind energy facilities, a solar energy facility, one 400kV Gird Connection and three 132kV grid Connections.

Enertrag, Dalmanutha Renewable Energy Complex, Belfast, Mpumalanga.
2022-2023
Project Manager
Compilation of one Environmental Impact Assessment, four Basic Assessments and associated Environmental Management Programmes for the Dalmanutha Renewable Energy Complex, including two wind energy facilities and associated Grid Connections

Enertrag, Mukondeleli and Impumelelo Wind Energy Facilities, Secunda, Mpumalanga.
2022-2023
Project Manager
Compilation of two Environmental Impact Assessments, two Basic Assessments and associated Environmental Management Programmes for the Secunda Renewable Energy Complex, including two wind energy facilities and associated Grid Connections

Red Rocket South Africa Limited, Brandvalley Wind Energy Facility Project, Matjiesfontein, Western Cape.
2021-2022
Project Manager
Undertaking of a Part 2 Amendment Process as well as the Amendment of the Environmental Management Programme for a 140MW Wind Energy Facility

Ashlea Strong

Environmental Planning & Advisory, Principal Associate

Red Rocket South Africa Limited, Bon Espirange to Komsberg 132kV Powerline Project, Matjiesfontein, Western Cape.
2021-2022
Project Manager
Compilation of a Basic Assessment and Environmental Management Programme for the 132kV Powerline

Red Rocket South Africa Limited, Rietkloof Wind Energy Facility Project, Matjiesfontein, Western Cape.
2021-2022
Project Manager
Undertaking of a Part 2 Amendment Process as well as the Amendment of the Environmental Management Programme for a 140MW Wind Energy Facility

Calodex (Pty) Ltd., 100MW Solar Photovoltatic (PV) Plant, Springs in Gauteng, South Africa
2021
Project Director
This project involved the compilation of a Basic Assessment and Environmental Management Plan for a 100MW Solar PV Plant.

Eskom Holdings SOC Limited, Erica 400kV Loop-in-Loop-out (LILO) Powerline, Cape Town, Western Cape, South Africa.
2020
Compilation of an environmental screening assessment for the Erica 400kV LILO Powerline.

BioTherm Energy, Maralla East and West Wind Energy Facilities, Sutherland in the Northern and Western Cape, South Africa.
2019
Project Manager
Compilation of two Part 2 Amendment Process for the changes in technical scope of the Wind Energy Facilities.

Eskom Holdings SOC Limited, Ruigtevallei 132kV Powerline, Gariep in the Free State, South Africa
2019
Project Manager
Compilation of a Part 2 Amendment Process for the deviation of the Ruigtevallei – Dreunberg 132 kV powerline.

Globeleq, Nakonde and Mpika Wind Energy Projects, Zambia
2018
Project Manager
Compilation of two Environmental Project Briefs for the establishment of meteorological masts.

G7 Renewable Energies, Rietkloof Wind Energy Facility Project, Matjiesfontein, Western Cape.
2018
Project Director
Compilation of a Basic Assessment and Environmental Management Programme for a 140MW Wind Energy Facility.

Southern African Power Pool (SAPP), Mozambique – Zambia Interconnector Powerline, Mozambique
2018
Project Manager
This project involved the compilation of the Environmental and Social Impact Assessment and Environmental and Social Management Plan for a 300km 400kV powerline between Tete, in Mozambique, and Chipata, in Zambia.

Eskom Holdings SOC Limited, Ankerlig – Koeberg 132kV powerline walkdown, South Africa
2017

Ashlea Strong

Environmental Planning & Advisory, Principal Associate

Project Manager
This project involved the compilation of a Construction and Operation Environmental Management Plans for the Ankerlig – Koeberg 132kV powerline.

WSP | Parsons Brinckerhoff, Gwanda 100MW Solar Project, Gwanda, Matebeleland South Province, Zimbabwe
2018
Project Manager
This project involved the high-level review of the Environmental Impact Assessment for a 100MW Photovoltaic (PV) Solar Project against relevant legislation and international standards.

WSP | Parsons Brinckerhoff, Southern Energy Coal Fired Power Station, Hwange, Zimbabwe
2016
Project Manager
This project involved the high-level review of the Environmental Impact Assessment for the Southern Energy Coal Fired Power Station against relevant legislation and standards.

BioTherm Energy (Pty) Ltd, Proposed Solar and Wind Projects, Aggenys and Sutherland Northern and Western Cape Provinces, South Africa
2015
Project Manager
This project involved the compilation of 15 Environmental Impact Assessments and Environmental Management Plans for 2 Solar and 2 Wind energy Projects.

Central Energy Fund (CEF), Proposed Solar Park, Northern Cape Province, South Africa
2012
Strategic Environmental Advisor
This project involved the provision of process expertise for the compilation of an Environmental Impact Assessment and Environmental Management Plan for the proposed Solar Park.

Eskom Transmission, Proposed Tabor - Nzhelele 400kV Transmission Lines and associated infrastructure, Limpopo Province, South Africa
2012
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for a 100km 400kV powerline between Louis Trichardt and Musina in the Limpopo Province.

Eskom Holdings SOC Limited, Retrofitting of the existing Electrostatic Precipitators with Fabric Filter Plants at Units 2, 3 and 4 at the Grootvlei Power Station, South Africa
2012
Project Manager
This project involved the compilation of a Basic Assessment Report and Environmental Management Plan for the proposed retrofitting of the existing Electrostatic Precipitators with Fabric Filter Plants at the Grootvlei Power Station.

Parsons Brinkerhoff Africa and Mulilo Power, Proposed Mulilo Coal Fired Power Station and associated infrastructure as well as associated power lines and substations, Musina, Limpopo, South Africa
2008
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Eskom Generation, Pebble Bed Modular Reactor Demonstration Plant and Associated Infrastructure, Western Cape, South Africa

Ashlea Strong

Environmental Planning & Advisory, Principal Associate

2008
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Eskom Transmissions, Proposed Bantamsklip – Kappa 765 kV Transmission Lines and associated infrastructure, Karoo, Western and Northern Cape, South Africa
2008
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for four 260km 765kV powerlines between the Bantamsklip Nuclear Power Station Site and the proposed new Kappa Substation.

Eskom Transmission Proposed Bantamsklip – Bacchus, Bacchus - Kappa and Bacchus – Muldersvlei 400 kV Transmission Lines and associated infrastructure, Western and Northern Cape, South Africa
2008
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Eskom Distribution – Central region.Westgate – Tarlton – Kromdraai 132 kV Sub-Transmission line and associated infrastructure, Gauteng, South Africa
2008
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Eskom, Environmental Scoping Study for the proposed new distribution line and substation, Dundonald, Mpumalanga, South Africa
2008
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for a 132kV powerline as well as a new substation in the Tarlton area of Gauteng. Also involved in the Public Participation Process.

Eskom Distribution, The proposed new 132 kV sub-transmission line between the Dinaledi and GaRankuwa substations for Eskom, GaRankuwa, Northwest, South Africa
2008
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Eskom, Transmission Expansion of the Transmission powerline network and associated infrastructure between the Perseus substation and the Beta substation, Free State, South Africa
2008
Project Manager
This project involved the compilation of an alignment specific construction Environmental Management Plan for the 13km 765kV Perseus Beta Turn-ins.

Eskom Distribution – Central Region, Tarlton – Kromdraai 132 kV Sub-Transmission line and associated infrastructure, Gauteng, South Africa
2008
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Ashlea Strong

Environmental Planning & Advisory, Principal Associate

Eskom Distribution – Central Regio, Basic Assessment for the proposed Watershed – Mmabatho 88kV Power line. Northwest, South Africa
2008
Project Manager
This project involved the compilation of a Basic Assessment and Environmental Management Plan.

Eskom Distribution – Central Region, Proposed Watershed – Mmabatho 88kV Power line. Northwest, South Africa
2007
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Eskom Holdings SOC Limited, Proposed Combined Cycle Gas Turbine Plant and Associated Infrastructure near Majuba, Mpumalanga, South Africa
2007
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Eskom Generation, Proposed Capacity Increase of the Atlantis OCGT Plant and Associated Infrastructure, Western Cape, South Africa
2006
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Eskom Holdings SOC Limited, Proposed Concentrated Solar Thermal Plant in the Northern Cape, South Africa
2006
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Eskom Holdings SOC Limited, Proposed Underground Coal Gasification plant, Eskom, Mpumalanga, South Africa
2006
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Eskom Generation, Proposed new Coal-fired Power Station in the Lephalale Area for Eskom, Limpopo, South Africa
2005
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Eskom Generation, Proposed Open Cycle. Gas Turbine Power Station at Atlantis for Eskom, Western Cape, South Africa
2005
Environmental Consultant
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Infrastructure Sector

Ashlea Strong

Environmental Planning & Advisory, Principal Associate

Sasol South Africa Limited, Boegoebaai Green Hydrogen Project, Northern Cape, South Africa
2022-2023
Project Manager
This project involved the compilation of an High level Environmental Screening for the Project, in preparation future Environmental Impact Assessment Processes

Enertrag, Hendrina Green Hydrogen and Ammonia Facility, Mpumalanga, South Africa
2022-2023
Project Director
This project involved the undertaking of an Environmental Impact Assessment, including the compilation of an Environmental Management Programme

Enertrag, Camden Green Hydrogen and Ammonia Facility, Mpumalanga, South Africa
2021-2023
Project Director
This project involved the undertaking of an Environmental Impact Assessment, including the compilation of an Environmental Management Programme

Anglo American, Emalahleni Water Treatment Plant Amendment Project (EWRP), Emalahleni, Mpumalanga, South Africa.
2020
Project Manager
Compilation of a Part 1 Amendment Process for the changes to the EWRP Environmental Authorisation as well as an update of the Environmental Management Programme.

Eskom Holdings SOC Limited, Hendrina Leachate Dam, South Africa
2018
Project Manager
This project involves the compilation of a Basic Assessment and Environmental Management Plan for a leachate Dam at the Domestic Waste Landfill Site at the Hendrina Power Station.

S**ANRAL, Rehabilitation of the R34 between Vryburg and Schweizer-Reneke, Vryburg and Schweizer-Reneke, Northwest, South Africa**
2016
Project Manager
This project involved the compilation of a Basic Assessment and Environmental Management Plan.

Envirocin Incineration Systems CC, Proposed Expansion of the Cremation Facilities at the Envirocin Pet Crematorium, Kyasands, Gauteng, South Africa
2013
Project Manager
This project involves the compilation of a basic assessment for the expansion of the cremation facilities.

Industrial Development Corporation of SA (Pty) Ltd, Proposed Kraft Paper Mill in Frankfort, Frankfort, Free State, South Africa
2013
Project Manager
This project involved the undertaking of an Environmental Impact Assessment, including the compilation of an Environmental Management Programme.

SANRAL, Rehabilitation of the N14 between Delerayville and Sannieshof, Northwest, South Africa
2011
Project Manager
This project involved the compilation of a Basic Assessment and Environmental Management Plan as well as the construction of a new bridge over the Hartsriver. This project also included the compilation of Water Use License and Mining Permit Applications.

Ashlea Strong

Environmental Planning & Advisory, Principal Associate

Makhado Municipality, Proposed new Waterfall Cemetery, Limpopo, South Africa
2011
Project Manager
This project involved the compilation of a Basic Assessment and Environmental Management Plan.

Johannesburg Roads Agency, Route determination of the proposed Metro Boulevard, Weltevreden Park Area, Gauteng, South Africa
2008
Project Manager
This project involved the undertaking of an Environmental Impact Assessment.

Eskom Generation, Proposed new fuel supply pipeline between Milnerton and Atlantis, Western Cape, South Africa
2007
Project Manager
This project involved undertaking an Environmental Impact Assessment for the proposed new fuel supply pipeline between Milnerton and Atlantis to supply the Ankerlig Power Station.

Mining Sector

Rietvlei Mining Company, Establishment of the Proposed Rietvlei Opencast Coal Mine, Middelburg, Mpumalanga, South Africa
2013
Project Manager
This project involves the undertaking of an integrated environmental authorisation process, including an Environmental Impact Assessment, Environmental Management Programme Report, Waste Management License Application and Water Use License Application.

AngloGold Ashanti, Decommissioning of Redundant Infrastructure at the Vaal River Operations, Northwest and Free State, South Africa
2013
Project Manager
This project involves undertaking an integrated Environmental Authorisation and Waste Management License process for the proposed decommissioning of redundant infrastructure.

AngloGold Ashanti (Pty) Ltd, Decommissioning of Redundant Infrastructure at the West Wits Operations, Gauteng, South Africa
2013
Project Manager
This project involves undertaking a Basic Assessment process for the proposed decommissioning of redundant infrastructure.

Exxaro Coal (Pty) Ltd Inyanda Mine Pegasus South Expansion, Middelburg, Mpumalanga, South Africa
2011
Project Manager
This project included the compilation of an Environmental Impact Assessment, Environmental Management Plan, the Amendment of the existing Environmental Management Programme Report and the amendment of the existing Water Use License.

Sishen Iron Ore (Pty) Ltd, Sishen Infrastructure Program, Northern Cape, South Africa
2010
Project Manager
This project involved the compilation of an Environmental Impact Assessment and an Environmental Management Plan for the infrastructure expansion programme.

Sound Mining Solutions, Prospecting Permit Applications in the Kuruman area of the Northern Cape, South Africa

Ashlea Strong

Environmental Planning & Advisory, Principal Associate

2011
Project Manager
This project involved the compilation of Environmental Management plans as part of six applications for Prospecting Permits.

Limpopo Department of Roads and Transport, Borrow pits required by the Limpopo Department of Roads and Transport, Limpopo, South Africa
2010
Project Manager
This project involved the compilation of Environmental Management plans as part of the applications for Mining Permits for borrow pits required for the rehabilitation of provincial roads.

Eskom Generation, Borrow pits required for the Medupi Coal Fired Power Station, Limpopo, South Africa
2008
Project Manager
This project involved the compilation of Environmental Management plans as part of the applications for Mining Permits for borrow pits.

Eskom Generation. Borrow pits required for the Ingula Pumped Storage Scheme, KwaZulu-Natal, South Africa
2008
Project Manager
This project involved the compilation of Environmental Management plans as part of the applications for Mining Permits.

Eskom Generation Project Manager, Mining Right Application for a 23 Hectare Borrow Pit required for the Steelpoort Pumped Storage Scheme, Mpumalanga, South Africa
2007
Project Manager
This project entailed the compilation of the required Environmental Management Programme Report in support of a Mining Right Application.

Minexpo, Renewed Mining and Prospecting Activities on the farm Quaggaskop 215, Vanrhynsdorp, Western Cape, South Africa
2004
Environmental Consultant
This project involved the compilation of an Environmental Management Programme Report for the recommencement of mining and prospecting activities.

Waste Management

Sasol Secunda Operations, Sasol Waste Management Environmental Management Programme, Secunda, South Africa
2019
Project Manager
Compilation of an operational Environmental Management Programme for the Sasol Waste Ash Facility, Charlie 1 Disposal Facility and the Waste Recycling Facility.

Eskom Holdings SOC Limited, Proposed continuous Ashing at Majuba Power Station, Mpumalanga, South Africa
2012
Project Manager
This project entailed the compilation Environmental Impact Assessment and Waste Management License Application for the proposed continuous ashing project at the Majuba Power Station in Mpumalanga.

Ashlea Strong

Environmental Planning & Advisory, Principal Associate

Eskom Holdings SOC Limited, Proposed continuous Ashing at Tutuka Power Station, Mpumalanga, South Africa
2012
Project Manager
This project entailed the compilation Environmental Impact Assessment and Waste Management License Application for the proposed continuous ashing project at the Tutuka Power Station in Mpumalanga.

Hendrina Power Station, Proposed extension of Ash Dams at Hendrina Power Station, Mpumalanga, South Africa
2011
Project Manager
This project entailed the compilation Environmental Impact Assessment and Waste Management License Application for the proposed extension of the ash dams at the Hendrina Power Station in Mpumalanga.

Coega Development Corporation, Phase 1 of the Environmental Impact Assessment for the Proposed Regional General and Hazardous Waste Processing Facility, Eastern Cape
2005
Project Manager
This project entailed the compilation Environmental Impact Assessment for the Proposed Regional General and Hazardous Waste Processing Facility in the Eastern Cape.

Auditing

Sasol Chemical Industries, Secunda Synfuels Operations Waste Management License Audits for the Sasol Secunda, Mpumalanga, South Africa
2014 – 2021
Lead Auditor
These projects involve the annual and biannual environmental compliance auditing of the Waste Management licenses for various waste facilities

South 32. Compliance Audits at South 32, Mpumalanga, South Africa
2016 – 2020
Project Manager
This project involved the environmental compliance audits of the Water Use Licenses for the BMK, Douglas, Klipfontein and Middelburg Mine North and South Sections at South 32 in Mpumalanga.

South 32, Compliance Audits at Middelburg Water Reclamation Plant (MWRP), Mpumalanga, South Africa
2016 – 2020
Project Manager
This project involved the environmental compliance audits of the Water Use License and Waste Management License for the MWRP at South 32 in Mpumalanga.

Nedbank, BioTherm Round 4 Lenders Technical Advisor, South Africa
2018 – 2021
Project Manager – Environmental
Environmental monitoring of the construction of the Konkoonsies II and Aggeneys Photovoltaic Solar Plants against the IFC Performance Standards.

Eskom Holdings SOC Limited, Water Use Licence Audits, Delmas, Mpumalanga, South Africa
2019
Lead Auditor
External compliance audits of the water use licences for the Delmas and Argent Powerlines in Mpumalanga.

Sasol Oil (Pty) Ltd, Sasol Alrode and Pretoria West Depot Audits, Pretoria, South Africa
2016 – 2020
Lead Auditor

Ashlea Strong

Environmental Planning & Advisory, Principal Associate

Environmental compliance audits for environmental authorisations and environmental management plans for the Sasol Alrode and Pretoria West Depots.

Sasol Oil (Pty) Ltd, Sasol Regulation 34 Audits, South Africa
2019
Lead Auditor
Environmental compliance audits for 13 authorisations for the Sasol Owned Petrol Filling Stations.

Anglo American Platinum. Regulation 34 Audits at Mogalakwena Mine, Limpopo Province, South Africa
2019
Project Manager
Environmental compliance audits of the EMPR and various environmental authorisations at the Mogalakwena Mine.

Sasol Secunda Operations, Sasol Environmental Authorisations and Environmental Management Plans for the Secunda Operations, Secunda, South Africa
2019
Lead Auditor
Environmental compliance audits for 49 authorisations for the Sasol Secunda.

Palabora Company, Waste Management Licence Compliance Audit and PCB Plan Close Out Audit, Phalaborwa, Limpopo, South Africa
2019
Project Manager
Environmental compliance audit of a WML and the PCB Plan for the Palabora Mine.

Sasol Mining, Water Use Licence Compliance, Secunda, South Africa
2018
Project Manager
Environmental compliance audit of six WULs held by mining operations.

South 32, Legal Assessment at South 32, Klipfontein and Middelburg Mine North and South Sections at South 32 in Mpumalanga, South Africa

2019
Project Manager and Lead Auditor
This project involved the assessment of legal compliance against the mine's legal register.

Investchem (Pty) Ltd, InvestChem Annual Environmental Compliance Monitoring, Kempton Park, Gauteng, South Africa
2013 – 2019
Lead Auditor
This project involved the annual environmental compliance auditing for InvestChem's Sulphonation Plant. The monitoring included InvestChem's compliance to various commitments contained in their environmental management programmes and conditions within their environmental authorisations (records of decision).

Sasol Oil (Pty) Ltd, Compliance Audits at Sasol Alrode and Pretoria West Depots, Gauteng, South Africa
2015 – 2019
Project Manager and Lead Auditor
Annual Environmental compliance auditing of the Environmental authorisations at the Alrode and Pretoria West Depots in Gauteng.

Eskom Holdings, Water Use Licence for the Letabo Power Station, Free State, South Africa
2018
Project Manager

Environmental compliance audit of the WUL held by Eskom Letabo Power Station.

Seriti Coal, Compliance Audits at Kriel Colliery, Kriel, Mpumalanga, South Africa
2018
Project Manager
This project involved the environmental compliance audits of the Water Use Licenses.

South 32, Legal Assessment at South 32, Mpumalanga, South Africa
2017
Project Manager and Lead Auditor
This project involved the assessment of legal compliance against the mine's legal register for the BMK, Douglas, Klipfontein and Middelburg Mine North and South Sections.

South 32, EMPR Performance Assessment Report at South 32, Mpumalanga, South Africa
2016
Project Manager
This project involved the formal assessment and verification of the Environmental Management Programme Report for the BMK, Douglas, Klipfontein and Middelburg Mine North and South Sections.

ACWA Power, Solafrica Bokpoort CSP Power Plant (Pty) Ltd. Compliance Audit for the Bokpoort Concentrating Solar Power (CSP) Facility, Groblershoop, Northern Cape, South Africa
2016
Lead Auditor
This project involved the environmental compliance auditing of the Waste Management License, Environmental Authorisation and Water Use License.

Anglo Thermal Coal, EMPR Performance Assessment Report for the Landau Colliery, Mpumalanga, South Africa
2013
Auditor
This project involved the formal assessment and verification of the Landau Colliery Environmental Management Programme Report, conducted in accordance with Regulation 55 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002).

AfriSam Southern Africa (Pty) Ltd, Waste Management License Audit for the Slagment Operation, Vanderbijlpark, Gauteng, South Africa
2013
Lead Auditor
This project involved the annual environmental compliance auditing for AfriSam's Slagment Operation in Vanderbijlpark in Gauteng Province. The audit included AfriSam's compliance to the conditions of their waste management license.

Anglo American Thermal Coal, EMPR Performance Assessment Report for the New Vaal Colliery, Free State, South Africa
2006 – 2007
Auditor
This project involved the formal assessment and verification of the New Vaal Colliery Environmental Management Programme Report, conducted in accordance with Regulation 55 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002).

Environmental Control

Wood South Africa (on behalf of Sasol South Africa Limited), Clean Fuels Projects (EHN & MFO, Large Tanks) Project, Secunda
2022-2024
Project Director

Ashlea Strong

Environmental Planning & Advisory, Principal Associate

This project involved the monthly auditing of the contractor's compliance with the conditions of the environmental authorisation and environmental management plan for the Sasol Clean Fuels Projects in Secunda.

SANRAL.N14, rehabilitation between Sannieshof and Delareyville, Northwest, South Africa
2012
Environmental Control Officer
This project involved the monthly auditing of the contractor's compliance with the conditions of the approved Environmental Management Plan as well as ad hoc environmental advise to the Project Engineer and SANRAL.

Victor Khanye Municipality. Delmas and Bontleng Wastewater Treatment Works, Mpumalanga, South Africa
2009
Environmental Control Officer
This project involved a once off compliance audit of the above-mentioned Wastewater Treatment Works.

Mkhondo Local Municipality. Nkonjaneni Water Borne Sewer Project in Piet Retief, Mpumalanga, South Africa
2009
Environmental Control Officer
This project involved the monthly auditing of the contractor's compliance with the conditions of the approved Environmental Management Plan as well as ad hoc environmental advise to the Project Engineer.

ERWAT, Upgrading of the Waterval Water Care Works, Gauteng, South Africa
2005 – 2007
Environmental Control Officer
This project involved the monthly auditing of the contractor's compliance with the conditions of the approved Environmental Management Plan.

City of Tshwane Lotus Gardens, Ext 2 Township establishment, Gauteng, South Africa
2003
Environmental Control Officer
This project involved the monthly auditing of the contractor's compliance with the conditions of the approved Environmental Management Plan.

Training

SANRAL, N14 rehabilitation between Sannieshof and Delareyville, Northwest, South Africa
2012
Project Manager
This project involved the provision of training for the staff of the N14 rehabilitation project with regards to the contents of the environmental management plan.

Mintek, Training in Environmental Aspects and Rehabilitation for the Small-Scale Mining Division of Mintek, City, Province, South Africa
2004
Trainer
This project involved the provision of environmental awareness training for delegates involved in the small-scale miner training programme run by the Mintek small scale mining division.

Transwerk, Training in Environmental Aspects and Impacts, Germiston, Gauteng, South Africa
2004
Trainer
This project involved the provision of environmental aspects and impacts training for the staff of Transwerk in Germiston.

Environmental Assessment Practitioners Association of South Africa

Registration No. 2019/1005

Herewith certifies that

Ashlea Strong

is registered as an

Environmental Assessment Practitioner

Registered in accordance with the prescribed criteria of Regulation 15. (1) of the Section 24H Registration Authority Regulations (Regulation No. 849, Gazette No. 40154 of 22 July 2016, of the National Environmental Management Act (NEMA), Act No. 107 of 1998, as amended).

Effective: 01 March 2023

Expires: 29 February 2024

Chairperson

Registrar

SAQA
SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIVERSITEIT VAN DIE VRYSTAAT

UNIVERSITY OF THE FREE STATE

HIERMEE WORD VERKLAAR DAT DIE THIS IS TO CERTIFY THAT THE

Magister in Omgewingsbestuur
Magister in Environmental Management

TOEGEKEN IS AAN
HAS BEEN CONFERRED UPON

ASHLEA-ROBYN STRONG

Met effek vanaf with effect from
1 Februarie / February 2006

NADAT AAN DIE STATUTE EN REGULASIES VAN DIE UNIVERSITEIT VOLDOEN IS. AS BEWYS DAARVAN PLAAS ONS ONS ONDERSKEIE HANDTEKENINGE EN DIE SEëL VAN DIE UNIVERSITEIT HIERONDER.

IN ACCORDANCE WITH THE STATUTES AND REGULATIONS OF THE UNIVERSITY. AS WITNESS OUR RESPECTIVE SIGNATURES AND THE SEAL OF THE UNIVERSITY BELOW.

VISEKANSELIER/VICE-CHANCELLOR

DEKAAN/DEAN

REGISTRATEUR/REGISTRAR

BLOEMFONTEIN
2006-04-25
2003049109

TECHNIKON SA

THE DEGREE
BACCALAUREUS TECHNOLOGIAE

NATURE CONSERVATION

Is awarded to

ASHLEA-ROBYN STRONG

Date of Birth

1976/09/03

Student Number

95104199

with effect from

2001/03/01

Registrar

Principal / Vice Chancellor

No. B 3443

Issued with the approval of the Certification Council for Technikon Education (SERTEC) in terms of section 9 of the Certification Council for Technikon Education Act, 1986 (Act 88 of 1986).

TECHNIKON SA

NASIONALE DIPLOMA

NATIONAL DIPLOMA

NATUURBEWARING — **NATURE CONSERVATION**

Toegeken aan — Awarded to

ASHLEA-ROBYN MULLETT

ID: 7609030131081

met ingang van — with effect from

1999/03/01

Die volgende is voltooi: (*dui onderskeiding aan)	The following were completed: (*indicates distinction)
PLANTESTUDIES I *	**PLANT STUDIES I ***
PLANTESTUDIES II *	**PLANT STUDIES II ***
PLANTESTUDIES III	**PLANT STUDIES III**
DIERESTUDIES I *	**ANIMAL STUDIES I ***
DIERESTUDIES II	**ANIMAL STUDIES II**
DIERESTUDIES III	**ANIMAL STUDIES III**
BEWARINGSEKOLOGIE I *	**CONSERVATION ECOLOGY I ***
BEWARINGSEKOLOGIE II *	**CONSERVATION ECOLOGY II ***
BEWARINGSEKOLOGIE III *	**CONSERVATION ECOLOGY III ***
HULPBRONBESTUUR I	**RESOURCE MANAGEMENT I**
HULPBRONBESTUUR II	**RESOURCE MANAGEMENT II**
HULPBRONBESTUUR III	**RESOURCE MANAGEMENT III**
BEWARINGSKOMMUNIKASIE I	**CONSERVATION COMMUNICATION I**
BEWARINGSKOMMUNIKASIE II	**CONSERVATION COMMUNICATION II**
BEWARINGSONTWIKKELING I	**CONSERVATION DEVELOPMENT I**
BEWARINGSADMINISTRASIE I	**CONSERVATION ADMINISTRATION I**
REKENAARGEBRUIK I *	**COMPUTER USAGE I ***
GRONDKUNDE I	**SOIL SCIENCE I**

((V) Dui vakke vrygestel aan)

((E) Indicates subjects exempted)

Registrateur / Registrar

Rektor / Principal
Visekanselier / Vice Chancellor

Nr. / No. D 15019

Uitgereik met die goedkeuring van die Sertifiseringsraad vir Technikononderwys (SERTEC) ingevolge artikel 9 van die Wet op die Sertifiseringsraad vir Technikononderwys, 1986 (Wet 88 van 1986).
Issued with the approval of the Certification Council for Technikon Education (SERTEC) in terms of section 9 of the Certification Council for Technikon Education Act, 1986 (Act 88 of 1986).

Appendix B

EAP DECLARATION OF INTEREST AND OATH UNDERTAKING

APPENDIX 10
DECLARATION OF THE EAP

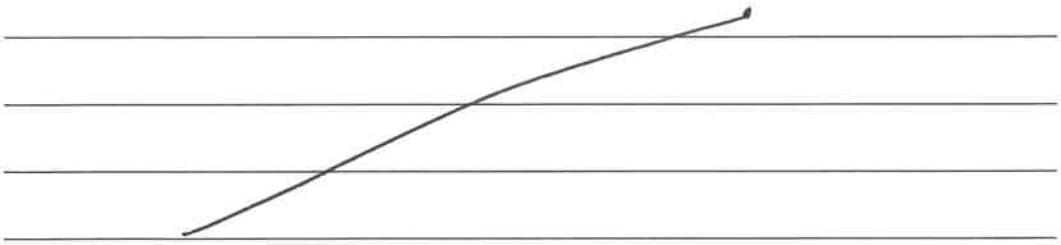
I, Ashlea Strong, declare that –

- I act as the independent environmental assessment practitioner in this application;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I will take into account, to the extent possible, the matters listed in Regulation 13 of the Regulations when preparing the application and any report relating to the application;
- I undertake to disclose to the applicant and the Competent Authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the Competent Authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the Competent Authority, unless access to that information is protected by law, in which case it will be indicated that such information exists and will be provided to the Competent Authority;
- I will perform all obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I am aware of what constitutes an offence in terms of Regulation 48 and that a person convicted of an offence in terms of Regulation 48(1) is liable to the penalties as contemplated in Section 49B of the Act.

Disclosure of Vested Interest (delete whichever is not applicable)

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;

- ~~I have a vested interest in the proposed activity proceeding, such vested interest being~~:



Signature of the environmental assessment practitioner

WSP Group Africa (Pty) Ltd

Name of company:

22/06/2023

Date

APPENDIX 10

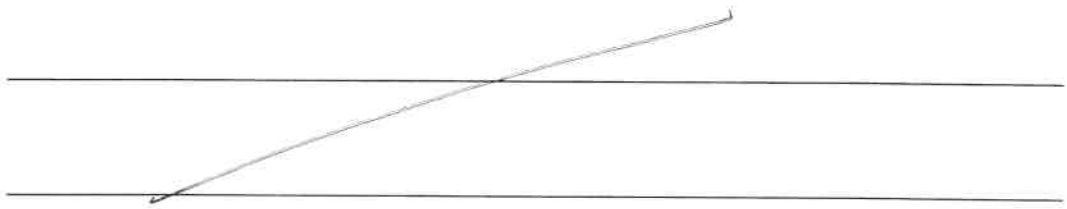
DECLARATION OF THE EAP

I, Ashlea Strong, declare that –

- I act as the independent environmental assessment practitioner in this application;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I will take into account, to the extent possible, the matters listed in Regulation 13 of the Regulations when preparing the application and any report relating to the application;
- I undertake to disclose to the applicant and the Competent Authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the Competent Authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the Competent Authority, unless access to that information is protected by law, in which case it will be indicated that such information exists and will be provided to the Competent Authority;
- I will perform all obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I am aware of what constitutes an offence in terms of Regulation 48 and that a person convicted of an offence in terms of Regulation 48(1) is liable to the penalties as contemplated in Section 49B of the Act.

Disclosure of Vested Interest (delete whichever is not applicable)

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;
- ~~I have a vested interest in the proposed activity proceeding, such vested interest being~~:



Signature of the environmental assessment practitioner

WSP Group Africa (Pty) Ltd

Name of company:

24 October 2023

Date

APPENDIX 12

UNDERTAKING UNDER OATH/ AFFIRMATION

I, Ashlea Strong, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Environmental Assessment Practitioner

WSP Group Africa (Pty) Ltd
Name of Company

24/10/2023
Date

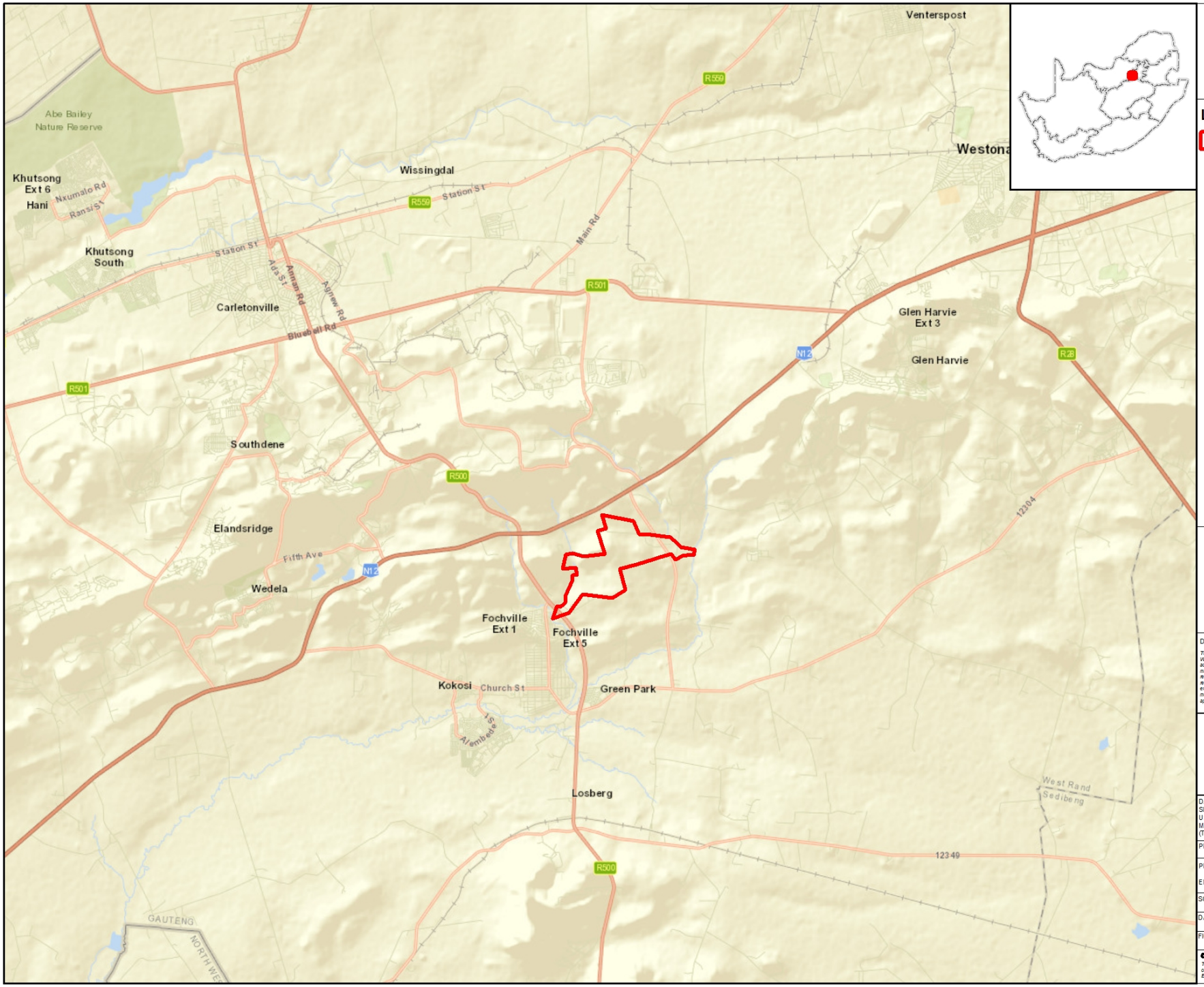
Signature of the Commissioner of Oaths

24 Oct 2023.
Date

change was not ad to the original document.
Date 24 Oct 2023.

Appendix C

MAPS



IGOLIDE WEF

LOCALITY

Legend

WEF Project Area

N

0 1 600 3 200 4 800 6 400

Metres

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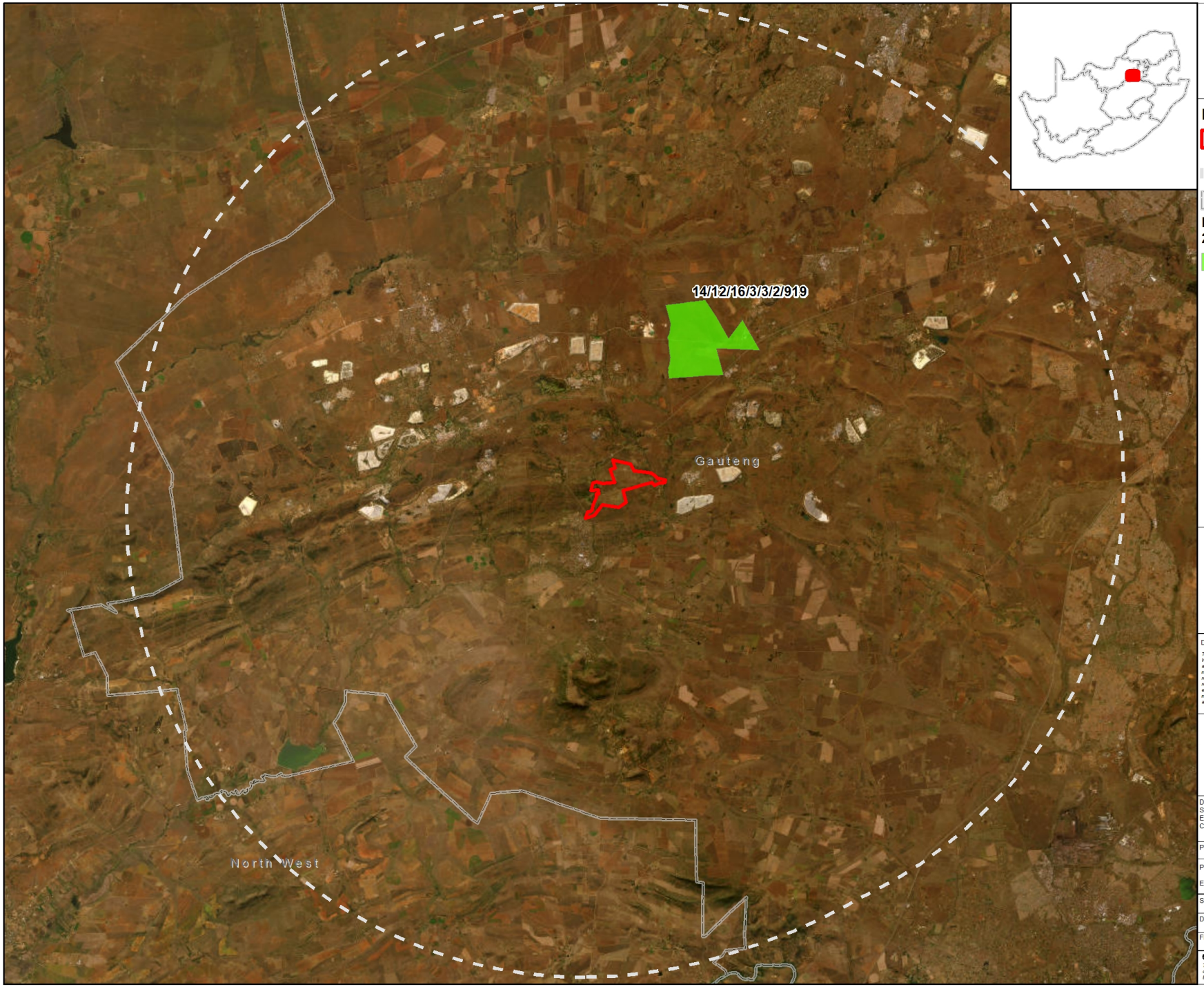
DATA SOURCE:
SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, GARMIN, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), NGCC, (C) OPENSTREETMAP CONTRIBUTORS,

PROJECTION: Hartebeesthoek94 Lo27

PROJECT TITLE:

ENERTRAG EGOLI AND IGOLIDE

SCALE: 1:180 000	DRAWN BY: TS
DATE: 2023/06/21	REVIEWED BY: LN
FIGURE NO:	PROJECT NO: 41104282 REV:



IGOLIDE WEF

RENEWABLE PROJECTS

Legend

- WEF Project Area
- WEF Project Area (buffer 30km)
- Provinces

Project Status (REEA, 2023 Q1)

- Approved

N

0 2,800 5,600 8,400 11,200

Metres

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DATA SOURCE:
SERVICE LAYER CREDITS: SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY

PROJECTION: Hartebeesthoek94 Lo27

PROJECT TITLE:

ENERTRAG EGOLI AND IGOLIDE

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DATE: 2023-06-22	REVIEWED BY: MG
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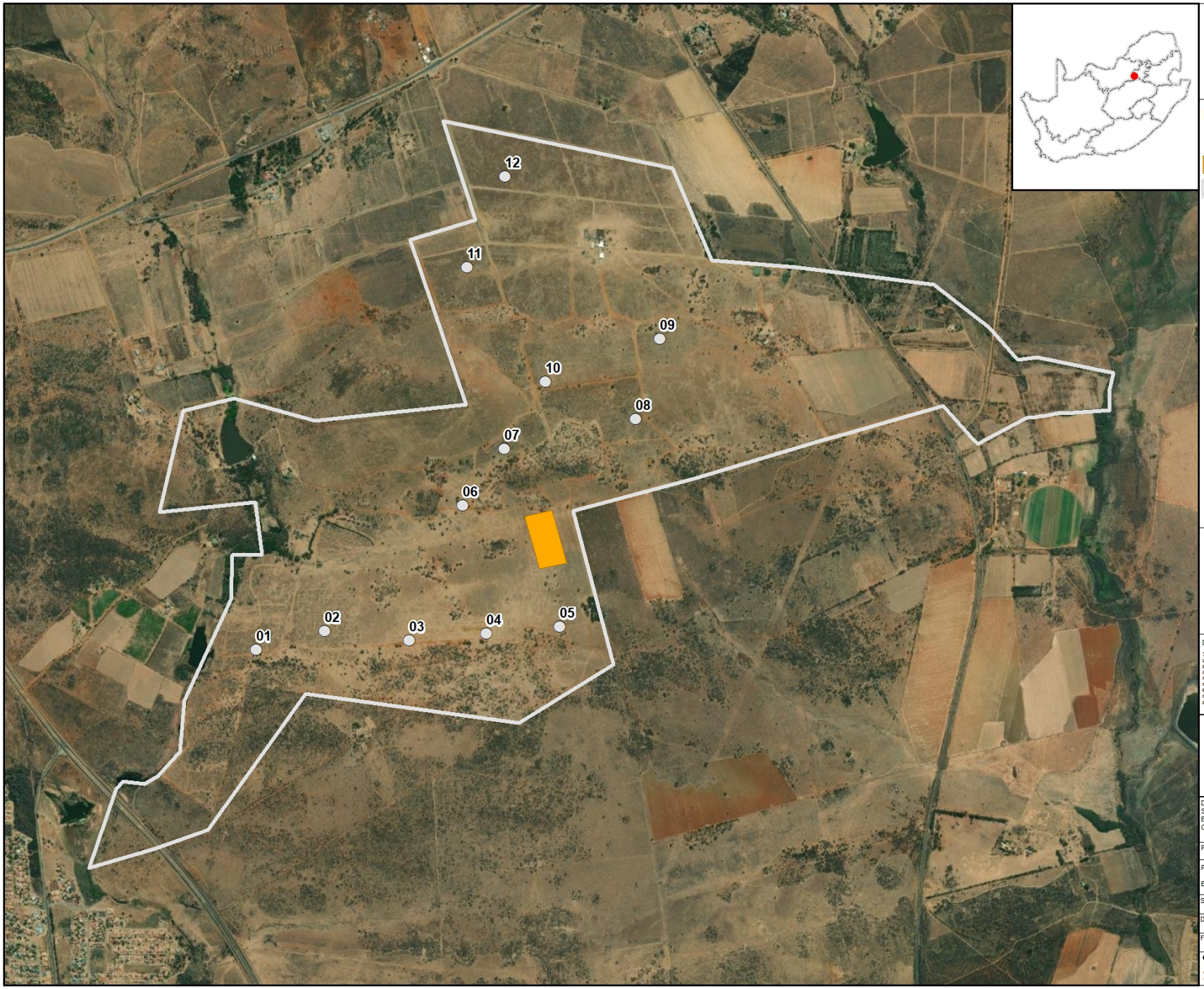

IGOLIDE WEF

LAYOUT

Legend

- Turbines
- IPP Substation
- WEF Project Area

N

0 225 450 675 900

Metres

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DATA SOURCE:
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PROJECTION: Hartebeesthoek94 Lo27

PROJECT TITLE:

ENERTRAG EGOLI AND IGOLIDE

SCALE: 1:25 000	DRAWN BY: TS
DATE: 2023/06/21	REVIEWED BY: LN

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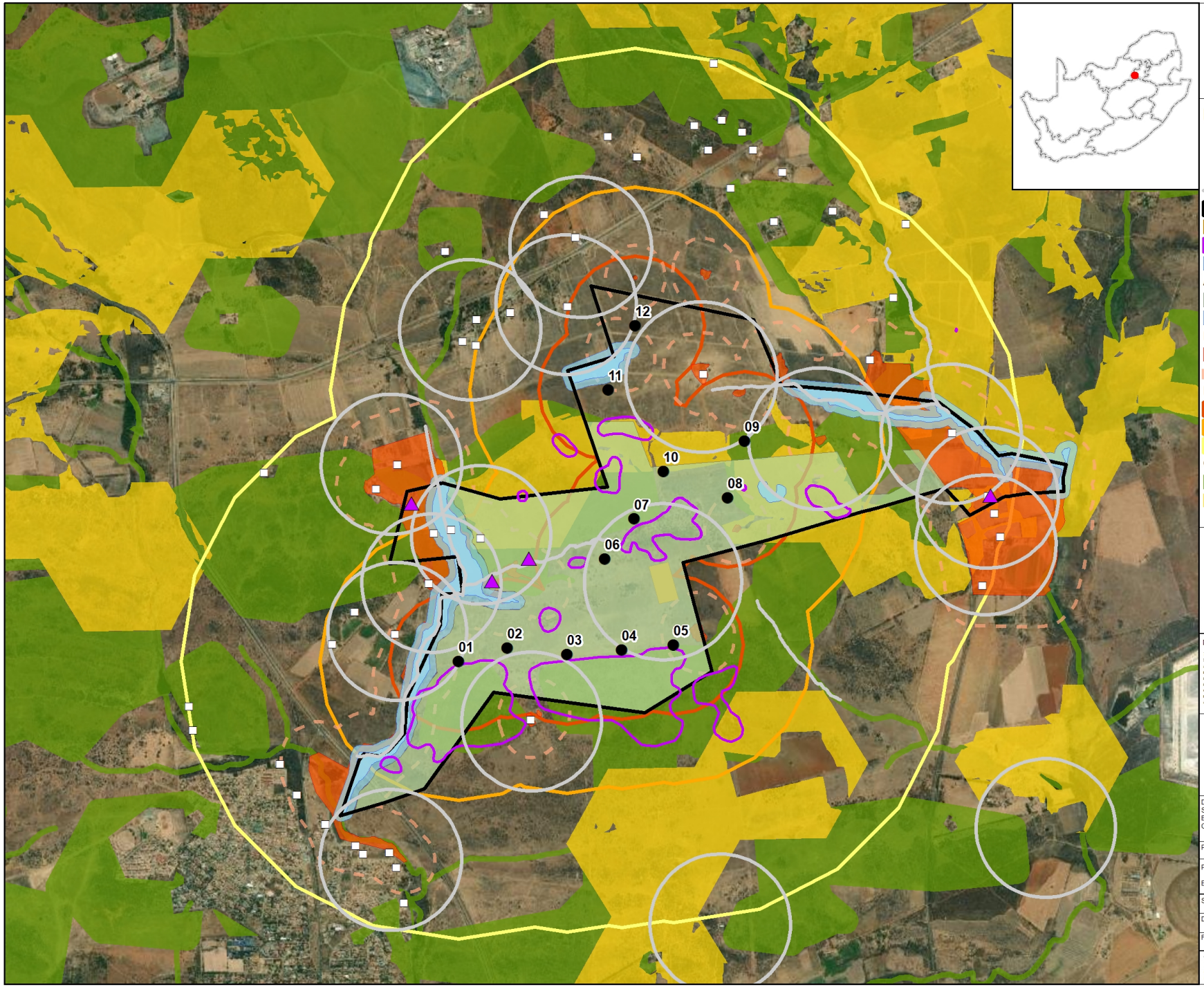

IGOLIDE WEF

SENSITIVITIES

Legend

- Heritage Sites
- Noise Receptors
- Turbines
- Risk buffer
- WEF Project Area
- IPP Substation
- Heritage Sensitive Areas
- Biodiversity Sensitive Areas

Avifauna Sensitivities

- Natural grassland
- Wetlands buffer

Bat Sensitivities

- High
- High, buffer - 200m

Noise Buffers

- Buffer - 500 m
- Buffer - 1000m
- Buffer - 2000m

Gauteng C-Plan 3.3 (2011)

- Ecological Support Area
- CBA Important Area

N

0 310 620 930 1,240

Metres

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PROJECTION: Hartebeesthoek94 Lo27

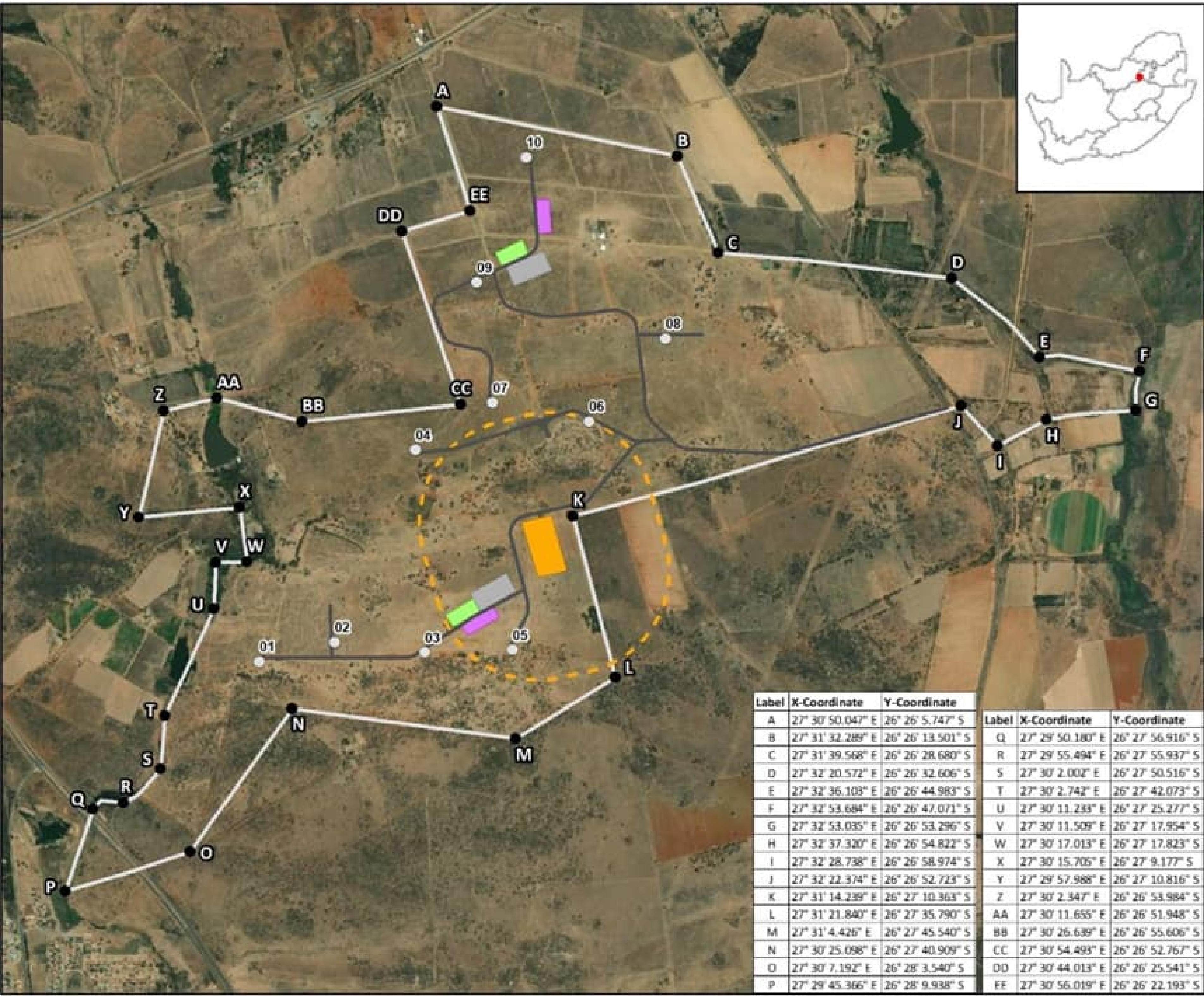
PROJECT TITLE:

ENERTRAG EGOLI AND IGOLIDE

SCALE: 1:35,262	DRAWN BY: TS
DATE: 2023-06-22	REVIEWED BY: LN
FIGURE NO:	PROJECT NO: 41104282 REV:

IGOLIDE WEF

WEF COORDINATES



Label	X-Coordinate	Y-Coordinate
A	27° 30' 50.047" E	26° 26' 5.747" S
B	27° 31' 32.289" E	26° 26' 13.501" S
C	27° 31' 39.568" E	26° 26' 28.680" S
D	27° 32' 20.572" E	26° 26' 32.606" S
E	27° 32' 36.103" E	26° 26' 44.983" S
F	27° 32' 53.684" E	26° 26' 47.071" S
G	27° 32' 53.035" E	26° 26' 53.296" S
H	27° 32' 37.320" E	26° 26' 54.822" S
I	27° 32' 28.738" E	26° 26' 58.974" S
J	27° 32' 22.374" E	26° 26' 52.723" S
K	27° 31' 14.239" E	26° 27' 10.363" S
L	27° 31' 21.840" E	26° 27' 35.790" S
M	27° 31' 4.426" E	26° 27' 45.540" S
N	27° 30' 25.098" E	26° 27' 40.909" S
O	27° 30' 7.192" E	26° 28' 3.540" S
P	27° 29' 45.366" E	26° 28' 9.938" S

Label	X-Coordinate	Y-Coordinate
Q	27° 29' 50.180" E	26° 27' 56.916" S
R	27° 29' 55.494" E	26° 27' 55.937" S
S	27° 30' 2.002" E	26° 27' 50.516" S
T	27° 30' 2.742" E	26° 27' 42.073" S
U	27° 30' 11.233" E	26° 27' 25.277" S
V	27° 30' 11.509" E	26° 27' 17.954" S
W	27° 30' 17.013" E	26° 27' 17.823" S
X	27° 30' 15.705" E	26° 27' 9.177" S
Y	27° 29' 57.988" E	26° 27' 10.816" S
Z	27° 30' 2.347" E	26° 26' 53.984" S
AA	27° 30' 11.655" E	26° 26' 51.948" S
BB	27° 30' 26.639" E	26° 26' 55.606" S
CC	27° 30' 54.493" E	26° 26' 52.767" S
DD	27° 30' 44.013" E	26° 26' 25.541" S
EE	27° 30' 56.019" E	26° 26' 22.193" S

Legend

- Coordinates
- Turbines
- Roads
- Batching Plant
- Construction Camp
- Laydown Area
- IPP Substation
- IPP Substation buffer (500m)
- WEF Project Area

N

0 210 420 630 840

Metres

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PROJECTION:

PROJECT TITLE:

ENERTRAG EGOLI AND IGOLIDE

SCALE:

DRAWN BY:

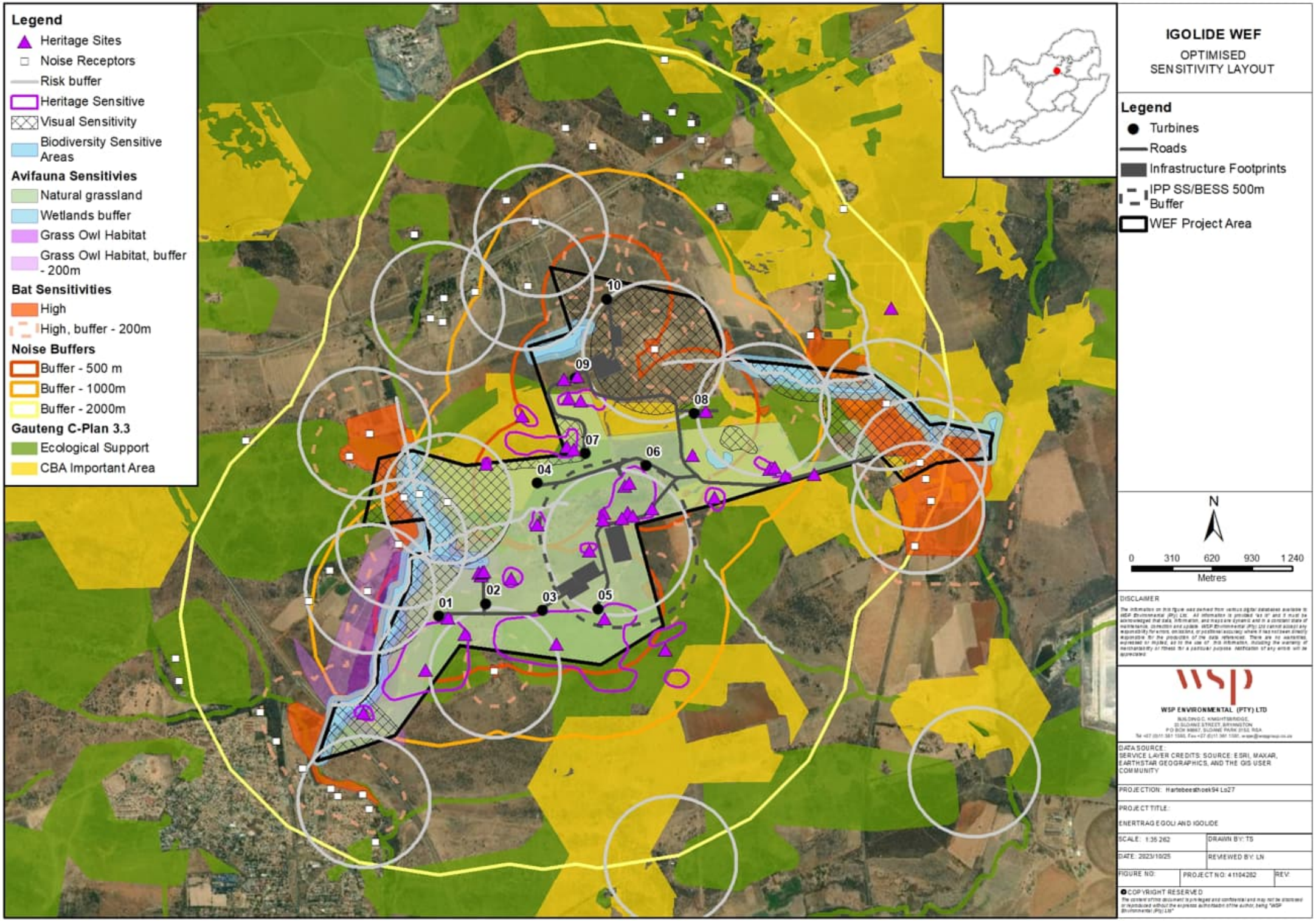
DATE:

REVIEWED BY:

FIGURE NO:

PROJECT NO:

REV:


Legend
Heritage Sites
Noise Receptors
Risk buffer
Heritage Sensitive
Visual Sensitivity
Biodiversity Sensitive Areas
Avifauna Sensitivies
Natural grassland
Wetlands buffer
Grass Owl Habitat
Grass Owl Habitat, buffer - 200m
Bat Sensitivities
High
High, buffer - 200m
Noise Buffers
Buffer - 500 m
Buffer - 1000m
Buffer - 2000m
Gauteng C-Plan 3.3
Ecological Support
CBA Important Area
01
02
03
04
05
06
07
08
09
10
IGOLIDE WEF
OPTIMISED SENSITIVITY LAYOUT
Legend
Turbines
Roads
Infrastructure Footprints
IPP SS/BESS 500m Buffer
WEF Project Area
N
0 310 620 930 1 240
Metres
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PROJECTION: Hartebeesthoek94 Lo27
PROJECT TITLE:
ENERTRAG EGOLI AND IGOLIDE
SCALE: 1:35 262
DRAWN BY: TS
DATE: 2023/10/25
REVIEWED BY: LN
FIGURE NO:
PROJECT NO: 41104282
REV:
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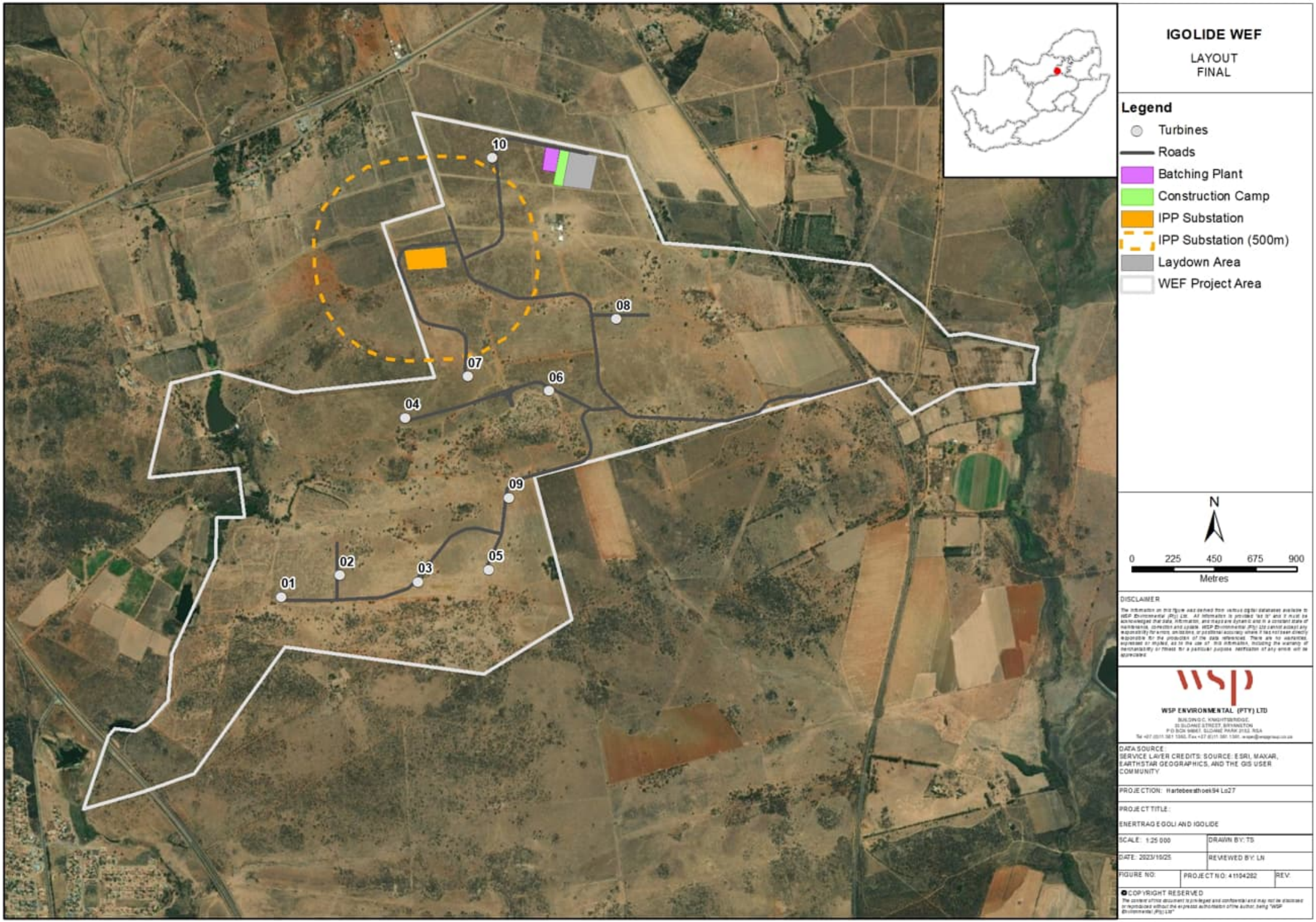

IGOLIDE WEF

LAYOUT
FINAL

Legend

- Turbines
- Roads
- Batching Plant
- Construction Camp
- IPP Substation
- IPP Substation (500m)
- Laydown Area
- WEF Project Area

N

0 225 450 675 900

Metres

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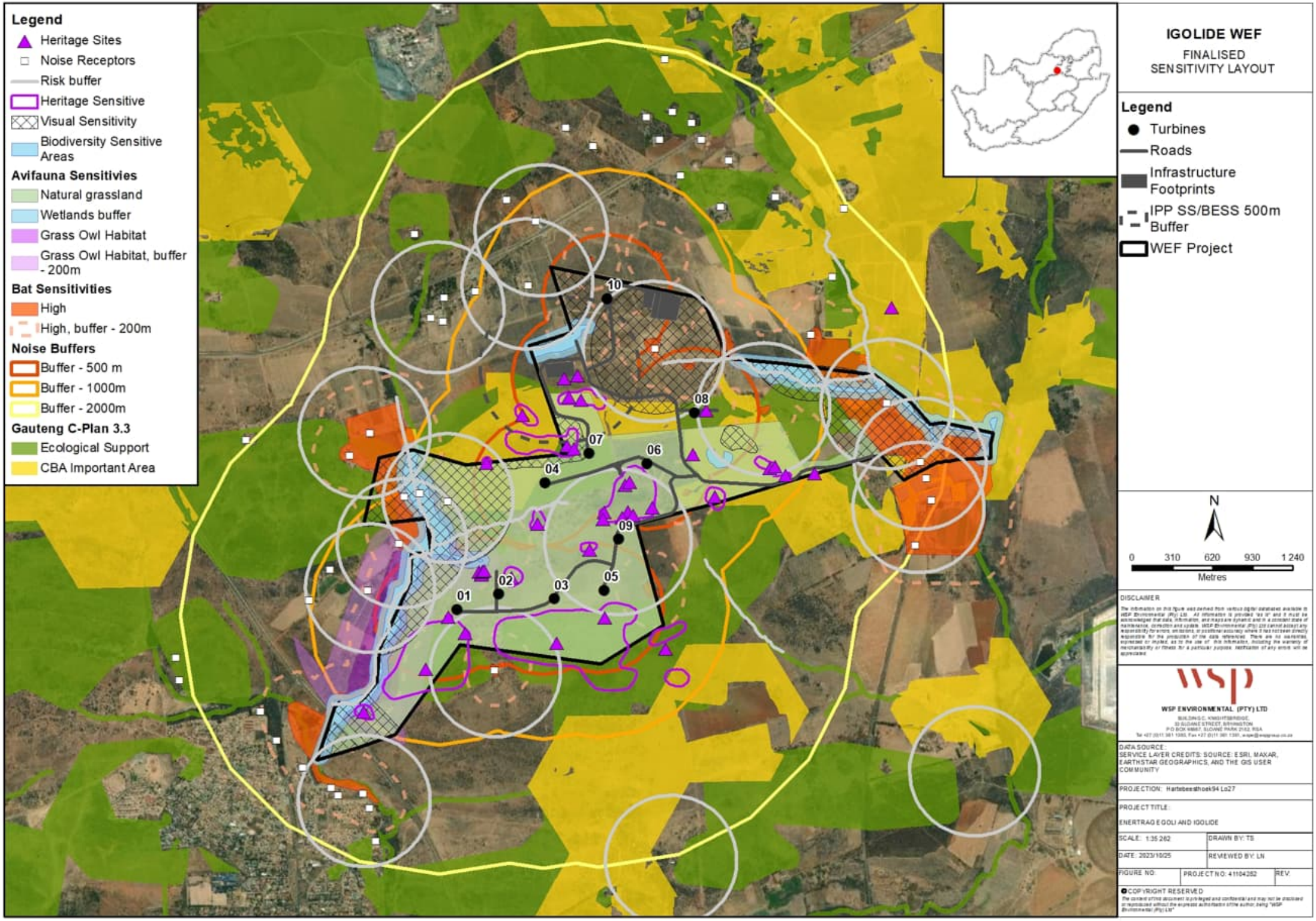
PROJECTION: Hartebeesthoek94 Lo27

PROJECT TITLE:

ENERTRAG EGOLI AND IGOLIDE

SCALE: 1:25 000	DRAWN BY: TS
DATE: 2023/10/25	REVIEWED BY: LN
FIGURE NO:	PROJECT NO: 41104282 REV:



IGOLIDE WEF

FINALISED
SENSITIVITY LAYOUT

Legend

- Turbines
- Roads
- Infrastructure Footprints
- IPP SS/BESS 500m Buffer
- WEF Project

N

0 310 620 930 1 240
Metres

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DATA SOURCE:
SERVICE LAYER CREDITS: SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY

PROJECTION: Hartebeesthoek94 Lo27

PROJECT TITLE:

ENERTRAG EGOLI AND IGOLIDE

SCALE: 1:35 262	DRAWN BY: TS
DATE: 2023/10/25	REVIEWED BY: LN
FIGURE NO:	PROJECT NO: 41104282 REV:

Appendix D

SUBSTATION GENERIC EMPR

GENERIC ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) FOR THE DEVELOPMENT AND EXPANSION OF SUBSTATION INFRASTRUCTURE FOR THE TRANSMISSION AND DISTRIBUTION OF ELECTRICITY

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

TABLE OF CONTENTS

List of tables

List of figures

INTRODUCTION

1. Background

The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) requires that an environmental management programme (EMPr) be submitted where an environmental impact assessment (EIA) has been identified as the environmental instrument to be utilised as the basis for a decision on an application for environmental authorisation (EA). The content of an EMPr must either contain the information set out in Appendix 4 of the Environmental Impact Assessment Regulations, 2014, as amended (EIA Regulations) or must be a generic EMPr relevant to an application as identified and gazetted by the Minister in a government notice. Once the Minister has identified, through a government notice that a generic EMPr is relevant to an application for EA, that generic EMPr must be applied by all parties involved in the EA process, including but not limited to the applicant and the competent authority (CA).

2. Purpose

This document constitutes a generic EMPr relevant to applications for the development or expansion of substation infrastructure for the transmission and distribution of electricity, and all listed and specified activities necessary for the realisation of such infrastructure.

3. Objective

The objective of this generic EMPr is to prescribe and pre-approve generally accepted impact management outcomes and impact management actions, which can commonly and repeatedly be used for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of substation infrastructure for the transmission and distribution of electricity. The use of a generic EMPr is intended to reduce the need to prepare and review individual EMPrs for applications of a similar nature.

4. Scope

The scope of this generic EMPr applies to the development or expansion of substation infrastructure for the transmission and distribution of electricity requiring EA in terms of NEMA. This generic EMPr applies to activities requiring EA, mainly activity 11 and 47 of the Environmental Impact Assessment Regulations Listing Notice 1 of 2014, as amended, and activity 9 of the Environmental Impact Assessment Regulations Listing Notice 2 of 2014, as amended, and all associated listed or specified activities necessary for the realization of such infrastructure.

5. Structure of this document

This document is structured in three parts with an Appendix as indicated in the table below:

Part	Section	Heading	Content
A		Provides general guidance and information and is **not legally binding**	Definitions, acronyms, roles & responsibilities and documentation and reporting.
B	1	Pre-approved generic	Contains generally accepted impact

Part	Section	Heading	Content
		EMPr template	management outcomes and impact management actions required for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of substation infrastructure for the transmission and distribution of electricity, which are presented in the form of a template that has been pre-approved. The template in this section is to be completed by the contractor, with each completed page signed and dated by the holder of the EA prior to commencement of the activity. Where an impact management outcome is not relevant, the words "not applicable" can be inserted in the template under the "responsible persons" column. Once completed and signed, the template represents the EMPr for the activity approved by the CA and is legally binding. The template **is not required** to be submitted to the CA as once the generic EMPr is gazetted for implementation, it has been approved by the CA. To allow interested and affected parties access to the pre-approved EMPr template for consideration through the decision-making process, the EAP on behalf of the applicant /proponent must make the hard copy of this EMPr available at a public location and where the applicant has a website, the EMPr should also be made available on such publicly accessible website.
	2	Site specific information	Contains preliminary infrastructure layout and a declaration that the applicant/holder of the EA will comply with the pre-approved generic EMPr template contained in Part B: Section 1, and understands that the impact management outcomes and impact management actions are **legally binding**. The preliminary infrastructure layout must be finalized to inform the final EMPr that is to be submitted with the basic assessment report (BAR) or environmental impact assessment report (EIAR), ensuring that all impact management outcomes and impact

Part	Section	Heading	Content
			management actions have been either pre-approved or approved in terms of Part C. This section **must be** submitted to the CA together with the final BAR or EIAR. The information submitted to the CA will be considered to be incomplete should a signed copy of Part B: section 2 not be submitted. Once approved, this Section forms part of the EMPr for the development and is legally binding.
C		Site specific sensitivities/ attributes	If any specific environmental sensitivities/ attributes are present on the site which require site specific impact management outcomes and impact management actions, not included in the pre-approved generic EMPr, to manage impacts, these specific impact management outcomes and impact management actions must be included in this section. These specific environmental attributes must be referenced spatially and impact management outcomes and impact management actions must be provided. These specific impact management outcomes and impact management actions must be presented in the format of the pre-approved EMPr template (Part B: section 1) This section will not be required should the site contain no specific environmental sensitivities or attributes. However, if Part C is applicable to the site, it **is required** to be submitted together with the BAR or EIAR, for consideration of, and decision on, the application for EA. The information in this section must be prepared by an EAP and must contain his/her name and expertise including a curriculum vitae. Once approved, Part C forms part of the EMPr for the site and is legally binding. This section applies only **to additional** impact management outcomes and impact management actions that are necessary for the avoidance, management and mitigation of impacts and risks associated with the specific development or expansion and which are not already included in Part B: section 1.
Appendix 1			Contains the method statements to be prepared prior to commencement of the activity. The method statements are **not**

Part	Section	Heading	Content
			required to be submitted to the competent authority.

6. Completion of part B: section 1: the pre-approved generic EMPr template

The template is to be completed prior to commencement of the activity, by providing the following information for each environmental impact management action:

- For implementation
  - a 'responsible person',
  - a method for implementation,
  - a timeframe for implementation
- For monitoring
  - a responsible person
  - frequency
  - evidence of compliance.

The completed template must be signed and dated by the holder of the EA prior to commencement of the activity. The method statements prepared and agreed to by the holder of the EA must be appended to the template as Appendix 1. Each method statement must be signed and dated on each page by the holder of the EA. This template once signed and dated is legally binding. The holder of the EA will remain responsible for its implementation.

7. Amendments of the impact management outcomes and impact management actions

Once the activity has commenced, a holder of an EA may make amendments to the impact management outcomes and impact management actions in the following manner:

- Amendment of the impact management outcomes: in line with the process contemplated in Regulation 37 of the EIA Regulations; and
- Amendment of the impact management actions: in line with the process contemplated in Regulation 36 of the EIA Regulations.

8. Documents to be submitted as part of part B: section 2 site specific information and declaration

Part B: Section 2 has three distinct sub-sections. The first and third sub-sections are in a template format. Sub-section two requires a map to be produced.

Sub-section 1 contains the project name, the applicant's name and contact details, the site information, which includes coordinates of the property or farm in which the proposed substation infrastructure is proposed as well as the 21-digit Surveyor General code of each cadastral land parcel and, where available, the farm name.

Sub-section 2 is to be prepared by an EAP and must contain his/her name and expertise including a curriculum vitae. This sub-section must include a map of the site sensitivity overlaid with the preliminary infrastructure layout using the national web based environmental screening tool, when available for compulsory use at: https://screening.environment.gov.za/screeningtool. The sensitivity map shall identify the nature of each sensitive feature e.g. threatened plant species, archaeological site, etc.

Sensitivity maps shall identify features both within the planned working area and any known sensitive features and within 50 m from the development footprint.

Sub-section 3 is the declaration that the applicant (s)/proponent (s) or holder of the EA in the case of a change of ownership must complete which confirms that the applicant/EA holder will comply with the pre-approved 'generic EMPr' template in Section 1 and understands that the impact management outcomes and impact management actions are legally binding.

(a) Amendments to Part B: Section 2 – site specific information and declaration

Should the EA be transferred, Part B: Section 2 must be completed by the new applicant/proponent and submitted with the application for an amendment of the EA in terms of regulations 29 or 31 of the EIA Regulations, whichever applies. The information submitted as part of such an application for an amendment to an EA will be considered to be incomplete should a signed copy of Part B: Section 2 not be submitted. Once approved, Part B: Section 2 forms part of the EMPr for the development and the EMPr becomes legally binding to the new EA holder.

PART A – GENERAL INFORMATION

1. DEFINITIONS

In this EMPr any word or expression to which a meaning has been assigned in the NEMA or EIA Regulations has that meaning, and unless the context requires otherwise –

"clearing" means the clearing and removal of vegetation, whether partially or in whole, including trees and shrubs, as specified;

"construction camp" is the area designated for key construction infrastructure and services, including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management;

"contractor" – The Contractor has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract, are in line with the Environmental Management Programme and that Method Statements are implemented as described.

"**hazardous substance**" is a substance governed by the Hazardous Substances Act, 1973 (Act No. 15 of 1973) as well as the Hazardous Chemical and Substances Regulations, 1995;

"method statement" means a written submission by the Contractor to the Project Manager in response to this EMPr or a request by the Project Manager and ECO. The method statement must set out the equipment, materials, labour and method(s) the Contractor proposes using to carry out an activity identified by the Project Manager when requesting the Method Statement. This must be done in such detail that the Project Manager and ECO is able to assess whether the Contractor's proposal is in accordance with this specification and/or will produce results in accordance with this specification;

The method statement must cover as a minimum applicable details with regard to:

(i) Construction procedures;
(ii) Plant, materials and equipment to be used;
(iii) Transporting the equipment to and from site;
(iv) How the plant/ material/ equipment will be moved while on site;
(v) How and where the plant/ material/ equipment will be stored;
(vi) The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
(vii) Timing and location of activities;
(viii) Compliance/ non-compliance; and
(ix) Any other information deemed necessary by the Project Manager.

"slope" means the inclination of a surface expressed as one unit of rise or fall for so many horizontal units;

"solid waste" means all solid waste, including construction debris, hazardous waste, excess cement/ concrete, wrapping materials, timber, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers);

"spoil" means excavated material which is unsuitable for use as material in the construction works or is material which is surplus to the requirements of the construction works;

"topsoil" means a varying depth (up to 300 mm) of the soil profile irrespective of the fertility, appearance, structure, agricultural potential, fertility and composition of the soil;

"works" means the works to be executed in terms of the Contract

2. ACRONYMS and ABBREVIATIONS

CA	Competent Authority
cEO	Contractors Environmental Officer
dEO	Developer Environmental Officer
DPM	Developer Project Manager
DSS	Developer Site Supervisor
EAR	Environmental Audit Report
ECA	Environmental Conservation Act No. 73 of 1989
ECO	Environmental Control Officer
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
ERAP	Emergency Response Action Plan
EMPr	Environmental Management Programme Report
EAP	Environmental Assessment Practitioner
FPA	Fire Protection Agency
HCS	Hazardous chemical Substance
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act ,2004 (Act No. 10 of 2004)
NEMWA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
MSDS	Material Safety Data Sheet
RI&AP's	Registered Interested and affected parties

3. ROLES AND RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) IMPLEMENTATION

The effective implementation of this generic EMPr is dependent on established and clear roles, responsibilities and reporting lines within an institutional framework. This section of the EMPr gives guidance to the various environmental roles and reporting lines, however, project specific requirements will ultimately determine the need for the appointment of specific person(s) to undertake specific roles and or responsibilities. As such, it must be noted that in the event that no specific person, for example, an environmental control officer (ECO) is appointed, the holder of the EA remains responsible for ensuring that the duties indicated in this document for action by the ECO are undertaken.

Table 1: *Guide to roles and responsibilities for implementation of an EMPr*

Responsible Person(s)	**Role and Responsibilities**
Developer's Project Manager (DPM)	Role The Project Developer is accountable for ensuring compliance with the EMPr and any conditions of approval from the competent authority (CA). Where required, an environmental control officer (ECO) must be contracted by the Project Developer to objectively monitor the implementation of the EMPr according to relevant environmental legislation, and the conditions of the environmental authorisation (EA). The Project Developer is further responsible for providing and giving mandate to enable the ECO to perform responsibilities, and he must ensure that the ECO is integrated as part of the project team while remaining independent. Responsibilities - Be fully conversant with the conditions of the EA; - Ensure that all stipulations within the EMPr are communicated and adhered to by the Developer and its Contractor(s); - Issuing of site instructions to the Contractor for corrective actions required; - Monitor the implementation of the EMPr throughout the project by means of site inspections and meetings. Overall management of the project and EMPr implementation; and - Ensure that periodic environmental performance audits are undertaken on the project implementation.
Developer Site Supervisor (DSS)	Role The DSS reports directly to the DPM, oversees site works, liaises with the contractor(s) and the ECO. The DSS is responsible for the day to day implementation of the EMPr and for ensuring the compliance of all contractors with the conditions and requirements stipulated in the EMPr.

Responsible Person(s)	Role and Responsibilities
	Responsibilities - Ensure that all contractors identify a contractor's Environmental Officer (cEO); - Must be fully conversant with the conditions of the EA. Oversees site works, liaison with Contractor, DPM and ECO; - Must ensure that all landowners have the relevant contact details of the site staff, ECO and cEO; - Issuing of site instructions to the Contractor for corrective actions required; - Will issue all non-compliances to contractors; and - Ratify the Monthly Environmental Report.
Environmental Control Officer (ECO)	Role The ECO should have appropriate training and experience in the implementation of environmental management specifications. The primary role of the ECO is to act as an independent quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts. In this respect, the ECO is to conduct periodic site inspections, attend regular site meetings, pre-empt problems and suggest mitigation and be available to advise on incidental issues that arise. The ECO is also required to conduct compliance audits, verifying the monitoring reports submitted by the cEO. The ECO provides feedback to the DSS and Project Manager regarding all environmental matters. The Contractor, cEO and dEO are answerable to the Environmental Control Officer for non-compliance with the Performance Specifications as set out in the EA and EMPr. The ECO provides feedback to the DSS and Project Manager, who in turn reports back to the Contractor and potential and Registered Interested &Affected Parties' (RI&AP's), as required. Issues of non-compliance raised by the ECO must be taken up by the Project Manager, and resolved with the Contractor as per the conditions of his contract. Decisions regarding environmental procedures, specifications and requirements which have a cost implication (i.e. those that are deemed to be a variation, not allowed for in the Performance Specification) must be endorsed by the Project Manager. The ECO must also, as specified by the EA, report to the relevant CA as and when required. Responsibilities The responsibilities of the ECO will include the following: - Be aware of the findings and conclusions of all EA related to the development;

Responsible Person(s)	Role and Responsibilities
	- Be familiar with the recommendations and mitigation measures of this EMPr; - Be conversant with relevant environmental legislation, policies and procedures, and ensure compliance with them; - Undertake regular and comprehensive site inspections / audits of the construction site according to the generic EMPr and applicable licenses in order to monitor compliance as required; - Educate the construction team about the management measures contained in the EMPr and environmental licenses; - Compilation and administration of an environmental monitoring plan to ensure that the environmental management measures are implemented and are effective; - Monitoring the performance of the Contractors and ensuring compliance with the EMPr and associated Method Statements; - In consultation with the Developer Site Supervisor order the removal of person(s) and/or equipment which are in contravention of the specifications of the EMPr and/or environmental licenses; - Liaison between the DPM, Contractors, authorities and other lead stakeholders on all environmental concerns; - Compile a regular environmental audit report highlighting any non-compliance issues as well as satisfactory or exceptional compliance with the EMPr; - Validating the regular site inspection reports, which are to be prepared by the contractor Environmental Officer (cEO); - Checking the cEO's record of environmental incidents (spills, impacts, legal transgressions etc.) as well as corrective and preventive actions taken; - Checking the cEO's public complaints register in which all complaints are recorded, as well as action taken; - Assisting in the resolution of conflicts; - Facilitate training for all personnel on the site – this may range from carrying out the training, to reviewing the training programmes of the Contractor; - In case of non-compliances, the ECO must first communicate this to the Senior Site Supervisor, who has the power to ensure this matter is addressed. Should no action or insufficient action be taken, the ECO may report this matter to the authorities as non-compliance; - Maintenance, update and review of the EMPr; - Communication of all modifications to the EMPr to the relevant stakeholders.

Responsible Person(s)	Role and Responsibilities
Developer Environmental Officer (dEO)	Role The dEOs will report to the Project Manager and are responsible for implementation of the EMPr, environmental monitoring and reporting, providing environmental input to the Project Manager and Contractor's Manager, liaising with contractors and the landowners as well as a range of environmental coordination responsibilities. Responsibilities - Be fully conversant with the EMPr; - Be familiar with the recommendations and mitigation measures of this EMPr, and implement these measures; - Ensure that all stipulations within the EMPr are communicated and adhered to by the Employees, Contractor(s) ; - Confine the development site to the demarcated area; - Conduct environmental internal audits with regards to EMPr and authorisation compliance (on cEO); - Assist the contractors in addressing environmental challenges on site; - Assist in incident management: - Reporting environmental incidents to developer and ensuring that corrective action is taken, and lessons learnt shared; - Assist the contractor in investigating environmental incidents and compile investigation reports; - Follow-up on pre-warnings, defects, non-conformance reports; - Measure and communicate environmental performance to the Contractor; - Conduct environmental awareness training on site together with ECO and cEO; - Ensure that the necessary legal permits and / or licenses are in place and up to date; - Acting as Developer's Environmental Representative on site and work together with the ECO and contractor;
Contractor	Role The Contractor appoints the cEO and has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract are in line with the EMPr and that Method Statements are implemented as described. External contractors must ensure compliance with this EMPr while

Responsible Person(s)	Role and Responsibilities
	performing the onsite activities as per their contract with the Project Developer. The contractors are required, where specified, to provide Method Statements setting out in detail how the impact management actions contained in the EMPr will be implemented during the development or expansion of substation infrastructure for the transmission and distribution of electricity activities. Responsibilities - project delivery and quality control for the development services as per appointment; - employ a suitably qualified person to monitor and report to the Project Developer's appointed person on the daily activities on-site during the construction period; - ensure that safe, environmentally acceptable working methods and practices are implemented and that equipment is properly operated and maintained, to facilitate proper access and enable any operation to be carried out safely; - attend on site meeting(s) prior to the commencement of activities to confirm the procedure and designated activity zones; - ensure that contractors' staff repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in EMPr, to the satisfaction of the ECO.
Contractor Environmental Officer (cEO)	Role Each Contractor affected by the EMPr should appoint a cEO, who is responsible for the on-site implementation of the EMPr (or relevant sections of the EMPr). The Contractor's representative can be the site agent; site engineer; a dedicated environmental officer; or an independent consultant. The Contractor must ensure that the Contractor's Representative is suitably qualified to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other site Contractors, labourers, the Environmental Control Officer and the public. As a minimum the cEO shall meet the following criteria: Responsibilities - Be on site throughout the duration of the project and be dedicated to the project; - Ensure all their staff are aware of the environmental requirements, conditions and constraints with respect to all of their activities on site; - Implementing the environmental conditions, guidelines and requirements as stipulated within the EA, EMPr and Method Statements; - Attend the Environmental Site Meeting;

Responsible Person(s)	Role and Responsibilities
	- Undertaking corrective actions where non-compliances are registered within the stipulated timeframes; - Report back formally on the completion of corrective actions; - Assist the ECO in maintaining all the site documentation; - Prepare the site inspection reports and corrective action reports for submission to the ECO; - Assist the ECO with the preparing of the monthly report; and - Where more than one Contractor is undertaking work on site, each company appointed as a Contractor will appoint a cEO representing that company.

4. ENVIRONMENTAL DOCUMENTATION REPORTING AND COMPLIANCE

To ensure accountable and demonstrated implementation of the EMPr, a number of reporting systems, documentation controls and compliance mechanisms must be in place for all substation infrastructure projects as a minimum requirement.

4.1 Document control/Filing system

The holder of the EA is solely responsible for the upkeep and management of the EMPr file. As a minimum, all documentation detailed below will be stored in the EMPr file. A hard copy of all documentation shall be filed, while an electronic copy may be kept where relevant. A duplicate file will be maintained in the office of the DSS (where applicable). This duplicate file must remain current and up-to-date. The filing system must be updated and relevant documents added as required. The EMPr file must be made available at all times on request by the CA or other relevant authorities. The EMPr file will form part of any environmental audits undertaken as prescribed in the EIA Regulations.

4.2 Documentation to be available

At the outset of the project the following preliminary list of documents shall be placed in the filing system and be accessible at all times:

- Full copy of the signed EA from the CA in terms of NEMA, granting approval for the development or expansion;
- Copy of the generic and site specific EMPr as well as any amendments thereof;
- Copy of declaration of implementing generic EMPr and subsequent approval of site specific EMPr and amendments thereof;
- All method statements;
- Completed environmental checklists;
- Minutes and attendance register of environmental site meetings;
- An up-to-date environmental incident log;
- A copy of all instructions or directives issued;
- A copy of all corrective actions signed off. The corrective actions must be filed in such a way that a clear reference is made to the non-compliance record;
- Complaints register.

4.3 Weekly Environmental Checklist

The ECOs are required to complete a Weekly Environmental Checklist, the format of which is to be agreed prior to commencement of the activity. The ECOs are required to sign and date the checklist, retain a copy in the EMPr file and submit a copy of the completed checklist to the DSS on a weekly basis.

The checklists will form the basis for the Monthly Environmental Reports. Copies of all completed checklists will be attached as Annexures to the Environmental Audit Report as required in terms of the EIA Regulations.

4.4 Environmental site meetings

Minutes of the environmental site meetings shall be kept. The minutes must include an attendance register and will be attached to the Monthly Report that is distributed to

attendees. Each set of minutes must clearly record "Matters for Attention" that will be reviewed at the next meeting.

4.5 Required Method Statements

The method statement will be done in such detail that the ECOs are enabled to assess whether the contractor's proposal is in accordance with the EMPr.

The method statement must cover applicable details with regard to:

- development procedures;
- materials and equipment to be used;
- getting the equipment to and from site;
- how the equipment/ material will be moved while on site;
- how and where material will be stored;
- the containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- timing and location of activities;
- compliance/ non-compliance with the EMPr; and
- any other information deemed necessary by the ECOs.

Unless indicated otherwise by the Project Manager, the Contractor shall provide the following method statements to the Project Manager no less than 14 days prior to the commencement date of the activity:

- Site establishment – Camps, Lay-down or storage areas, satellite camps, infrastructure;
- Batch plants;
- Workshop or plant servicing;
- Handling, transport and storage of Hazardous Chemical Substance's;
- Vegetation management – Protected, clearing, aliens, felling;
- Access management – Roads, gates, crossings etc.;
- Fire plan;
- Waste management – transport, storage, segregation, classification, disposal (all waste streams);
- Social interaction – complaints management, compensation claims, access to properties etc.;
- Water – use (source, abstraction and disposal), access and all related information, crossings and mitigation;
- Emergency preparedness – Spills, training, other environmental emergencies;
- Dust and noise management methodologies;
- Fauna interaction and risk management – only if the risk was identified – wildlife interaction especially on game farms; and
- Heritage and palaeontology management.

The ECOs shall monitor and ensure that the contractors perform in accordance with these method statements. Completed and agreed method statements between the holder of the EA and the contractor shall be captured in Appendix 1.

4.6 Environmental Incident Log (Diary)

The ECOs are required to maintain an up-to-date and current Environmental Incident Log (environmental diary). The Environmental Incident Log is a means to record all environmental incidents and/or all non-compliance notice would not be issued. An environmental incident is defined as:

- Any deviation from the listed impact management actions (listed in this EMPr) that may be addressed immediately by the ECOs. (For example a contractor's staff member littering or a drip tray that has not been emptied);
- Any environmental impact resulting from an action or activity by a contractor in contravention of the environmental stipulations and guidelines listed in the EMPr which as a single event would have a minor impact but which if cumulative and continuous would have a significant effect (for example no toilet paper available in the ablutions for an afternoon); and
- General environmental information such as road kills or injured wildlife.

The ECOs are to record all environmental incidents in the Environmental Incident Log. All incidents regardless of severity must be reported to the Developer. The Log is to be kept in the EMPr file and at a minimum the following will be recorded for each environmental incident:

- The date and time of the incident;
- Description of the incident;
- The name of the Contractor responsible;
- The incident must be listed as significant or minor;
- If the incident is listed as significant, a non-compliance notice must be issued, and recorded in the log;
- Remedial or corrective action taken to mitigate the incident; and
- Record of repeat minor offences by the same contractor or staff member.

The Environmental Incident Log will be captured in the EAR.

4.7 Non-compliance

A non-compliance notice will be issued to the responsible contractor by the ECOs via the DSS or Project Manager. The non-compliance notice will be issued in writing; a copy filed in the EMPr file and will at a minimum include the following:

- Time and date of the non-compliance;
- Name of the contractor responsible;
- Nature and description of the non-compliance;
- Recommended / required corrective action; and
- Date by which the corrective action to be completed.
- The contractors shall act immediately when a notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the development site pertaining to the environment shall be recorded in a dedicated register and the response noted with the date and action taken. The ECO should be made aware of any complaints. Any non-compliance with the agreed procedures of the EMPr is a transgression of the various statutes and laws that define the manner by which the environment is managed. Failure to redress the cause shall be reported to the relevant CA for them to deal with the transgression, as it deems fit. The contractor is deemed not to have complied with the EMPr if, inter alia, There is a deviation from the environmental conditions, impact management outcomes and impact management actions activities, as approved in generic and site specific EMPr as relevant as set out in the EMPr, which deviation has, or may cause, an environmental impact.

4.8 Corrective action records

For each non-compliance notice issued, a documented corrective action must be recorded. On receiving a non-compliance notice from the DSS, the contractor's cEO will ensure that the corrective actions required take place within the stipulated timeframe. On completion of the corrective action the cEO is to issue a Corrective Action Report in writing to the ECOs. If satisfied that the corrective action has been completed, the ECOs are to sign-off on the Corrective Action Report, and attach the report to the non-compliance notice in the EMPr file. A corrective action is considered complete once the report has signed off by the ECOs.

4.9 Photographic record

A digital photographic record will be kept. The photographic record will be used to show before, during and post rehabilitation evidence of the project as well used in cases of damages claims if they arise. Each image must be dated and a brief description note attached.

The Contractor shall:

1. Allow the ECOs access to take photographs of all areas, activities and actions.

The ECOs shall keep an electronic database of photographic records which will include:

1. Pictures of all areas designated as work areas, camp areas, development sites and storage areas taken before these areas are set up;
2. All bunding and fencing;
3. Road conditions and road verges;
4. Condition of all farm fences;
5. Topsoil storage areas;
6. All areas to be cordoned off during construction;
7. Waste management sites;
8. Ablution facilities (inside and out);
9. Any non-conformances deemed to be "significant";
10. All completed corrective actions for non-compliances;
11. All required signage;
12. Photographic recordings of incidents;
13. All areas before, during and post rehabilitation; and
14. Include relevant photographs in the Final Environmental Audit Report.

4.10 Complaints register

The ECOs shall keep a current and up-to-date complaints register. The complaints register is to be a record of all complaints received from communities, stakeholders and individuals. The Complaints Record shall:

1. Record the name and contact details of the complainant;
2. Record the time and date of the complaint;
3. Contain a detailed description of the complaint;
4. Where relevant and appropriate, contain photographic evidence of the complaint or damage (ECOs to take relevant photographs); and
5. Contain a copy of the ECOs written response to each complaint received and keep a record of any further correspondence with the complainant. The ECO's written

response will include a description of any corrective action to be taken and must be signed by the Contractor, ECO and affected party. Where a damage claim is issued by the complainant, the ECOs shall respond as described in (**section 4.11**) below.

4.11 Claims for damages

In the event that a Claim for Damages is submitted by a community, landowner or individual, the ECOs shall:

1. Record the full detail of the complaint as described in (**section 4.10**) above;
2. The DPM will evaluate the claim and associated damage and submit the evaluation to the Senior Site Representative for approval;
3. Following consideration by the DPM, the claim is to be resolved and settled immediately, or the reason for not accepting the claim communicated in writing to the claimant. Should the claimant not accept this, the ECO shall, in writing report the incident to the Developer's negotiator and legal department; and
4. A formal record of the response by the ECOs to the claimant as well as the rectification of the method of making payments not amount will be recorded in the EMPr file.

4.12 Interactions with affected parties

Open, transparent and good relations with affected landowners, communities and regional staff are an essential aspect to the successful management and mitigation of environmental impacts.

The ECOs shall:

1. Ensure that all queries, complaints and claims are dealt within an agreed timeframe;
2. Ensure that any or all agreements are documented, signed by all parties and a record of the agreement kept in the EMPr file;
3. Ensure that a complaints telephone numbers are made available to all landowners and affected parties; and
4. Ensure that contact with affected parties is courteous at all times;

4.13 Environmental audits

Internal environmental audits of the activity and implementation of the EMPr must be undertaken. The findings and outcomes included in the EMPr file and submitted to the CA at intervals as indicated in the EA.

The ECOs must prepare a monthly EAR. The report will be tabled as the key point on the agenda of the Environmental Site Meeting. The Report is submitted for acceptance at the meeting and the final report will be circulated to the Project Manager and filed in the EMPr file. At a frequency determined by the EA, the ECOs shall submit the monthly reports to the CA. At a minimum the monthly report is to cover the following:

- Weekly Environmental Checklists;
- Deviations and non-compliances with the checklists;
- Non-compliances issued;
- Completed and reported corrective actions;
- Environmental Monitoring;

- General environmental findings and actions; and
- Minutes of the Bi-monthly Environmental Site Meetings.

4.14 Final environmental audits

On final completion of the rehabilitation and/or requirements of the EA a final EAR is to be prepared and submitted to the CA. The EAR must comply with Appendix 7 of the EIA Regulations.

PART B: SECTION 1: Pre-approved generic EMPr template

5. IMPACT MANAGEMENT OUTCOMES AND IMPACT MANAGEMENT ACTIONS

This section provides a pre-approved generic EMPr template with aspects that are common to the development of substation infrastructure for the transmission and distribution of electricity. There is a list of aspects identified for the development or expansion of substation infrastructure for the transmission and distribution of electricity, and for each aspect a set of prescribed impact management outcomes and associated impact management actions have been identified. Holders of Eas are responsible to ensure the implementation of these outcomes and actions for all projects as a minimum requirement, in order to mitigate the impact of such aspects identified for the development or expansion of substation infrastructure for the transmission and distribution of electricity.

The template provided below is to be completed by providing the information under each heading for each environmental impact management action.

The completed template must be signed and dated on each page by both the contractor and the holder of the EA prior to commencement of the activity. The method statements prepared and agreed to by the holder of the EA must be appended to the template as

Appendix 1. Each method statement must also be duly signed and dated on each page by the contactor and the holder of the EA. This template, once signed and dated, is legally binding. The holder of the EA will remain responsible for its implementation.

5.1 Environmental awareness training

Impact management outcome: All onsite staff are aware and understands the individual responsibilities in terms of this EMPr.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All staff must receive environmental awareness training prior to commencement of the activities; – The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course; – Refresher environmental awareness training is available as and when required; – All staff are aware of the conditions and controls linked to the EA and within the EMPr and made aware of their individual roles and responsibilities in achieving compliance with the EA and EMPr; – The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum: a) Safety notifications; and b) No littering. – Environmental awareness training must include as a minimum the following: a) Description of significant environmental impacts, actual or potential, related to their work activities; b) Mitigation measures to be implemented when carrying out specific activities; c) Emergency preparedness and response procedures; d) Emergency procedures; e) Procedures to be followed when working near or						

within sensitive areas; f) Wastewater management procedures; g) Water usage and conservation; h) Solid waste management procedures; i) Sanitation procedures; j) Fire prevention; and k) Disease prevention. – A record of all environmental awareness training courses undertaken as part of the EMPr must be available; – Educate workers on the dangers of open and/or unattended fires; – A staff attendance register of all staff to have received environmental awareness training must be available. – Course material must be available and presented in appropriate languages that all staff can understand.						

5.2 Site Establishment development

Impact management outcome: Impacts on the environment are minimised during site establishment and the development footprint are kept to demarcated development area.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– A method statement must be provided by the contractor prior to any onsite activity that includes the layout of the construction camp in the form of a plan showing the location of key infrastructure and services (where applicable), including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous materials storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access						

routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management; – Location of camps must be within approved area to ensure that the site does not impact on sensitive areas identified in the environmental assessment or site walk through; – Sites must be located where possible on previously disturbed areas; – The camp must be fenced in accordance with ***Section 5.5: Fencing and gate installation***; and – The use of existing accommodation for contractor staff, where possible, is encouraged.						

5.3 Access restricted areas

Impact management outcome: Access to restricted areas prevented.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Identification of access restricted areas is to be informed by the environmental assessment, site walk through and any additional areas identified during development; – Erect, demarcate and maintain a temporary barrier with clear signage around the perimeter of any access restricted area, colour coding could be used if appropriate; and – Unauthorised access and development related activity inside access restricted areas is prohibited.						

5.4 Access roads

Impact management outcome: Minimise impact to the environment through the planned and restricted movement of vehicles on site.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– An access agreement must be formalised and signed by the DPM, Contractor and landowner before commencing with the activities; – All private roads used for access to the servitude must be maintained and upon completion of the works, be left in at least the original condition – All contractors must be made aware of all these access routes. – Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the contractor's expense; – Maximum use of both existing servitudes and existing roads must be made to minimize further disturbance through the development of new roads; – In circumstances where private roads must be used, the condition of the said roads must be recorded in accordance with ***section 4.9: photographic record***; prior to use and the condition thereof agreed by the landowner, the DPM, and the contractor; – Access roads in flattish areas must follow fence lines and tree belts to avoid fragmentation of vegetated areas or croplands – Access roads must only be developed on a pre-planned and approved roads.						

5.5 Fencing and Gate installation

Impact management outcome: Minimise impact to the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Use existing gates provided to gain access to all parts of the area authorised for development, where possible; – Existing and new gates to be recorded and documented in accordance with **section *4.9: photographic record***; – All gates must be fitted with locks and be kept locked at all times during the development phase, unless otherwise agreed with the landowner; – At points where the line crosses a fence in which there is no suitable gate within the extent of the line servitude, on the instruction of the DPM, a gate must be installed at the approval of the landowner; – Care must be taken that the gates must be so erected that there is a gap of no more than 100 mm between the bottom of the gate and the ground; – Where gates are installed in jackal proof fencing, a suitable reinforced concrete sill must be provided beneath the gate; – Original tension must be maintained in the fence wires; – All gates installed in electrified fencing must be re-electrified; – All demarcation fencing and barriers must be maintained in good working order for the duration of the development activities; – Fencing must be erected around the camp, batching plants, hazardous storage areas, and all designated access restricted areas, where applicable; – Any temporary fencing to restrict the movement of life-stock must only be erected with the permission of the land owner.						

– All fencing must be developed of high quality material bearing the SABS mark; – The use of razor wire as fencing must be avoided; – Fenced areas with gate access must remain locked after hours, during weekends and on holidays if staff is away from site. Site security will be required at all times; – On completion of the development phase all temporary fences are to be removed; – The contractor must ensure that all fence uprights are appropriately removed, ensuring that no uprights are cut at ground level but rather removed completely.						

5.6 Water Supply Management

Impact management outcome: Undertake responsible water usage.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All abstraction points or bore holes must be registered with the DWS and suitable water meters installed to ensure that the abstracted volumes are measured on a daily basis; – The Contractor must ensure the following: a. The vehicle abstracting water from a river does not enter or cross it and does not operate from within the river; b. No damage occurs to the river bed or banks and that the abstraction of water does not entail stream diversion activities; and c. All reasonable measures to limit pollution or sedimentation of the downstream watercourse are implemented. – Ensure water conservation is being practiced by:						

a. Minimising water use during cleaning of equipment; b. Undertaking regular audits of water systems; and c. Including a discussion on water usage and conservation during environmental awareness training. d. The use of grey water is encouraged.						

5.7 Storm and waste water management

Impact management outcome: Impacts to the environment caused by storm water and wastewater discharges during construction are avoided.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Runoff from the cement/ concrete batching areas must be strictly controlled, and contaminated water must be collected, stored and either treated or disposed of off-site, at a location approved by the project manager; – All spillage of oil onto concrete surfaces must be controlled by the use of an approved absorbent material and the used absorbent material disposed of at an appropriate waste disposal facility; – Natural storm water runoff not contaminated during the development and clean water can be discharged directly to watercourses and water bodies, subject to the Project Manager's approval and support by the ECO; – Water that has been contaminated with suspended solids, such as soils and silt, may be released into watercourses or water bodies only once all suspended solids have been removed from the water by settling out these solids in settlement ponds. The release of settled water back into the environment must be subject to the Project Manager's approval and support by the ECO.						

5.8 Solid and hazardous waste management

Impact management outcome: Wastes are appropriately stored, handled and safely disposed of at a recognised waste facility.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All measures regarding waste management must be undertaken using an integrated waste management approach; – Sufficient, covered waste collection bins (scavenger and weatherproof) must be provided; – A suitably positioned and clearly demarcated waste collection site must be identified and provided; – The waste collection site must be maintained in a clean and orderly manner; – Waste must be segregated into separate bins and clearly marked for each waste type for recycling and safe disposal; – Staff must be trained in waste segregation; – Bins must be emptied regularly; – General waste produced onsite must be disposed of at registered waste disposal sites/ recycling company; – Hazardous waste must be disposed of at a registered waste disposal site; – Certificates of safe disposal for general, hazardous and recycled waste must be maintained.						

5.9 Protection of watercourses and estuaries

Impact management outcome: Pollution and contamination of the watercourse environment and or estuary erosion are prevented.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance

– All watercourses must be protected from direct or indirect spills of pollutants such as solid waste, sewage, cement, oils, fuels, chemicals, aggregate tailings, wash and contaminated water or organic material resulting from the Contractor's activities; – In the event of a spill, prompt action must be taken to clear the polluted or affected areas; – Where possible, no development equipment must traverse any seasonal or permanent wetland – No return flow into the estuaries must be allowed and no disturbance of the Estuarine functional Zone should occur; – Development of permanent watercourse or estuary crossing must only be undertaken where no alternative access to tower position is available; – There must not be any impact on the long term morphological dynamics of watercourses or estuaries; – Existing crossing points must be favored over the creation of new crossings (including temporary access) – When working in or near any watercourse or estuary, the following environmental controls and consideration must be taken: –Water levels during the period of construction; No altering of the bed, banks, course or characteristics of a watercourse b) During the execution of the works, appropriate measures to prevent pollution and contamination of the riparian environment must be implemented e.g. including ensuring that construction equipment is well maintained; c) Where earthwork is being undertaken in close proximity to any watercourse, slopes must be stabilised using suitable materials, i.e. sandbags or geotextile fabric, to prevent sand and rock from entering the channel; and d) Appropriate rehabilitation and re-vegetation measures for the watercourse banks must be implemented timeously.						

In this regard, the banks should be appropriately and incrementally stabilised as soon as development allows.						

5.10 Vegetation clearing

Impact management outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
General: – Indigenous vegetation which does not interfere with the development must be left undisturbed; – Protected or endangered species may occur on or near the development site. Special care should be taken not to damage such species; – Search, rescue and replanting of all protected and endangered species likely to be damaged during project development must be identified by the relevant specialist and completed prior to any development or clearing; – Permits for removal must be obtained from the relevant CA prior to the cutting or clearing of the affected species, and they must be filed; – The Environmental Audit Report must confirm that all identified species have been rescued and replanted and that the location of replanting is compliant with conditions of approvals; – Trees felled due to construction must be documented and form part of the Environmental Audit Report; – Rivers and watercourses must be kept clear of felled trees, vegetation cuttings and debris; – Only a registered pest control operator may apply herbicides on a commercial basis and commercial						

application must be carried out under the supervision of a registered pest control operator, supervision of a registered pest control operator or is appropriately trained; – A daily register must be kept of all relevant details of herbicide usage; – No herbicides must be used in estuaries; – All protected species and sensitive vegetation not removed must be clearly marked and such areas fenced off in accordance to ***Section 5.3: Access restricted areas***. Alien invasive vegetation must be removed and disposed of at a licensed waste management facility.						

5.11 Protection of fauna

Impact management outcome: Disturbance to fauna is minimised.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– No interference with livestock must occur without the landowner's written consent and with the landowner or a person representing the landowner being present; – The breeding sites of raptors and other wild birds species must be taken into consideration during the planning of the development programme; – Breeding sites must be kept intact and disturbance to breeding birds must be avoided. Special care must be taken where nestlings or fledglings are present; – Special recommendations of the avian specialist must be adhered to at all times to prevent unnecessary disturbance of birds; – No poaching must be tolerated under any circumstances. All animal dens in close proximity to the works areas must be						

marked as Access restricted areas; – No deliberate or intentional killing of fauna is allowed; – In areas where snakes are abundant, snake deterrents to be deployed on the pylons to prevent snakes climbing up, being electrocuted and causing power outages; and – No Threatened or Protected species (ToPs) and/or protected fauna as listed according NEMBA (Act No. 10 of 2004) and relevant provincial ordinances may be removed and/or relocated without appropriate authorisations/permits.						

5.12 Protection of heritage resources

Impact management outcome: Impact to heritage resources is minimised .						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Identify, demarcate and prevent impact to all known sensitive heritage features on site in accordance with the No-Go procedure in ***Section 5.3: Access restricted areas***; – Carry out general monitoring of excavations for potential fossils, artefacts and material of heritage importance; – All work must cease immediately, if any human remains and/or other archaeological, palaeontological and historical material are uncovered. Such material, if exposed, must be reported to the nearest museum, archaeologist/ palaeontologist (or the South African Police Services), so that a systematic and professional investigation can be undertaken. Sufficient time must be allowed to remove/collect such material before development recommences.						

5.13 Safety of the public

Impact management outcome: All precautions are taken to minimise the risk of injury, harm or complaints.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Identify fire hazards, demarcate and restrict public access to these areas as well as notify the local authority of any potential threats e.g. large brush stockpiles, fuels etc.; – All unattended open excavations must be adequately fenced or demarcated; – Adequate protective measures must be implemented to prevent unauthorised access to and climbing of partly constructed towers and protective scaffolding; – Ensure structures vulnerable to high winds are secured; – Maintain an incidents and complaints register in which all incidents or complaints involving the public are logged.						

5.14 Sanitation

Impact management outcome: Clean and well maintained toilet facilities are available to all staff in an effort to minimise the risk of disease and impact to the environment.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Mobile chemical toilets are installed onsite if no other ablution facilities are available; – The use of ablution facilities and or mobile toilets must be used at all times and no indiscriminate use of the veld for the purposes of ablutions must be permitted under any circumstances; – Where mobile chemical toilets are required, the following						

must be ensured: a) Toilets are located no closer than 100 m to any watercourse or water body; b) Toilets are secured to the ground to prevent them from toppling due to wind or any other cause; c) No spillage occurs when the toilets are cleaned or emptied and the contents are managed in accordance with the EMPr; d) Toilets have an external closing mechanism and are closed and secured from the outside when not in use to prevent toilet paper from being blown out; e) Toilets are emptied before long weekends and workers holidays, and must be locked after working hours; f) Toilets are serviced regularly and the ECO must inspect toilets to ensure compliance to health standards; – A copy of the waste disposal certificates must be maintained.						

5.15 Prevention of disease

Impact Management outcome: All necessary precautions linked to the spread of disease are taken.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Undertake environmentally-friendly pest control in the camp area; – Ensure that the workforce is sensitised to the effects of sexually transmitted diseases, especially HIV AIDS; – The Contractor must ensure that information posters on AIDS are displayed in the Contractor Camp area; – Information and education relating to sexually transmitted diseases to be made available to both construction workers						

and local community, where applicable; – Free condoms must be made available to all staff on site at central points; – Medical support must be made available; – Provide access to Voluntary HIV Testing and Counselling Services.						

5.16 Emergency procedures

Impact management outcome: Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Compile an Emergency Response Action Plan (ERAP) prior to the commencement of the proposed project; – The Emergency Plan must deal with accidents, potential spillages and fires in line with relevant legislation; – All staff must be made aware of emergency procedures as part of environmental awareness training; – The relevant local authority must be made aware of a fire as soon as it starts; – In the event of emergency necessary mitigation measures to contain the spill or leak must be implemented (see ***Hazardous Substances section 5.17***).						

5.17 Hazardous substances

Impact management outcome: Safe storage, handling, use and disposal of hazardous substances.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of

	person	implementation	implementation	person		compliance
– The use and storage of hazardous substances to be minimised and non-hazardous and non-toxic alternatives substituted where possible; – All hazardous substances must be stored in suitable containers as defined in the Method Statement; – Containers must be clearly marked to indicate contents, quantities and safety requirements; – All storage areas must be bunded. The bunded area must be of sufficient capacity to contain a spill / leak from the stored containers; – Bunded areas to be suitably lined with a SABS approved liner; – An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and kept up to date on a continuous basis; – All hazardous chemicals that will be used on site must have Material Safety Data Sheets (MSDS); – All employees working with HCS must be trained in the safe use of the substance and according to the safety data sheet; – Employees handling hazardous substances / materials must be aware of the potential impacts and follow appropriate safety measures. Appropriate personal protective equipment must be made available; – The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowsers; – The tanks/ bowsers must be situated on a smooth impermeable surface (concrete) with a permanent bund. The impermeable lining must extend to the crest of the bund and the volume inside the bund must be 130% of the total capacity of all the storage tanks/ bowsers (110% statutory						

requirement plus an allowance for rainfall); – The floor of the bund must be sloped, draining to an oil separator; – Provision must be made for refueling at the storage area by protecting the soil with an impermeable groundcover. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained; – All empty externally dirty drums must be stored on a drip tray or within a bunded area; – No unauthorised access into the hazardous substances storage areas must be permitted; – No smoking must be allowed within the vicinity of the hazardous storage areas; – Adequate fire-fighting equipment must be made available at all hazardous storage areas; – Where refueling away from the dedicated refueling station is required, a mobile refueling unit must be used. Appropriate ground protection such as drip trays must be used; – An appropriately sized spill kit kept onsite relevant to the scale of the activity/s involving the use of hazardous substance must be available at all times; – The responsible operator must have the required training to make use of the spill kit in emergency situations; – An appropriate number of spill kits must be available and must be located in all areas where activities are being undertaken; – In the event of a spill, contaminated soil must be collected in containers and stored in a central location and disposed of according to the National Environmental Management: Waste Act 59 of 2008. Refer to ***Section 5.7*** for procedures concerning ***storm and waste water management*** and ***5.8*** for ***solid and hazardous waste management.***						

5.18 Workshop, equipment maintenance and storage

Impact management outcome: Soil, surface water and groundwater contamination is minimised.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Where possible and practical all maintenance of vehicles and equipment must take place in the workshop area; – During servicing of vehicles or equipment, especially where emergency repairs are effected outside the workshop area, a suitable drip tray must be used to prevent spills onto the soil. The relevant local authority must be made aware of a fire as soon as it starts; – Leaking equipment must be repaired immediately or be removed from site to facilitate repair; – Workshop areas must be monitored for oil and fuel spills; – Appropriately sized spill kit kept onsite relevant to the scale of the activity taking place must be available; – The workshop area must have a bunded concrete slab that is sloped to facilitate runoff into a collection sump or suitable oil / water separator where maintenance work on vehicles and equipment can be performed; – Water drainage from the workshop must be contained and managed in accordance Section ***5.7: Storm and waste water management***.						

5.19 Batching plants

Impact management outcome: Minimise spillages and contamination of soil, surface water and groundwater.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance

– Concrete mixing must be carried out on an impermeable surface; – Batching plants areas must be fitted with a containment facility for the collection of cement laden water. – Dirty water from the batching plant must be contained to prevent soil and groundwater contamination – Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains; – A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted; – Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licenced disposal facility; – Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site; – Sand and aggregates containing cement must be kept damp to prevent the generation of dust (Refer to ***Section 5.20: Dust emissions***) – Any excess sand, stone and cement must be removed or reused from site on completion of construction period and disposed at a registered disposal facility; – Temporary fencing must be erected around batching plants in accordance with Section ***5.5: Fencing and gate installation***.						

5.20 Dust emissions

Impact management outcome: Dust prevention measures are applied to minimise the generation of dust.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of

	person	implementation	implementation	person		compliance
– Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO; – Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces must be re- vegetated or stabilised as soon as is practically possible; – Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present; – During high wind conditions, the ECO must evaluate the situation and make recommendations as to whether dust-damping measures are adequate, or whether working will cease altogether until the wind speed drops to an acceptable level; – Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind; – Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO; – Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas; – Straw stabilisation must be applied at a rate of one bale/10 m² and harrowed into the top 100 mm of top material, for all completed earthworks; – For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread of dust.						

5.21 Blasting

Impact management outcome: Impact to the environment is minimised through a safe blasting practice.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Any blasting activity must be conducted by a suitably licensed blasting contractor; and – Notification of surrounding landowners, emergency services site personnel of blasting activity 24 hours prior to such activity taking place on Site.						

5.22 Noise

Impact Management outcome: Prevent unnecessary noise to the environment by ensuring that noise from development activity is mitigated.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– The Contractor must keep noise level within acceptable limits, Restrict the use of sound amplification equipment for communication and emergency only; – All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained; – Any complaints received by the Contractor regarding noise must be recorded and communicated. Where possible or applicable, provide transport to and from the site on a daily basis for construction workers; – Develop a Code of Conduct for the construction phase in terms of behaviour of construction staff. Operating hours as determined by the environmental authorisation are adhered to during the development phase. Where not defined, it must be ensured that development activities must still meet						

the impact management outcome related to noise management.						

5.23 Fire prevention

Impact management outcome: Prevention of uncontrollable fires.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Designate smoking areas where the fire hazard could be regarded as insignificant; – Firefighting equipment must be available on all vehicles located on site; – The local Fire Protection Agency (FPA) must be informed of construction activities; – Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site; – Two way swop of contact details between ECO and FPA.						

5.24 Stockpiling and stockpile areas

Impact management outcome: Reduce erosion and sedimentation as a result of stockpiling.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All material that is excavated during the project development phase (either during piling (if required) or earthworks) must be stored appropriately on site in order to minimise impacts to watercourses, watercourses and water bodies;						

– All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods; – Topsoil stockpiles must not exceed 2 m in height; – During periods of strong winds and heavy rain, the stockpiles must be covered with appropriate material (e.g. cloth, tarpaulin etc.); – Where possible, sandbags (or similar) must be placed at the bases of the stockpiled material in order to prevent erosion of the material.						

5.25 Civil works

Impact management outcome: Impact to the environment minimised during civil works to create the substation terrace.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Where terracing is required, topsoil must be collected and retained for the purpose of re-use later to rehabilitate disturbed areas not covered by yard stone; – Areas to be rehabilitated include terrace embankments and areas outside the high voltage yards; – Where required, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled; – These areas can be stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly; – Rehabilitation of the disturbed areas must be managed in accordance with ***Section 5.35: Landscaping and rehabilitation***; – All excess spoil generated during terracing activities must be						

disposed of in an appropriate manner and at a recognised landfill site; and – Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes.						

5.26 Excavation of foundation, cable trenching and drainage systems

Impact management outcome: No environmental degradation occurs as a result of excavation of foundation, cable trenching and drainage systems.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All excess spoil generated during foundation excavation must be disposed of in an appropriate manner and at a licensed landfill site, if not used for backfilling purposes; – Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes; – Management of equipment for excavation purposes must be undertaken in accordance with ***Section 5.18: Workshop, equipment maintenance and storage***; and – Hazardous substances spills from equipment must be managed in accordance with ***Section 5.17: Hazardous substances***.						

5.27 Installation of foundations, cable trenching and drainage systems

Impact management outcome: No environmental degradation occurs during the installation of foundation, cable trenching and drainage system.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance

– Batching of cement to be undertaken in accordance with **Section *5.19: Batching plants***; and – Residual solid waste must be disposed of in accordance with **Section *5.8: Solid waste and hazardous management***.						

5.28 Installation of equipment (circuit breakers, current Transformers, Isolators, Insulators, surge arresters, voltage transformers, earth switches)

Impact management outcome: No environmental degradation occurs as a result of installation of equipment.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Management of dust must be conducted in accordance with Section ***5. 20: Dust emissions***; – Management of equipment used for installation must be conducted in accordance with Section ***5.18: Workshop, equipment maintenance and storage***; – Management hazardous substances and any associated spills must be conducted in accordance with Section ***5.17: Hazardous substances***; and – Residual solid waste must be recycled or disposed of in accordance with ***Section 5.8: Solid waste and hazardous management***.						

5.29 Steelwork Assembly and Erection

Impact management outcome: No environmental degradation occurs as a result of steelwork assembly and erection.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– During assembly, care must be taken to ensure that no wasted/unused materials are left on site e.g. bolts and nuts						

– Emergency repairs due to breakages of equipment must be managed in accordance with ***Section 5. 18: Workshop, equipment maintenance and storage*** and ***Section 5.16: Emergency procedures***.						

5.30 Cabling and Stringing

Impact management outcome: No environmental degradation occurs as a result of stringing.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Residual solid waste (off cuts etc.) shall be recycled or disposed of in accordance with **Section *6.8: Solid waste and hazardous Management***; – Management of equipment used for installation shall be conducted in accordance with **Section *5.18: Workshop, equipment maintenance and storage***; – Management hazardous substances and any associated spills shall be conducted in accordance with ***Section 5.17: Hazardous substances***.						

5.31 Testing and Commissioning (all equipment testing, earthing system, system integration)

Impact management outcome: No environmental degradation occurs as a result of Testing and Commissioning.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Residual solid waste must be recycled or disposed of in accordance with ***Section 5.8: Solid waste and hazardous management***.						

5.32 Socio-economic

Impact management outcome: enhanced socio-economic development.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Develop and implement communication strategies to facilitate public participation; – Develop and implement a collaborative and constructive approach to conflict resolution as part of the external stakeholder engagement process; – Sustain continuous communication and liaison with neighboring owners and residents – Create work and training opportunities for local stakeholders; and – Where feasible, no workers, with the exception of security personnel, must be permitted to stay over-night on the site. This would reduce the risk to local farmers.						

5.33 Temporary closure of site

Impact management outcome: Minimise the risk of environmental impact during periods of site closure greater than five days.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Bunds must be emptied (where applicable) and need to be undertaken in accordance with the impact management actions included in ***sections 5.17: Hazardous substances and 5.18: Workshop, equipment maintenance and storage***; – Hazardous storage areas must be well ventilated; – Fire extinguishers must be serviced and accessible. Service records to be filed and audited at last service;						

– Emergency and contact details displayed must be displayed; – Security personnel must be briefed and have the facilities to contact or be contacted by relevant management and emergency personnel; – Night hazards such as reflectors, lighting, traffic signage etc. must have been checked; – Fire hazards identified and the local authority must have been notified of any potential threats e.g. large brush stockpiles, fuels etc.; – Structures vulnerable to high winds must be secured; – Wind and dust mitigation must be implemented; – Cement and materials stores must have been secured; – Toilets must have been emptied and secured; – Refuse bins must have been emptied and secured; – Drip trays must have been emptied and secured.						

5.34 Dismantling of old equipment

Impact management outcome: Impact to the environment to be minimised during the dismantling, storage and disposal of old equipment commissioning.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All old equipment removed during the project must be stored in such a way as to prevent pollution of the environment; – Oil containing equipment must be stored to prevent leaking or be stored on drip trays; – All scrap steel must be stacked neatly and any disused and broken insulators must be stored in containers; – Once material has been scrapped and the contract has been placed for removal, the disposal Contractor must						

ensure that any equipment containing pollution causing substances is dismantled and transported in such a way as to prevent spillage and pollution of the environment; – The Contractor must also be equipped to contain and clean up any pollution causing spills; and – Disposal of unusable material must be at a licensed waste disposal site.						

5.35 Landscaping and rehabilitation

Impact management outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All areas disturbed by construction activities must be subject to landscaping and rehabilitation; All spoil and waste must be disposed of to a registered waste site; – All slopes must be assessed for contouring, and to contour only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983 – All slopes must be assessed for terracing, and to terrace only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983; – Berms that have been created must have a slope of 1:4 and be replanted with indigenous species and grasses that approximates the original condition; – Where new access roads have crossed cultivated farmlands, that lands must be rehabilitated by ripping which must be agreed to by the holder of the EA and the landowners; – Rehabilitation of access roads outside of farmland; – Indigenous species must be used for with species and/grasses to where it compliments or approximates the						

original condition; – Stockpiled topsoil must be used for rehabilitation (refer to ***Section 5.24: Stockpiling and stockpiled areas***); – Stockpiled topsoil must be evenly spread so as to facilitate seeding and minimise loss of soil due to erosion; – Before placing topsoil, all visible weeds from the placement area and from the topsoil must be removed; – Subsoil must be ripped before topsoil is placed; – The rehabilitation must be timed so that rehabilitation can take place at the optimal time for vegetation establishment; – Where impacted through construction related activity, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled; – Sloped areas stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly; – Spoil can be used for backfilling or landscaping as long as it is covered by a minimum of 150 mm of topsoil. – Where required, re-vegetation including hydro-seeding can be enhanced using a vegetation seed mixture as described below. A mixture of seed can be used provided the mixture is carefully selected to ensure the following: a) Annual and perennial plants are chosen; b) Pioneer species are included; c) Species chosen must be indigenous to the area with the seeds used coming from the area; d) Root systems must have a binding effect on the soil; e) The final product must not cause an ecological imbalance in the area						

6 ACCESS TO THE GENERIC EMPr

Once completed and signed, to allow the public access to the generic EMPr, the holder of the EA must make the EMPr available to the public in accordance with the requirements of Regulation 26(h) of the EIA Regulations.

PART B: SECTION 2

7. SITE SPECIFIC INFORMATION AND DECLARATION

7.1 Sub-section 1: contact details and description of the project

7.1.1 Details of the applicant:

Igolide Wind (Pty) Ltd is the project proponent (Applicant) with regards to this application for the construction and operation of the Igolide Wind Energy Facility(WEF).

Proponent:	Igolide Wind (Pty) Ltd
Contact Person:	Mercia Grimbeek/Mmakoena Mmola
Postal Address	Suite 104, Albion Springs, 183 Main Road, Rondebosch, Cape Town, South Africa, 7700
Telephone:	071 752 8033
Email:	Mercia.Grimbeek@enertrag.com / mmakoena.mmola@enertrag.com

7.1.2 Details and expertise of the EAP:

WSP was appointed in the role of Independent EAP to undertake the S&EIA process for the proposed project. The CV of the EAP is available in Appendix A of the Site Specific EMPr. The EAP declaration of interest and undertaking is included in Appendix B of the Site Specific EMPr.

EAP	WSP Group Africa (PTY) Ltd
Company Registration:	1999/008928/07
Contact Person:	Ashlea Strong
Physical Address:	Building C, Knightsbridge, 33 Sloane Street, Bryanston, Johannesburg
Postal Address:	P.O. Box 98867, Sloane Park 2151, Johannesburg
Telephone:	011 361 1392
Fax:	011 361 1381
Email:	Ashlea.Strong@wsp.com
EAP Qualifications:	• Masters in Environmental Management, University of the Free State • B Tech, Nature Conservation, Technikon SA • National Diploma in Nature Conservation, Technikon SA

EAPASA Registration Number:	EAPASA (2019/1005)

7.1.3 Project name: **Igolide Wind Energy Facility**

7.1.4 Description of the project:

The Igolide Wind Energy Facility, with an installed capacity of up to 100MW, including associated and grid connection infrastructure, is proposed to be developed near Fochville in the Gauteng Province.

The proposed Project will be developed within a project area of approximately 680 hectares (ha). Within this project area, the extent of the Project footprint will be approximately 64ha, including linear infrastructure (i.e., roads).

Project infrastructure:

The proposed project will comprise the following key components:

Igolide WEF	Description
Capacity:	Up to 100MW
Total Site extent	680ha
Project Footprint (Buildable area)	64ha (including linear infrastructure, i.e., roads)
No. of turbines:	10
Turbine hub height:	Up to 200m
Rotor Diameter:	Up to 200m
Tip Height :	Up to 300m
Foundation:	Approximately 25m diameter x 3m deep. Volume to be excavated will be approximately 2 200m^3, in sandy soils due to access requirements and safe slope stability requirements.
Turbine Hardstand:	Hardstand does not require concrete. Area required will be approximately 1 ha per turbine.
Tower Type	Steel or concrete towers can be utilised at the site. Alternatively, the towers can be of a hybrid nature, comprising concrete towers and top steel sections.
On-site IPP substation and battery energy storage system (BESS):	The total footprint for the on-site substation, including the BESS, will be up to 2.5ha in extent. The on-site IPP portion substation will consist of a high voltage substation yard to allow for multiple 132kV feeder bays and transformers, control building, telecommunication infrastructure, and other substation components, as required. A 500m buffer around the on-site IPP substation has been assessed to ensure flexibility in routing the powerline. The BESS storage capacity will be up to 400 megawatt-hour (MWh) . 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 as 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. The BESS components will arrive on site pre-assembled.
Grid (to form part of a separate application for EA)	A single or double circuit 132kV overhead powerline and 132kV switching station (with a footprint of approximately 1.5ha, to be located adjacent to the on-site IPP substation) to feed the electricity generated by the proposed WEF into the national grid. A corridor of up to 250m in width (125m on either side of the centre line) has been identified for the placement of the 132kV single or double circuit power line to allow flexibility in the design of the final powerline route, and for the avoidance of sensitive environmental features (where possible).
Cables:	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, connecting the turbines to the on-site IPP substation.
Operations and Maintenance (O&M) building and storerooms:	The Operations and Maintenance ("O&M") building footprint will be located near the on-site substation. Typical areas include: • Operations building of 200m^2 • Workshop and stores area of ~300m^2 • Refuse area for temporary waste storage and conservancy tanks to service ablution facility. The total combined area of the buildings will not exceed 5 000m^2.
Construction camps:	The construction camp will house the contractor offices, ablution facilities, mess area, etc., and will have a footprint of approximately 1ha. The construction camp will be demolished after commercial operations date and the area rehabilitated.
Temporary laydown or staging areas:	The laydown area will be used for the storage of equipment or components that will be incorporated into the facility (such as electrical cables) as well as non-facility related equipment and components such as shipping frames, concrete shuttering, etc. The laydown area will also be used for the storage (and filling of vehicles) of diesel fuel. The laydown area will have a footprint of up to 2ha, which could increase to 3ha for concrete towers, should they be required. The laydown area will be demolished after commercial operations date and the area rehabilitated.
Cement Batching Plant (temporary):	The cement batching plant will be used to mix and blend cement, water, sand and aggregates to form quality concrete to be used for foundations. The cement batching plant will have a footprint of approximately 1ha.
Access and Internal Roads:	Access and internal roads will have a width of 8 - 10m, increasing up to 20m for turning circle/bypass areas to allow for larger component transport. The access and internal roads will be placed within a corridor of up to 20m width to accommodate cable trenches, stormwater channels and turning circle/bypass areas of up to 20m. Existing access roads will be used where possible to minimise impact. Where required, the width of the existing roads will be widened to ensure the passage of vehicles.
Supporting Infrastructure:	• Fencing;

	• Lighting; • Lightning protection; • Telecommunication infrastructure; • Stormwater channels; • Water pipelines; • Offices; • Operational and control centre; • Operations and maintenance area / warehouse / workshop; • Ablution facilities; • Gatehouse; • Security building; • Visitor's centre; and • Substation building.

7.1.5 Project location:

The proposed Igolide WEF is located near Fochville, within the within the Merafong City Local Municipality (MCLM) in the Gauteng Province.

The details of the properties associated with the proposed Igolide WEF, including the on-site IPP substation, and the 21-digit Surveyor General (SG) codes for the cadastral land parcels are outlined in Table 1. The co-ordinates of the cadastral land parcels are included in Table 2.

The coordinates of the onsite IPP Substation/ BESS are included in Tables 3.

Table 1– Igolide WEF Affected Farm Portions

Farm Name	21 Digit Surveyor General Code of Each Cadastral Land Parcel
Portion 14 of Farm Kraalkop 147IQ	T0IQ00000000014700014
Portion 20 of Farm Kraalkop 147IQ	T0IQ00000000014700020
Portion RE/22 of Farm Kraalkop 147IQ	T0IQ00000000014700022
Portion 8 of Farm Leeuwpoort 356IQ	T0IQ00000000035600008
Portion 57 of Farm Leeuwpoort 356IQ	T0IQ00000000035600057
Portion 65 of Farm Leeuwpoort 356IQ	T0IQ00000000035600065
Portion 66 of Farm Leeuwpoort 356IQ	T0IQ00000000035600066

Table 2 – Coordinate Points of the Cadastral Land Parcel

Point	**Longitude**	**Latitude**
A	27° 30' 50.047" E	26° 26' 5.747" S
B	27° 31' 32.289" E	26° 26' 13.501" S
C	27° 31' 39.568" E	26° 26' 28.680" S
D	27° 32' 20.572" E	26° 26' 32.606" S
E	27° 32' 36.103" E	26° 26' 44.983" S
F	27° 32' 53.684" E	26° 26' 47.071" S
G	27° 32' 53.035" E	26° 26' 53.296" S
H	27° 32' 37.320" E	26° 26' 54.822" S
I	27° 32' 28.738" E	26° 26' 58.974" S
J	27° 32' 22.374" E	26° 26' 52.723" S
K	27° 31' 14.239" E	26° 27' 10.363" S
L	27° 31' 21.840" E	26° 27' 35.790" S
M	27° 31' 4.426" E	26° 27' 45.540" S
N	27° 30' 25.098" E	26° 27' 40.909" S
O	27° 30' 7.192" E	26° 28' 3.540" S

Point	Longitude	Latitude
P	27° 29' 45.366" E	26° 28' 9.938" S
Q	27° 29' 50.180" E	26° 27' 56.916" S
R	27° 29' 55.494" E	26° 27' 55.937" S
S	27° 30' 2.002" E	26° 27' 50.516" S
T	27° 30' 2.742" E	26° 27' 42.073" S
U	27° 30' 11.233" E	26° 27' 25.277" S
V	27° 30' 11.509" E	26° 27' 17.954" S
W	27° 30' 17.013" E	26° 27' 17.823" S
X	27° 30' 15.705" E	26° 27' 9.177" S
Y	27° 29' 57.988" E	26° 27' 10.816" S
Z	27° 30' 2.347" E	26° 26' 53.984" S
AA	27° 30' 11.655" E	26° 26' 51.948" S
BB	27° 30' 26.639" E	26° 26' 55.606" S
CC	27° 30' 54.493" E	26° 26' 52.767" S
DD	27° 30' 44.013" E	26° 26' 25.541" S
EE	27° 30' 56.019" E	26° 26' 22.193" S

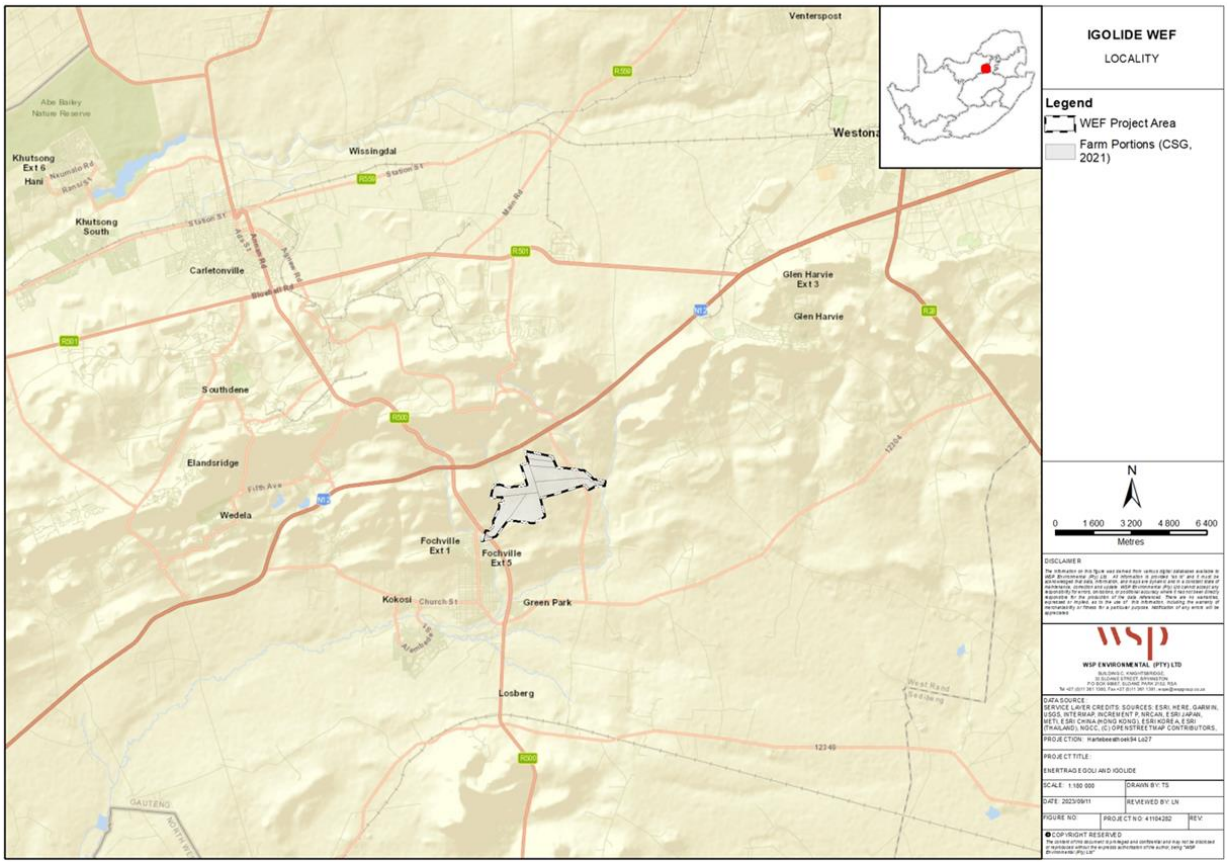


Figure 1: Regional locality map of Igolide WEF project area

7.2 Sub-section 2: Development footprint site map

This sub-section must include a map of the site sensitivity overlaid with the preliminary infrastructure layout. The sensitivity map must be prepared from the national web based environmental screening tool, when available for compulsory use at: https://screening.environment.gov.za/screeningtool. The sensitivity map shall identify the

nature of each sensitive feature e.g. threatened plant species, archaeological site, etc. Sensitivity maps shall identify features both within the planned working area and any known sensitive features within 50 m from the development footprint.

The map provided below has been compiled based on verified sensitivities through specialist studies, and relates to the Igolide WEF, which the on-site IPP substation is associated with.

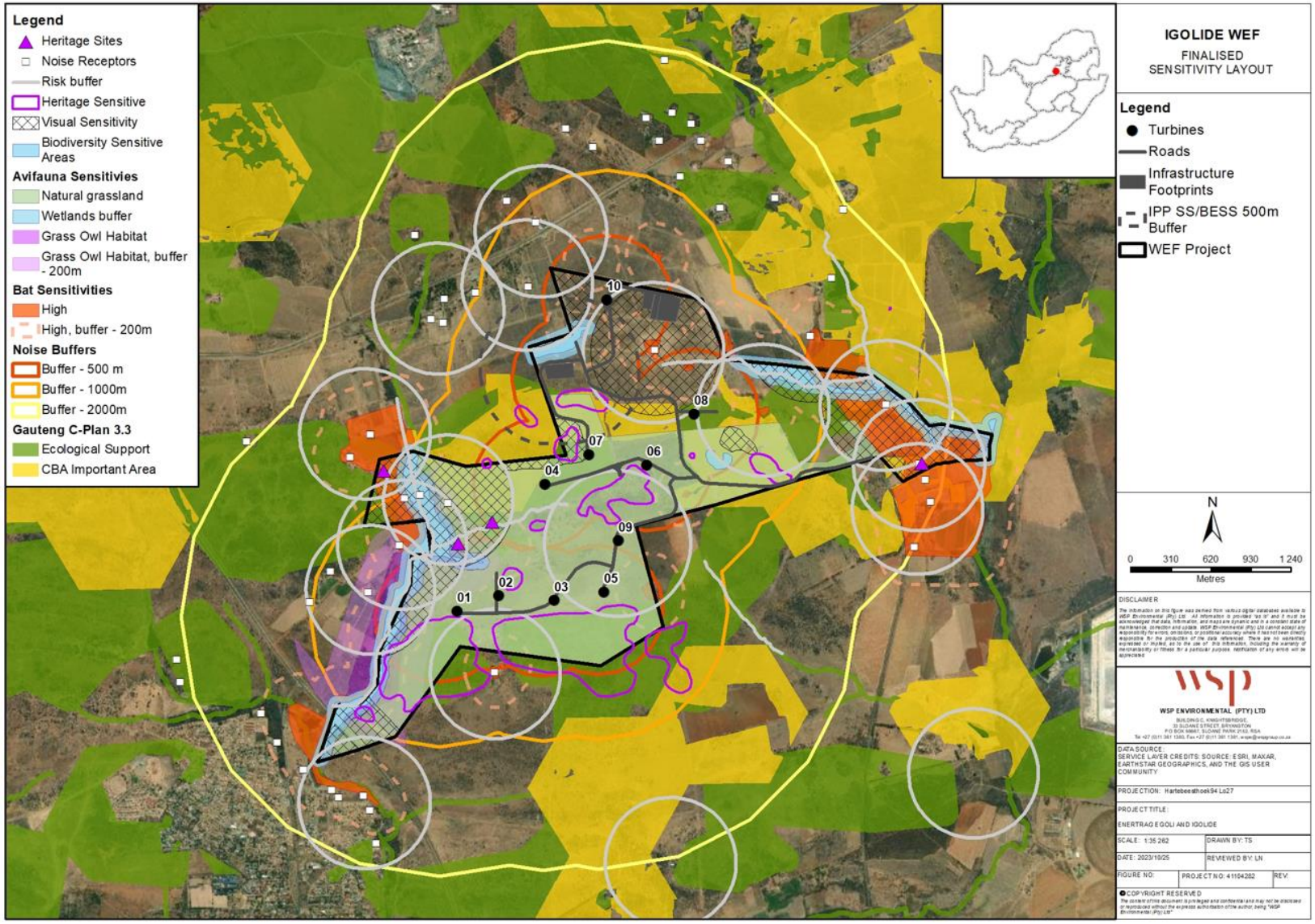


Figure 2: Igolide Final Layout Sensitivity Map

7.2 Sub-section 3: Declaration

The proponent/applicant or holder of the EA affirms that he/she will abide and comply with the prescribed impact management outcomes and impact management actions as stipulated in part B: section 1 of the generic EMPr and have the understanding that the impact management outcomes and impact management actions are legally binding. The proponent/applicant or holder of the EA affirms that he/she will provide written notice to the CA 14 day prior to the date on which the activity will commence of commencement of construction to facilitate compliance inspections.

Signature Proponent/applicant/ holder of EA Date:

Signature to be included with the Final Report

7.3 Sub-section 4: amendments to site specific information (Part B; section 2)

Should the EA be transferred to a new holder, Part B: Section 2 must be completed by the new holder and submitted with the application for an amendment of the EA in terms of Regulations 29 or 31 of the EIA Regulations, whichever applies. The information submitted for an amendment to an environmental authorisation will be considered to be incomplete should a signed copy of Part B: Section 2 not be submitted. Once approved, Part B: Section 2 forms part of the EMPr for the development and the EMPr becomes legally binding to the new EA holder.

PART C

8 SITE SPECIFIC ENVIRONMENTAL ATTRIBUTES

If any specific environmental sensitivities/attributes are present on the site which require more specific impact management outcomes and actions, not included in the pre-approved generic EMPr template, to manage impacts, those impact management outcomes and impact management actions must be included in this section. These specific management controls must be referenced spatially, and must include impact management outcomes and impact management actions. The management controls including impact management outcomes and impact management actions must be presented in the format of the pre-approved generic EMPr template. This applies only to additional impact management outcomes and impact management actions that are necessary.

If Part C is applicable to the development as authorised in the EA, it is required to be submitted to the CA together with the BAR or EIAR, for consideration of, and decision on, the application for EA. The information in this section must be prepared by an EAP and the name and expertise of the EAP, including the curriculum vitae are to be included. Once approved, Part C forms part of the EMPr for the site and is legally binding.

This section will **not be required** should the site contain no specific environmental sensitivities or attributes.

The overall site contains environmental sensitivities. The site specific mitigation measures for these attributes are included in Section 8 -of the Site Specific EMPr.

However, the substation site is not located on a sensitive area – therefore this section is deemed not applicable.

The Sensitivity Map is indicated in Figure 3 below

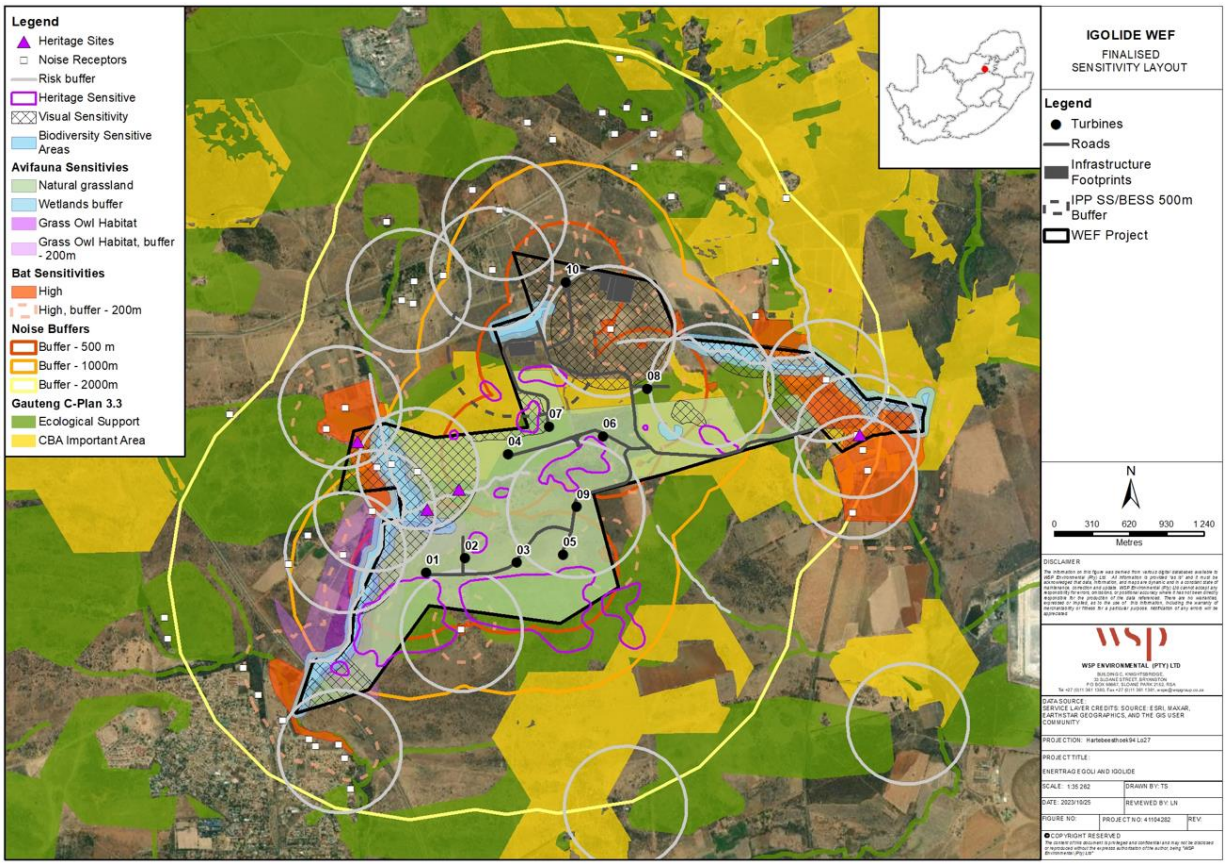


Figure 3: Igolide Final Layout Sensitivity Map

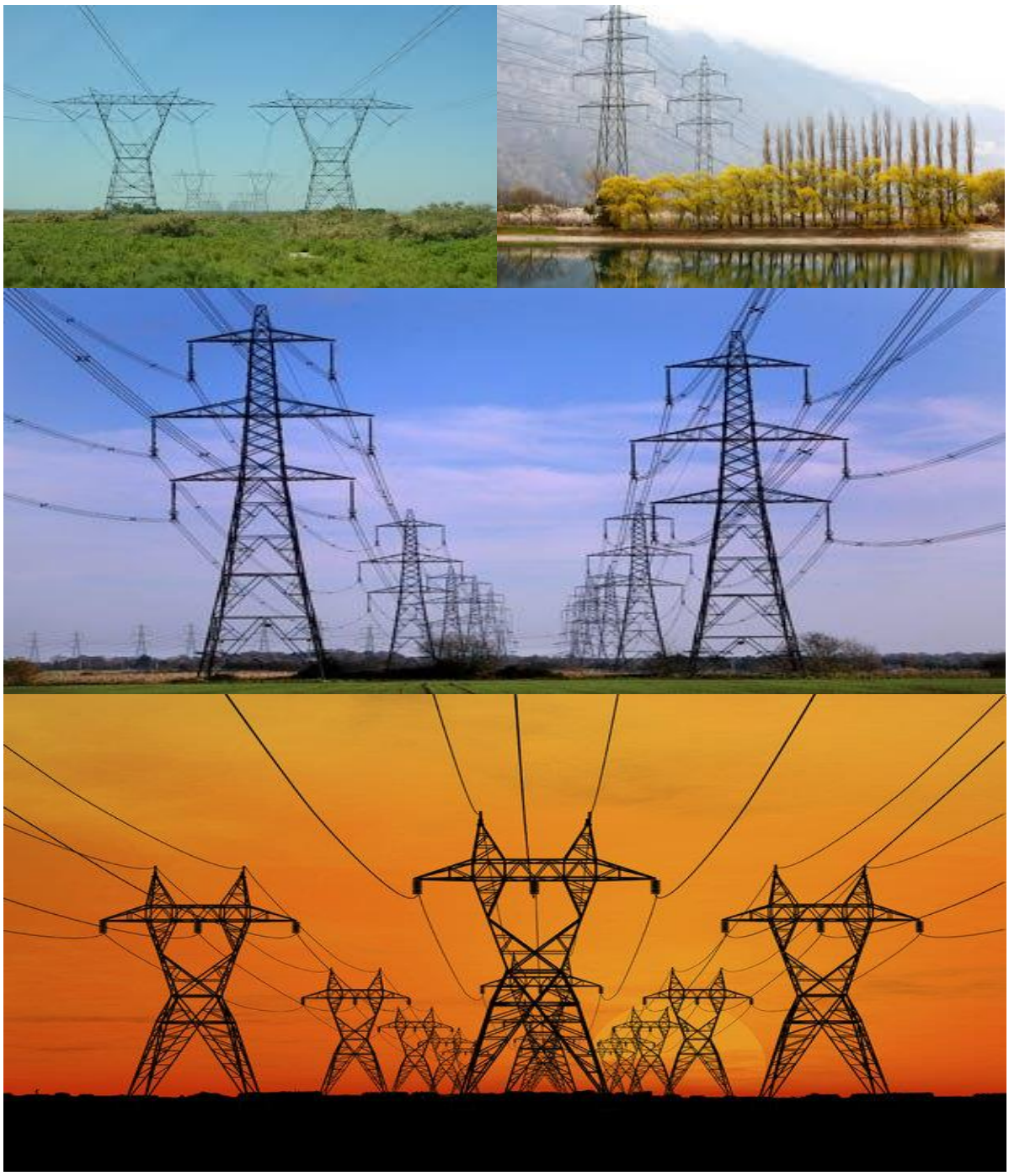
APPENDIX 1: METHOD STATEMENTS

To be prepared by the contractor prior to commencement of the activity. The method statements are **not required** to be submitted to the CA.

Appendix E

OHPL GENERIC EMPR

APPENDIX 1
GENERIC ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) FOR THE DEVELOPMENT AND EXPANSION FOR OVERHEAD ELECTRICITY TRANSMISSION AND DISTRIBUTION INFRASTRUCTURE



environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

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INTRODUCTION

1. Background

The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) requires that an environmental management programme (EMPr) be submitted where an environmental impact assessment (EIA) has been identified as the environmental instrument to be utilised as the basis for a decision on an application for environmental authorisation (EA). The content of an EMPr must either contain the information set out in Appendix 4 of the Environmental Impact Assessment Regulations, 2014, as amended, (EIA Regulations) or must be a generic EMPr relevant to an application as identified and gazetted by the Minister in a government notice. Once the Minister has identified, through a government notice, that a generic EMPr is relevant to an application for EA, that generic EMPr must be applied by all parties involved in the EA process, including, but not limited to, the applicant and the competent authority (CA).

2. Purpose

This document constitutes a generic EMPr relevant to applications for the development or expansion of overhead electricity transmission and distribution infrastructure, and all listed and specified activities necessary for the realisation of such infrastructure.

3. Objective

The objective of this generic EMPr is to prescribe and pre-approve generally accepted impact management outcomes and impact management actions, which can commonly and repeatedly be used for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of overhead electricity transmission and distribution infrastructure. The use of a generic EMPr is intended to reduce the need to prepare and review individual EMPrs for applications of a similar nature.

4. Scope

The scope of this generic EMPr applies to the development or expansion of overhead electricity transmission and distribution infrastructure requiring EA in terms of NEMA, i.e. with a capacity of 33 kilovolts or more. This generic EMPr applies to activities requiring EA, mainly activity 11 and 47 of the Environmental Impact Assessment Regulations Listing Notice 1 of 2014, as amended, and activity 9 of the Environmental Impact Assessment Regulations Listing Notice 2 of 2014, as amended, and all associated listed or specified activities necessary for the realisation of such infrastructure.

5. Structure of this document

This document is structured in three parts with an Appendix as indicated in the table below:

Part	Section	Heading	Content
A		Provides general guidance and information and is **not legally binding**	Definitions, acronyms, roles & responsibilities and documentation and reporting.
B	1	Pre-approved generic	Contains generally accepted impact

Part	Section	Heading	Content
		EMPr template	management outcomes and impact management actions required for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of overhead electricity transmission and distribution infrastructure, which are presented in the form of a template that has been pre-approved. The template in this section is to be completed by the contractor, with each completed page signed and dated by the holder of the EA prior to commencement of the activity. Where an impact management outcome is not relevant, the words "not applicable" can be inserted in the template under the "responsible persons" column. Once completed and signed, the template represents the EMPr for the activity approved by the CA and is legally binding. The template **is not required** to be submitted to the CA as once the generic EMPr is gazetted for implementation, it has been approved by the CA. To allow interested and affected parties access to the pre-approved EMPr template for consideration through the decision-making process, the EAP on behalf of the applicant /proponent must make the hard copy of this EMPr available at a public location and where the applicant has a website, the EMPr should also be made available on such publicly accessible website.
	2	Site specific information	Contains preliminary infrastructure layout and a declaration that the applicant/holder of the EA will comply with the pre-approved generic EMPr template contained in Part B: Section 1, and understands that the impact management outcomes and impact management actions are **legally binding**. The preliminary infrastructure layout must be finalized to inform the final EMPr that is to be submitted with the basic assessment report (BAR) or environmental impact assessment report (EIAR), ensuring that all impact management outcomes and actions have been either pre-approved or approved in terms of Part C.

Part	Section	Heading	Content
			This section **must be** submitted to the CA together with the final BAR or EIAR. The information submitted to the CA will be considered to be incomplete should a signed copy of Part B: section 2 not be submitted. Once approved, this Section forms part of the EMPr for the development and is legally binding.
C		Site specific sensitivities/ attributes	If any specific environmental sensitivities/ attributes are present on the site which require site specific impact management outcomes and impact management actions, not included in the pre-approved generic EMPr, to manage impacts, these specific impact management outcomes and impact management actions must be included in this section. These specific environmental attributes must be referenced spatially and impact management outcomes and impact management actions must be provided. These specific impact management outcomes and impact management actions must be presented in the format of the pre-approved EMPr template (Part B: section 1) This section will not be required should the site contain no specific environmental sensitivities or attributes. However, if Part C is applicable to the site, it **is required** to be submitted together with the BAR or EIAR, for consideration of, and decision on, the application for EA. The information in this section must be prepared by an EAP, and must contain his/her name and expertise including a curriculum vitae. Once approved, Part C forms part of the EMPr for the site and is legally binding. This section applies only **to additional** impact management outcomes and impact management actions that are necessary for the avoidance, management and mitigation of impacts and risks associated with the specific development or expansion and which are not already included in Part B: section 1.
Appendix 1			Contains the method statements to be prepared prior to commencement of the activity. The method statements are **not required** to be submitted to the competent authority.

6. Completion of part B: section 1: the pre-approved generic EMPr template

The template is to be completed prior to commencement of the activity, by providing the following information for each environmental impact management action:

- For implementation
  - a 'responsible person',
  - a method for implementation,
  - a timeframe for implementation
- For monitoring
  - a responsible person
  - frequency
  - evidence of compliance.

The completed template must be signed and dated by the holder of the EA prior to commencement of the activity. The method statements prepared and agreed to by the holder of the EA must be appended to the template as Appendix 1. Each method statement must be signed and dated on each page by the holder of the EA. This template, once signed and dated, is legally binding. The holder of the EA will remain responsible for its implementation.

7. Amendments of the impact management outcomes and impact management actions

Once the activity has commenced, a holder of an EA may make amendments to the impact management outcomes and impact management actions in the following manner:

- Amendment of the impact management outcomes: in line with the process contemplated in regulation 37 of the EIA Regulations; and
- Amendment of the impact management actions: in line with the process contemplated in regulation 36 of the EIA Regulations.

8. Documents to be submitted as part of part B: section 2 site specific information and declaration

Part B: Section 2 has three distinct sub-sections. The first and third sub-sections are in a template format. Sub-section two requires a map to be produced.

Sub-section 1 contains the project name, the applicant's name and contact details, the site information, which includes coordinates of the corridor in which the proposed overhead electricity transmission and distribution infrastructure is proposed as well as the 21-digit Surveyor General code of each cadastral land parcel and, where available, the farm name.

Sub-section 2 is to be prepared by an EAP and must contain his/her name and expertise including a curriculum vitae. This sub-section must include a map of the site sensitivity overlaid with the preliminary infrastructure layout using the national web based environmental screening tool, when available for compulsory use at: https://screening.environment.gov.za/screeningtool. The sensitivity map shall identify the nature of each sensitive feature e.g. raptor nest, threatened plant species, archaeological site, etc. Sensitivity maps must identify features both within the planned working area and any known sensitive features in the surrounding landscape within 50m from the development footprint. The overhead transmission and distribution profile must be illustrated at an appropriate resolution to enable fine scale interrogation. It is recommended that <20 km of overhead transmission and distribution length is illustrated per page in A3 landscape format.

Where considered appropriate, photographs of sensitive features in the context of tower positions must be used.

Sub-section 3 is the declaration that the applicant/proponent or holder of the EA in the case of a change of ownership must complete, which confirms that the applicant/EA holder will comply with the pre-approved generic EMPr template in Section 1 and understands that the impact management outcomes and actions are legally binding.

a) Amendments to Part B: Section 2 – site specific information and declaration

Should the EA be transferred, Part B: Section 2 must be completed by the new applicant/proponent and submitted with the application for an amendment of the EA in terms of Regulations 29 or 31 of the EIA Regulations, whichever applies. The information submitted as part of such an application for an amendment to an EA will be considered to be incomplete should a signed copy of Part B: Section 2 not be submitted. Once approved, Part B: Section 2 forms part of the EMPr for the development and the EMPr becomes legally binding to the new EA holder.

PART A – GENERAL INFORMATION

1. DEFINITIONS

In this EMPr any word or expression to which a meaning has been assigned in the NEMA or EIA Regulations has that meaning, and unless the context requires otherwise –

"clearing" means the clearing and removal of vegetation, whether partially or in whole, including trees and shrubs, as specified;

"construction camp" is the area designated for key construction infrastructure and services, including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management;

"contractor" - The Contractor has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract, are in line with the Environmental Management Programme and that Method Statements are implemented as described.

"hazardous substance" is a substance governed by the Hazardous Substances Act, 1973 (Act No. 15 of 1973) as well as the Hazardous Chemical and Substances Regulations, 1995;

"method statement" means a written submission by the Contractor to the Project Manager in response to this EMPr or a request by the Project Manager and ECO. The method statement must set out the equipment, materials, labour and method(s) the Contractor proposes using to carry out an activity identified by the Project Manager when requesting the Method Statement. This must be done in such detail that the Project Manager and ECO is able to assess whether the Contractor's proposal is in accordance with this specification and/or will produce results in accordance with this specification;

The method statement must cover applicable details with regard to:

(i) Construction procedures;
(ii) Plant, materials and equipment to be used;
(iii) Transporting the equipment to and from site;
(iv) How the plant/ material/ equipment will be moved while on site;
(v) How and where the plant/ material/ equipment will be stored;
(vi) The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
(vii) Timing and location of activities;
(viii) Compliance/ non-compliance; and
(ix) Any other information deemed necessary by the Project Manager.

"slope" means the inclination of a surface expressed as one unit of rise or fall for so many horizontal units;

"solid waste" means all solid waste, including construction debris, hazardous waste, excess cement/ concrete, wrapping materials, timber, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers);

"spoil" means excavated material which is unsuitable for use as material in the construction works or is material which is surplus to the requirements of the construction works;

"topsoil" means a varying depth (up to 300 mm) of the soil profile irrespective of the fertility, appearance, structure, agricultural potential, fertility and composition of the soil; and

"works" means the works to be executed in terms of the Contract

2. ACRONYMS and ABBREVIATIONS

CA	Competent Authority
cEO	Contractors Environmental Officer
dEO	Developer Environmental Officer
DPM	Developer Project Manager
DSS	Developer Site Supervisor
EAR	Environmental Audit Report
ECA	Environmental Conservation Act No. 73 of 1989
ECO	Environmental Control Officer
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
ERAP	Emergency Response Action Plan
EMPr	Environmental Management Programme Report
EAP	Environmental Assessment Practitioner
FPA	Fire Protection Agency
HCS	Hazardous chemical Substance
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act ,2004 (Act No. 10 of 2004)
NEMWA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
MSDS	Material Safety Data Sheet
RI&AP's	Registered interested and affected parties

3. ROLES AND RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) IMPLEMENTATION

The effective implementation of this generic EMPr is dependent on established and clear roles, responsibilities and reporting lines within an institutional framework. This section of the EMPr gives guidance to the various environmental roles and reporting lines, however, project specific requirements will ultimately determine the need for the appointment of specific person(s) to undertake specific roles and or responsibilities. As such, it must be noted that in the event that no specific person, for example, an environmental control officer (ECO) is appointed, the holder of the EA remains responsible for ensuring that the duties indicated in this document for action by the ECO are undertaken.

Table 1: *Guide to roles and responsibilities for implementation of an EMPr*

Responsible Person (s)	**Role and Responsibilities**
Developer's Project Manager (DPM)	Role The Project Developer is accountable for ensuring compliance with the EMPr and any conditions of approval from the competent authority (CA). Where required, an environmental control officer (ECO) must be contracted by the Project Developer to objectively monitor the implementation of the EMPr according to relevant environmental legislation, and the conditions of the environmental authorisation (EA). The Project Developer is further responsible for providing and giving mandate to enable the ECO to perform responsibilities, and he must ensure that the ECO is integrated as part of the project team while remaining independent. Responsibilities - Be fully conversant with the conditions of the EA; - Ensure that all stipulations within the EMPr are communicated and adhered to by the Developer and its Contractor(s); - Issuing of site instructions to the Contractor for corrective actions required; - Monitor the implementation of the EMPr throughout the project by means of site inspections and meetings. Overall management of the project and EMPr implementation; and - Ensure that periodic environmental performance audits are undertaken on the project implementation.
Developer Site Supervisor (DSS)	Role The DSS reports directly to the DPM, oversees site works, liaises with the contractor(s) and the ECO. The DSS is responsible for the day to day implementation of the EMPr and for ensuring the compliance of all

Responsible Person (s)	Role and Responsibilities
	contractors with the conditions and requirements stipulated in the EMPr. Responsibilities - Ensure that all contractors identify a contractor's Environmental Officer (cEO); - Must be fully conversant with the conditions of the EA. Oversees site works, liaison with Contractor, DPM and ECO; - Must ensure that all landowners have the relevant contact details of the site staff, ECO and cEO; - Issuing of site instructions to the Contractor for corrective actions required; - Will issue all non-compliances to contractors; and - Ratify the Monthly Environmental Report.
Environmental Control Officer (ECO)	Role The ECO should have appropriate training and experience in the implementation of environmental management specifications. The primary role of the ECO is to act as an independent quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts. In this respect, the ECO is to conduct periodic site inspections, attend regular site meetings, pre-empt problems and suggest mitigation and be available to advise on incidental issues that arise. The ECO is also required to conduct compliance audits, verifying the monitoring reports submitted by the cEO. The ECO provides feedback to the DSS and Project Manager regarding all environmental matters. The Contractor, cEO and dEO are answerable to the Environmental Control Officer for non- compliance with the Performance Specifications as set out in the EA and EMPr. The ECO provides feedback to the DSS and Project Manager, who in turn reports back to the Contractor and potential and Registered Interested &Affected Parties' (RI&AP's), as required. Issues of non-compliance raised by the ECO must be taken up by the Project Manager, and resolved with the Contractor as per the conditions of his contract. Decisions regarding environmental procedures, specifications and requirements which have a cost implication (i.e. those that are deemed to be a variation, not allowed for in the Performance Specification) must be endorsed by the Project Manager. The ECO must also, as specified by the EA, report to the relevant CA as and when required. Responsibilities The responsibilities of the ECO will include the following: - Be aware of the findings and conclusions of all EA related to the development;

Responsible Person (s)	Role and Responsibilities
	- Be familiar with the recommendations and mitigation measures of this EMPr; - Be conversant with relevant environmental legislation, policies and procedures, and ensure compliance with them; - Undertake regular and comprehensive site inspections / audits of the construction site according to the generic EMPr and applicable licenses in order to monitor compliance as required; - Educate the construction team about the management measures contained in the EMPr and environmental licenses; - Compilation and administration of an environmental monitoring plan to ensure that the environmental management measures are implemented and are effective; - Monitoring the performance of the Contractors and ensuring compliance with the EMPr and associated Method Statements; - In consultation with the Developer Site Supervisor order the removal of person(s) and/or equipment which are in contravention of the specifications of the EMPr and/or environmental licenses; - Liaison between the DPM, Contractors, authorities and other lead stakeholders on all environmental concerns; - Compile a regular environmental audit report highlighting any non-compliance issues as well as satisfactory or exceptional compliance with the EMPr; - Validating the regular site inspection reports, which are to be prepared by the contractor Environmental Officer (cEO); - Checking the cEO's record of environmental incidents (spills, impacts, legal transgressions etc) as well as corrective and preventive actions taken; - Checking the cEO's public complaints register in which all complaints are recorded, as well as action taken; - Assisting in the resolution of conflicts; - Facilitate training for all personnel on the site – this may range from carrying out the training, to reviewing the training programmes of the Contractor; - In case of non-compliances, the ECO must first communicate this to the Senior Site Supervisor, who has the power to ensure this matter is addressed. Should no action or insufficient action be taken, the ECO may report this matter to the authorities as non-compliance; - Maintenance, update and review of the EMPr; - Communication of all modifications to the EMPr to the relevant stakeholders.
developer Environmental Officer (dEO)	<u>Role</u> The dEOs will report to the Project Manager and are responsible for implementation of the EMPr, environmental monitoring and reporting, providing environmental input to the Project Manager and

Responsible Person (s)	Role and Responsibilities
	Contractor's Manager, liaising with contractors and the landowners as well as a range of environmental coordination responsibilities. <u>Responsibilities</u> - Be fully conversant with the EMPr; - Be familiar with the recommendations and mitigation measures of this EMPr, and implement these measures; - Ensure that all stipulations within the EMPr are communicated and adhered to by the Employees, Contractor(s) ; - Confine the development site to the demarcated area; - Conduct environmental internal audits with regards to EMPr and authorisation compliance (on cEO); - Assist the contractors in addressing environmental challenges on site; - Assist in incident management: - Reporting environmental incidents to developer and ensuring that corrective action is taken, and lessons learnt shared; - Assist the contractor in investigating environmental incidents and compile investigation reports; - Follow-up on pre-warnings, defects, non-conformance reports; - Measure and communicate environmental performance to the Contractor; - Conduct environmental awareness training on site together with ECO and cEO; - Ensure that the necessary legal permits and / or licenses are in place and up to date; - Acting as Developer's Environmental Representative on site and work together with the ECO and contractor;
Contractor	<u>Role</u> The Contractor appoints the cEO and has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract are in line with the EMPr and that Method Statements are implemented as described. External contractors must ensure compliance with this EMPr while performing the onsite activities as per their contract with the Project Developer. The contractors are required, where specified, to provide Method Statements setting out in detail how the impact management actions contained in the EMPr will be implemented during the development or expansion for overhead electricity transmission and distribution infrastructure activities.

Responsible Person (s)	Role and Responsibilities
	Responsibilities - project delivery and quality control for the development services as per appointment; - employ a suitably qualified person to monitor and report to the Project Developer's appointed person on the daily activities on-site during the construction period; - ensure that safe, environmentally acceptable working methods and practices are implemented and that equipment is properly operated and maintained, to facilitate proper access and enable any operation to be carried out safely; - attend on site meeting(s) prior to the commencement of activities to confirm the procedure and designated activity zones; - ensure that contractors' staff repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in EMPr, to the satisfaction of the ECO.
contractor Environmental Officer (cEO)	Role Each Contractor affected by the EMPr should appoint a cEO, who is responsible for the on-site implementation of the EMPr (or relevant sections of the EMPr). The Contractor's representative can be the site agent; site engineer; a dedicated environmental officer; or an independent consultant. The Contractor must ensure that the Contractor's Representative is suitably qualified to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other site Contractors, labourers, the Environmental Control Officer and the public. As a minimum the cEO shall meet the following criteria: Responsibilities - Be on site throughout the duration of the project and be dedicated to the project; - Ensure all their staff are aware of the environmental requirements, conditions and constraints with respect to all of their activities on site; - Implementing the environmental conditions, guidelines and requirements as stipulated within the EA, EMPr and Method Statements; - Attend the Environmental Site Meeting; - Undertaking corrective actions where non-compliances are registered within the stipulated timeframes; - Report back formally on the completion of corrective actions;

Responsible Person (s)	Role and Responsibilities
	- Assist the ECO in maintaining all the site documentation; - Prepare the site inspection reports and corrective action reports for submission to the ECO; - Assist the ECO with the preparing of the monthly report; and - Where more than one Contractor is undertaking work on site, each company appointed as a Contractor will appoint a cEO representing that company.

4. ENVIRONMENTAL DOCUMENTATION REPORTING AND COMPLIANCE

To ensure accountable and demonstrated implementation of the EMPr, a number of reporting systems, documentation controls and compliance mechanisms must be in place for all overhead electricity transmission and distribution infrastructure projects as a minimum requirement.

4.1 Document control/Filing system

The holder of the EA is solely responsible for the upkeep and management of the EMPr file. At a minimum, all documentation detailed below will be stored in the EMPr file. A hard copy of all documentation shall be filed, while an electronic copy may be kept where relevant. A duplicate file will be maintained in the office of the DSS (where applicable). This duplicate file must remain current and up-to-date. The filing system must be updated and relevant documents added as required. The EMPr file must be made available at all times on request by the CA or other relevant authorities. The EMPr file will form part of any environmental audits undertaken as prescribed in the EIA Regulations.

4.2 Documentation to be available

At the outset of the project the following preliminary list of documents shall be placed in the filing system and be accessible at all times:

- Full copy of the signed EA from the CA in terms of NEMA, granting approval for the development or expansion;
- Copy of the generic and site specific EMPr as well as any amendments thereof;
- Copy of declaration of implementing generic EMPr and subsequent approval of site specific EMPr and amendments thereof;
- All method statements;
- Completed environmental checklists;
- Minutes and attendance register of environmental site meetings;
- An up-to-date environmental incident log;
- A copy of all instructions or directives issued;
- A copy of all corrective actions signed off. The corrective actions must be filed in such a way that a clear reference is made to the non-compliance record;
- Complaints register.

4.3 Weekly Environmental Checklist

The ECOs are required to complete a Weekly Environmental Checklist, the format of which is to be agreed prior to commencement of the activity. The ECOs are required to sign and date the checklist, retain a copy in the EMPr file and submit a copy of the completed checklist to the DSS on a weekly basis.

The checklists will form the basis for the Monthly Environmental Reports. Copies of all completed checklists will be attached as Annexures to the Environmental Audit Report as required in terms of the EIA Regulations.

4.4 Environmental site meetings

Minutes of the environmental site meetings shall be kept. The minutes must include an attendance register and will be attached to the Monthly Report that is distributed to

attendees. Each set of minutes must clearly record "Matters for Attention" that will be reviewed at the next meeting.

4.5 Required Method Statements

The method statement will be done in such detail that the ECOs are enabled to assess whether the contractor's proposal is in accordance with the EMPr.

The method statement must cover applicable details with regard to:

- development procedures;
- materials and equipment to be used;
- getting the equipment to and from site;
- how the equipment/ material will be moved while on site;
- how and where material will be stored;
- the containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- timing and location of activities;
- compliance/ non-compliance with the EMPr; and
- any other information deemed necessary by the ECOs.

Unless indicated otherwise by the Project Manager, the Contractor shall provide the following method statements to the Project Manager no less than 14 days prior to the commencement date of the activity:

- Site establishment – Camps, Lay-down or storage areas, satellite camps, infrastructure;
- Batch plants;
- Workshop or plant servicing;
- Handling, transport and storage of Hazardous Chemical Substance's;
- Vegetation management – Protected, clearing, aliens, felling;
- Access management – Roads, gates, crossings etc.;
- Fire plan;
- Waste management – transport, storage, segregation, classification, disposal (all waste streams);
- Social interaction – complaints management, compensation claims, access to properties etc.;
- Water – use (source, abstraction and disposal), access and all related information, crossings and mitigation;
- Emergency preparedness – Spills, training, other environmental emergencies;
- Dust and noise management methodologies;
- Fauna interaction and risk management – only if the risk was identified – wildlife interaction especially on game farms; and
- Heritage and palaeontology management.

The ECOs shall monitor and ensure that the contractors perform in accordance with these method statements. Completed and agreed method statements between the holder of the EA and the contractor shall be captured in Appendix 1.

4.6 Environmental Incident Log (Diary)

The ECOs are required to maintain an up-to-date and current Environmental Incident Log (environmental diary). The Environmental Incident Log is a means to record all environmental incidents and/or all non-compliance notice would not be issued. An environmental incident is defined as:

- Any deviation from the listed impact management actions (listed in this EMPr) that may be addressed immediately by the ECOs. (For example a contractor's staff member littering or a drip tray that has not been emptied);
- Any environmental impact resulting from an action or activity by a contractor in contravention of the environmental stipulations and guidelines listed in the EMPr which as a single event would have a minor impact but which if cumulative and continuous would have a significant effect (for example no toilet paper available in the ablutions for an afternoon); and
- General environmental information such as road kills or injured wildlife.

The ECOs are to record all environmental incidents in the Environmental Incident Log. All incidents regardless of severity must be reported to the Developer. The Log is to be kept in the EMPr file and at a minimum the following will be recorded for each environmental incident:

- The date and time of the incident;
- Description of the incident;
- The name of the Contractor responsible;
- The incident must be listed as significant or minor;
- If the incident is listed as significant, a non-compliance notice must be issued, and recorded in the log;
- Remedial or corrective action taken to mitigate the incident; and
- Record of repeat minor offences by the same contractor or staff member.

The Environmental Incident Log will be captured in the EAR.

4.7 Non-compliance

A non-compliance notice will be issued to the responsible contractor by the ECOs via the DSS or Project Manager. The non-compliance notice will be issued in writing; a copy filed in the EMPr file and will at a minimum include the following:

- Time and date of the non-compliance;
- Name of the contractor responsible;
- Nature and description of the non-compliance;
- Recommended / required corrective action; and
- Date by which the corrective action to be completed.
- The contractors shall act immediately when a notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the development site pertaining to the environment shall be recorded in a dedicated register and the response noted with the date and action taken. The ECO should be made aware of any complaints. Any non-compliance with the agreed procedures of the EMPr is a transgression of the various statutes and laws that define the manner by which the environment is managed. Failure to redress the cause shall be reported to the relevant CA for them to deal with the transgression, as it deems fit. The contractor is deemed not to have complied with the EMPr if, inter alia, There is a deviation from the environmental conditions, impact management outcomes and impact management actions , as approved in generic and site specific EMPr as relevant as set out in the EMPr, which deviation has, or may cause, an environmental impact.

4.8 Corrective action records

For each non-compliance notice issued, a documented corrective action must be recorded. On receiving a non-compliance notice from the DSS, the contractor's cEO will ensure that the corrective actions required take place within the stipulated timeframe. On completion of the corrective action the cEO is to issue a Corrective Action Report in writing to the ECOs. If satisfied that the corrective action has been completed, the ECOs are to sign-off on the Corrective Action Report, and attach the report to the non-compliance notice in the EMPr file. A corrective action is considered complete once the report has signed off by the ECOs.

4.9 Photographic record

A digital photographic record will be kept. The photographic record will be used to show before, during and post rehabilitation evidence of the project as well used in cases of damages claims if they arise. Each image must be dated and a brief description note attached.

The Contractor shall:

1. Allow the ECOs access to take photographs of all areas, activities and actions.

The ECOs shall keep an electronic database of photographic records which will include:

1. Pictures of all areas designated as work areas, camp areas, development sites and storage areas taken before these areas are set up;
2. All bunding and fencing;
3. Road conditions and road verges;
4. Condition of all farm fences;
5. Topsoil storage areas;
6. All areas to be cordoned off during construction;
7. Waste management sites;
8. Ablution facilities (inside and out);
9. Any non-conformances deemed to be "significant";
10. All completed corrective actions for non-compliances;
11. All required signage;
12. Photographic recordings of incidents;
13. All areas before, during and post rehabilitation; and
14. Include relevant photographs in the Final Environmental Audit Report.

4.10 Complaints register

The ECOs shall keep a current and up-to-date complaints register. The complaints register is to be a record of all complaints received from communities, stakeholders and individuals. The Complaints Record shall:

1. Record the name and contact details of the complainant;
2. Record the time and date of the complaint;
3. Contain a detailed description of the complaint;
4. Where relevant and appropriate, contain photographic evidence of the complaint or damage (ECOs to take relevant photographs); and
5. Contain a copy of the ECOs written response to each complaint received and keep a record of any further correspondence with the complainant. The ECO's written

response will include a description of any corrective action to be taken and must be signed by the Contractor, ECO and affected party. Where a damage claim is issued by the complainant, the ECOs shall respond as described in (**section 4.11**) below.

4.11 Claims for damages

In the event that a Claim for Damages is submitted by a community, landowner or individual, the ECOs shall:

1. Record the full detail of the complaint as described in (**section 4.10**) above;
2. The DPM will evaluate the claim and associated damage and submit the evaluation to the Senior Site Representative for approval;
3. Following consideration by the DPM, the claim is to be resolved and settled immediately, or the reason for not accepting the claim communicated in writing to the claimant. Should the claimant not accept this, the ECO shall, in writing report the incident to the Developer's negotiator and legal department; and
4. A formal record of the response by the ECOs to the claimant as well as the rectification of the method of making payments not amount will be recorded in the EMPr file.

4.12 Interactions with affected parties

Open, transparent and good relations with affected landowners, communities and regional staff are an essential aspect to the successful management and mitigation of environmental impacts.

The ECOs shall:

1. Ensure that all queries, complaints and claims are dealt within an agreed timeframe;
2. Ensure that any or all agreements are documented, signed by all parties and a record of the agreement kept in the EMPr file;
3. Ensure that a complaints telephone numbers are made available to all landowners and affected parties; and
4. Ensure that contact with affected parties is courteous at all times;

4.13 Environmental audits

Internal environmental audits of the activity and implementation of the EMPr must be undertaken. The findings and outcomes must be included in the EMPr file and be submitted to the CA at intervals as indicated in the EA.

An Environmental Audit Report must be prepared monthly. The report will be tabled as the key point on the agenda of the Environmental Site Meeting. The Report is submitted for acceptance at the meeting and the final report will be circulated to the Project Manager and filed in the EMPr file. At a frequency determined by the EA, the ECOs shall submit the monthly reports to the CA. At a minimum the monthly report is to cover the following:

- Weekly Environmental Checklists;
- Deviations and non-compliances with the checklists;
- Non-compliances issued;
- Completed and reported corrective actions;
- Environmental Monitoring;

- General environmental findings and actions; and
- Minutes of the Bi-monthly Environmental Site Meetings.

4.14 Final environmental audits

On final completion of the rehabilitation and/or requirements of the EA a final EAR is to be prepared and submitted to the CA. The EAR must comply with Appendix 7 of the EIA Regulations.

PART B: SECTION 1: Pre-approved generic EMPr template

5. IMPACT MANAGEMENT OUTCOMES AND IMPACT MANAGEMENT ACTIONS

This section provides a pre-approved generic EMPr template with aspects that are common to the development of overhead electricity transmission and distribution infrastructure. There is a list of aspects identified for the development or expansion of overhead electricity transmission and distribution infrastructure, and for each aspect a set of prescribed impact management outcomes and associated impact management actions have been identified. Holders of EAs are responsible to ensure the implementation of these outcomes and actions for all projects as a minimum requirement, in order to mitigate the impact of such aspects identified for the development or expansion of overhead electricity transmission and distribution infrastructure.

The template provided below is to be completed by providing the information under each heading for each environmental impact management action.

The completed template must be signed and dated on each page by both the contractor and the holder of the EA prior to commencement of the activity. The method statements prepared and agreed to by the holder of the EA must be appended to the template as Appendix 1. Each method statement must also be duly signed and dated on each page by the contactor and the holder of the EA. This template, once signed and dated, is legally binding. The holder of the EA will remain responsible for its implementation.

5.1 Environmental awareness training

Impact management outcome: All onsite staff are aware and understands the individual responsibilities in terms of this EMPr.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All staff must receive environmental awareness training prior to commencement of the activities; – The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course; – Refresher environmental awareness training is available as and when required; – All staff are aware of the conditions and controls linked to the EA and within the EMPr and made aware of their individual roles and responsibilities in achieving compliance with the EA and EMPr; – The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum: a)Safety notifications; and b) No littering. – Environmental awareness training must include as a minimum the following: a) Description of significant environmental impacts, actual or potential, related to their work activities; b) Mitigation measures to be implemented when carrying out specific activities; c) Emergency preparedness and response procedures; d) Emergency procedures; e) Procedures to be followed when working near or						

within sensitive areas; f) Wastewater management procedures; g) Water usage and conservation; h) Solid waste management procedures; i) Sanitation procedures; j)Fire prevention; and k) Disease prevention. – A record of all environmental awareness training courses undertaken as part of the EMPr must be available; – Educate workers on the dangers of open and/or unattended fires; – A staff attendance register of all staff to have received environmental awareness training must be available. – Course material must be available and presented in appropriate languages that all staff can understand.						

5.2 Site Establishment development

Impact management outcome: Impacts on the environment are inimized during site establishment and the development footprint are kept to demarcated development area.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– A method statement must be provided by the contractor prior to any onsite activity that includes the layout of the construction camp in the form of a plan showing the location of key infrastructure and services (where applicable), including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous materials storage areas (including fuels), the batching plant (if						

one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management; – Location of camps must be within approved area to ensure that the site does not impact on sensitive areas identified in the environmental assessment or site walk through; – Sites must be located where possible on previously disturbed areas; – The camp must be fenced in accordance with ***Section 5.5: Fencing and gate installation***; and – The use of existing accommodation for contractor staff, where possible, is encouraged.						

5.3 Access restricted areas

Impact management outcome: Access to restricted areas prevented.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Identification of access restricted areas is to be informed by the environmental assessment, site walk through and any additional areas identified during development; – Erect, demarcate and maintain a temporary barrier with clear signage around the perimeter of any access restricted area, colour coding could be used if appropriate; and – Unauthorised access and development related activity inside access restricted areas is prohibited.						

5.4 Access roads

Impact management outcome: Minimise impact to the environment through the planned and restricted movement of vehicles on site.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Access to the servitude and tower positions must be negotiated with the relevant landowner and must fall within the assessed and authorised area; – An access agreement must be formalised and signed by the DPM, Contractor and landowner before commencing with the activities; – The access roads to tower positions must be signposted after access has been negotiated and before the commencement of the activities; – All private roads used for access to the servitude must be maintained and upon completion of the works, be left in at least the original condition – All contractors must be made aware of all these access routes. – Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the contractor's expense; – Maximum use of both existing servitudes and existing roads must be made to minimize further disturbance through the development of new roads; – In circumstances where private roads must be used, the condition of the said roads must be recorded in accordance with ***section 4.9: photographic record***; prior to use and the condition thereof agreed by the landowner, the DPM, and the contractor; – Access roads in flattish areas must follow fence lines and tree belts to avoid fragmentation of vegetated areas or						

croplands – Access roads must only be developed on pre-planned and approved roads.						

5.5 Fencing and Gate installation

Impact management outcome: Minimise impact to the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Use existing gates provided to gain access to all parts of the area authorised for development, where possible; – Existing and new gates to be recorded and documented in accordance with **section *4.9: photographic record***; – All gates must be fitted with locks and be kept locked at all times during the development phase, unless otherwise agreed with the landowner; – At points where the line crosses a fence in which there is no suitable gate within the extent of the line servitude, on the instruction of the DPM, a gate must be installed at the approval of the landowner; – Care must be taken that the gates must be so erected that there is a gap of no more than 100 mm between the bottom of the gate and the ground; – Where gates are installed in jackal proof fencing, a suitable reinforced concrete sill must be provided beneath the gate; – Original tension must be maintained in the fence wires; – All gates installed in electrified fencing must be re-electrified; – All demarcation fencing and barriers must be maintained in good working order for the duration of overhead transmission and distribution electricity infrastructure						

development activities; – Fencing must be erected around the camp, batching plants, hazardous storage areas, and all designated access restricted areas, where appropriate and would not cause harm to the sensitive flora; – Any temporary fencing to restrict the movement of life-stock must only be erected with the permission of the land owner. – All fencing must be developed of high quality material bearing the SABS mark; – The use of razor wire as fencing must be avoided; – Fenced areas with gate access must remain locked after hours, during weekends and on holidays if staff is away from site. Site security will be required at all times; – On completion of the development phase all temporary fences are to be removed; – The contractor must ensure that all fence uprights are appropriately removed, ensuring that no uprights are cut at ground level but rather removed completely.						

5.6 Water Supply Management

Impact management outcome: Undertake responsible water usage.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All abstraction points or bore holes must be registered with the DWS and suitable water meters installed to ensure that the abstracted volumes are measured on a daily basis; – The Contractor must ensure the following: a. The vehicle abstracting water from a river does not enter or cross it and does not operate from within the river; b. No damage occurs to the river bed or banks and that						

the abstraction of water does not entail stream diversion activities; and c. All reasonable measures to limit pollution or sedimentation of the downstream watercourse are implemented. – Ensure water conservation is being practiced by: a. Minimising water use during cleaning of equipment; b. Undertaking regular audits of water systems; and c. Including a discussion on water usage and conservation during environmental awareness training. d. The use of grey water is encouraged.						

5.7 Storm and waste water management

Impact management outcome: Impacts to the environment caused by storm water and wastewater discharges during construction are avoided.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Runoff from the cement/ concrete batching areas must be strictly controlled, and contaminated water must be collected, stored and either treated or disposed of off-site, at a location approved by the project manager; – All spillage of oil onto concrete surfaces must be controlled by the use of an approved absorbent material and the used absorbent material disposed of at an appropriate waste disposal facility; – Natural storm water runoff not contaminated during the development and clean water can be discharged directly to watercourses and water bodies, subject to the Project Manager's approval and support by the ECO; – Water that has been contaminated with suspended solids, such as soils and silt, may be released into watercourses or water bodies only once all suspended solids have been removed from the water by settling out these solids in settlement ponds. The release of settled water back into the environment must be subject to the Project Manager's approval and support by the ECO.						

5.8 Solid and hazardous waste management

Impact management outcome: Waste is appropriately stored, handled and safely disposed of at a recognised waste facility.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All measures regarding waste management must be undertaken using an integrated waste management approach; – Sufficient, covered waste collection bins (scavenger and weatherproof) must be provided; – A suitably positioned and clearly demarcated waste collection site must be identified and provided; – The waste collection site must be maintained in a clean and orderly manner; – Waste must be segregated into separate bins and clearly marked for each waste type for recycling and safe disposal; – Staff must be trained in waste segregation; – Bins must be emptied regularly; – General waste produced onsite must be disposed of at registered waste disposal sites/ recycling company; – Hazardous waste must be disposed of at a registered waste disposal site; – Certificates of safe disposal for general, hazardous and recycled waste must be maintained.						

5.9 Protection of watercourses and estuaries

Impact management outcome: Pollution and contamination of the watercourse environment and or estuary erosion are prevented.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All watercourses must be protected from direct or indirect spills of pollutants such as solid waste, sewage, cement, oils, fuels, chemicals, aggregate tailings, wash and contaminated water or organic material resulting from the Contractor's activities; – In the event of a spill, prompt action must be taken to clear the polluted or affected areas; – Where possible, no development equipment must traverse any seasonal or permanent wetland – No return flow into the estuaries must be allowed and no disturbance of the Estuarine Functional Zone should occur; – Development of permanent watercourse or estuary crossing must only be undertaken where no alternative access to tower position is available; – There must not be any impact on the long term morphological dynamics of watercourses or estuaries; – Existing crossing points must be favored over the creation of new crossings (including temporary access) – When working in or near any watercourse or estuary, the following environmental controls and consideration must be taken: a) Water levels during the period of construction; No altering of the bed, banks, course or characteristics of a watercourse b) During the execution of the works, appropriate measures to prevent pollution and contamination of the						

riparian environment must be implemented e.g. including ensuring that construction equipment is well maintained; c) Where earthwork is being undertaken in close proximity to any watercourse, slopes must be stabilised using suitable materials, i.e. sandbags or geotextile fabric, to prevent sand and rock from entering the channel; and d) Appropriate rehabilitation and re-vegetation measures for the watercourse banks must be implemented timeously. In this regard, the banks should be appropriately and incrementally stabilised as soon as development allows.						

5.10 Vegetation clearing

Impact management outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
General: – Indigenous vegetation which does not interfere with the development must be left undisturbed; – Protected or endangered species may occur on or near the development site. Special care should be taken not to damage such species; – Search, rescue and replanting of all protected and endangered species likely to be damaged during project development must be identified by the relevant specialist and completed prior to any development or clearing; – Permits for removal must be obtained from the Department of Agriculture, Forestry and Fisheries prior to the cutting or clearing of the affected species, and they must be filed; – The Environmental Audit Report must confirm that all						

identified species have been rescued and replanted and that the location of replanting is compliant with conditions of approvals; – Trees felled due to construction must be documented and form part of the Environmental Audit Report; – Rivers and watercourses must be kept clear of felled trees, vegetation cuttings and debris; – Only a registered pest control operator may apply herbicides on a commercial basis and commercial application must be carried out under the supervision of a registered pest control operator, supervision of a registered pest control operator or is appropriately trained; – A daily register must be kept of all relevant details of herbicide usage; – No herbicides must be used in estuaries; – All protected species and sensitive vegetation not removed must be clearly marked and such areas fenced off in accordance to ***Section 5.3: Access restricted areas***. **Servitude:** – Vegetation that does not grow high enough to cause interference with overhead transmission and distribution infrastructures, or cause a fire hazard to any plantation, must not be cut or trimmed unless it is growing in the road access area, and then only at the discretion of the Project Manager; – Where clearing for access purposes is essential, the maximum width to be cleared within the servitude must be in accordance to distance as agreed between the land owner and the EA holder – Alien invasive vegetation must be removed according to a plan (in line with relevant municipal and provincial procedures, guidelines and recommendations) and disposed of at a recognised waste disposal facility; – Vegetation must be trimmed where it is likely to intrude on						

the minimum vegetation clearance distance (MVCD) or will intrude on this distance before the next scheduled clearance. MVCD is determined from SANS 10280; – Debris resulting from clearing and pruning must be disposed of at a recognised waste disposal facility, unless the landowners wish to retain the cut vegetation; – In the case of the development of new overhead transmission and distribution infrastructures, a one metre "trace-line" must be cut through the vegetation for stringing purposes only and no vehicle access must be cleared along the "trace-line". Alternative methods of stringing which limit impact to the environment must always be considered.						

5.11 Protection of fauna

Impact management outcome: Minimise disturbance to fauna.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– No interference with livestock must occur without the landowner's written consent and with the landowner or a person representing the landowner being present; – The breeding sites of raptors and other wild birds species must be taken into consideration during the planning of the development programme; – Breeding sites must be kept intact and disturbance to breeding birds must be avoided. Special care must be taken where nestlings or fledglings are present; – Nesting sites on existing parallel lines must documented; – Special recommendations of the avian specialist must be adhered to at all times to prevent unnecessary disturbance of birds;						

– Bird guards and diverters must be installed on the new line as per the recommendations of the specialist; – No poaching must be tolerated under any circumstances. All animal dens in close proximity to the works areas must be marked as Access restricted areas; – No deliberate or intentional killing of fauna is allowed; – In areas where snakes are abundant, snake deterrents to be deployed on the pylons to prevent snakes climbing up, being electrocuted and causing power outages; and – No Threatened or Protected species (ToPs) and/or protected fauna as listed according NEMBA (Act No. 10 of 2004) and relevant provincial ordinances may be removed and/or relocated without appropriate authorisations/permits.						

5.12 Protection of heritage resources

Impact management outcome: Minimise impact to heritage resources.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Identify, demarcate and prevent impact to all known sensitive heritage features on site in accordance with the No-Go procedure in ***Section 5.3: Access restricted areas***; – Carry out general monitoring of excavations for potential fossils, artefacts and material of heritage importance; – All work must cease immediately, if any human remains and/or other archaeological, palaeontological and historical material are uncovered. Such material, if exposed, must be reported to the nearest museum, archaeologist/ palaeontologist (or the South African Police Services), so that a systematic and professional investigation can be						

undertaken. Sufficient time must be allowed to remove/collect such material before development recommences.						

5.13 Safety of the public

Impact management outcome: All precautions are taken to nauthor the risk of injury, harm or complaints.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Identify fire hazards, demarcate and restrict public access to these areas as well as notify the local authority of any potential threats e.g. large brush stockpiles, fuels etc.; – All unattended open excavations must be adequately fenced or demarcated; – Adequate protective measures must be implemented to prevent nauthorized access to and climbing of partly constructed towers and protective scaffolding; – Ensure structures vulnerable to high winds are secured; – Maintain an incidents and complaints register in which all incidents or complaints involving the public are logged.						

5.14 Sanitation

Impact management outcome: Clean and well maintained toilet facilities are available to all staff in an effort to minimise the risk of disease and impact to the environment.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance

– Mobile chemical toilets are installed onsite if no other ablution facilities are available; – The use of ablution facilities and or mobile toilets must be used at all times and no indiscriminate use of the veld for the purposes of ablutions must be permitted under any circumstances; – Where mobile chemical toilets are required, the following must be ensured: a) Toilets are located no closer than 100 m to any watercourse or water body; b) Toilets are secured to the ground to prevent them from toppling due to wind or any other cause; c) No spillage occurs when the toilets are cleaned or emptied and the contents are managed in accordance with the EMPr; d) Toilets have an external closing mechanism and are closed and secured from the outside when not in use to prevent toilet paper from being blown out; e) Toilets are emptied before long weekends and workers holidays, and must be locked after working hours; f) Toilets are serviced regularly and the ECO must inspect toilets to ensure compliance to health standards; – A copy of the waste disposal certificates must be maintained.						

5.15 Prevention of disease

Impact Management outcome: All necessary precautions linked to the spread of disease are taken.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance

– Undertake environmentally-friendly pest control in the camp area; – Ensure that the workforce is sensitised to the effects of sexually transmitted diseases, especially HIV AIDS; – The Contractor must ensure that information posters on AIDS are displayed in the Contractor Camp area; – Information and education relating to sexually transmitted diseases to be made available to both construction workers and local community, where applicable; – Free condoms must be made available to all staff on site at central points; – Medical support must be made available; – Provide access to Voluntary HIV Testing and Counselling Services.						

5.16 Emergency procedures

Impact management outcome: Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Compile an Emergency Response Action Plan (ERAP) prior to the commencement of the proposed project; – The Emergency Plan must deal with accidents, potential spillages and fires in line with relevant legislation; – All staff must be made aware of emergency procedures as part of environmental awareness training; – The relevant local authority must be made aware of a fire as soon as it starts; – In the event of emergency necessary mitigation measures to contain the spill or leak must be implemented (see ***Hazardous Substances section 5.17***).						

5.17 Hazardous substances

Impact management outcome: Safe storage, handling, use and disposal of hazardous substances.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– The use and storage of hazardous substances to be minimised and non-hazardous and non-toxic alternatives substituted where possible; – All hazardous substances must be stored in suitable containers as defined in the Method Statement;						

– Containers must be clearly marked to indicate contents, quantities and safety requirements; – All storage areas must be bunded. The bunded area must be of sufficient capacity to contain a spill / leak from the stored containers; – Bunded areas to be suitably lined with a SABS approved liner; – An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and kept up to date on a continuous basis; – All hazardous chemicals that will be used on site must have Material Safety Data Sheets (MSDS); – All employees working with HCS must be trained in the safe use of the substance and according to the safety data sheet; – Employees handling hazardous substances / materials must be aware of the potential impacts and follow appropriate safety measures. Appropriate personal protective equipment must be made available; – The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowsers; – The tanks/ bowsers must be situated on a smooth impermeable surface (concrete) with a permanent bund. The impermeable lining must extend to the crest of the bund and the volume inside the bund must be 130% of the total capacity of all the storage tanks/ bowsers (110% statutory requirement plus an allowance for rainfall); – The floor of the bund must be sloped, draining to an oil separator; – Provision must be made for refueling at the storage area by protecting the soil with an impermeable groundcover. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained;						

– All empty externally dirty drums must be stored on a drip tray or within a bunded area; – No unauthorised access into the hazardous substances storage areas must be permitted; – No smoking must be allowed within the vicinity of the hazardous storage areas; – Adequate fire-fighting equipment must be made available at all hazardous storage areas; – Where refueling away from the dedicated refueling station is required, a mobile refueling unit must be used. Appropriate ground protection such as drip trays must be used; – An appropriately sized spill kit kept onsite relevant to the scale of the activity/s involving the use of hazardous substance must be available at all times; – The responsible operator must have the required training to make use of the spill kit in emergency situations; – An appropriate number of spill kits must be available and must be located in all areas where activities are being undertaken; – In the event of a spill, contaminated soil must be collected in containers and stored in a central location and disposed of according to the National Environmental Management: Waste Act 59 of 2008. Refer to ***Section 5.7*** for procedures concerning ***storm and waste water management*** and ***5.8*** for ***solid and hazardous waste management.***						

5.18 Workshop, equipment maintenance and storage

Impact management outcome: Soil, surface water and groundwater contamination is minimised.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance

– Where possible and practical all maintenance of vehicles and equipment must take place in the workshop area; – During servicing of vehicles or equipment, especially where emergency repairs are effected outside the workshop area, a suitable drip tray must be used to prevent spills onto the soil. The relevant local authority must be made aware of a fire as soon as it starts; – Leaking equipment must be repaired immediately or be removed from site to facilitate repair; – Workshop areas must be monitored for oil and fuel spills; – Appropriately sized spill kit kept onsite relevant to the scale of the activity taking place must be available; – The workshop area must have a bunded concrete slab that is sloped to facilitate runoff into a collection sump or suitable oil / water separator where maintenance work on vehicles and equipment can be performed; – Water drainage from the workshop must be contained and managed in accordance ***Section 5.7: storm and waste water management***.						

5.19 Batching plants

Impact management outcome: Minimise spillages and contamination of soil, surface water and groundwater.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Concrete mixing must be carried out on an impermeable surface; – Batching plants areas must be fitted with a containment facility for the collection of cement laden water. – Dirty water from the batching plant must be contained to prevent soil and groundwater contamination – Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains; – A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted; – Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licenced disposal facility; – Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site; – Sand and aggregates containing cement must be kept damp to prevent the generation of dust (Refer to ***Section 5.20: Dust emissions***) – Any excess sand, stone and cement must be removed or reused from site on completion of construction period and disposed at a registered disposal facility; – Temporary fencing must be erected around batching plants in accordance with ***Section 5.5: Fencing and gate installation***.						

5.20 Dust emissions

Impact management outcome: Dust prevention measures are applied to minimise the generation of dust.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO; – Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces must be re- vegetated or stabilised as soon as is practically possible; – Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present; – During high wind conditions, the ECO must evaluate the situation and make recommendations as to whether dust-damping measures are adequate, or whether working will cease altogether until the wind speed drops to an acceptable level; – Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind; – Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO; – Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas; – Straw stabilisation must be applied at a rate of one bale/10						

m² and harrowed into the top 100 mm of top material, for all completed earthworks; – For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread of dust.						

5.21 Blasting

Impact management outcome: Impact to the environment is minimised through a safe blasting practice.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Any blasting activity must be conducted by a suitably licensed blasting contractor; and – Notification of surrounding landowners, emergency services site personnel of blasting activity 24 hours prior to such activity taking place on Site.						

5.22 Noise

Impact Management outcome: Unnecessary noise is prevented by ensuring that noise from construction activities is mitigated.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– The Contractor must keep noise level within acceptable limits, Restrict the use of sound amplification equipment for communication and emergency only; – All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained; – Any complaints received by the Contractor regarding noise						

must be recorded and communicated. Where possible or applicable, provide transport to and from the site on a daily basis for construction workers; – Develop a Code of Conduct for the construction phase in terms of behaviour of construction staff.Operating hours as determined by the environmental authorisation are adhered to during the development phase. Where not defined, it must be ensured that development activities must still meet the impact management outcome related to noise management.						

5.23 Fire prevention

Impact management outcome: Prevention of uncontrollable fires.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Designate smoking areas where the fire hazard could be regarded as insignificant; – Firefighting equipment must be available on all vehicles located on site; – The local Fire Protection Agency (FPA) must be informed of construction activities; – Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site; – Two way swop of contact details between ECO and FPA.						

5.24 Stockpiling and stockpile areas

Impact management outcome: Erosion and sedimentation as a result of stockpiling are reduced.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All material that is excavated during the project development phase (either during piling (if required) or earthworks) must be stored appropriately on site in order to inimize impacts to watercourses, watercourses and water bodies; – All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods; – Topsoil stockpiles must not exceed 2 m in height; – During periods of strong winds and heavy rain, the stockpiles must be covered with appropriate material (e.g. cloth, tarpaulin etc.); – Where possible, sandbags (or similar) must be placed at the bases of the stockpiled material in order to prevent erosion of the material.						

5.25 Finalising tower positions

Impact management outcome: No environmental degradation occurs as a result of the survey and pegging operations.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– No vegetation clearing must occur during survey and pegging operations; – No new access roads must be developed to facilitate access for survey and pegging purposes; – Project manager, botanical specialist and contractor to agree on final tower positions based on survey within assessed and approved areas; – The surveyor is to demarcate (peg) access roads/tracks in consultation with ECO. No deviations will be allowed without the prior written consent from the ECO.						

5.26 Excavation and Installation of foundations

Impact management outcome: No environmental degradation occurs as a result of excavation or installation of foundations.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All excess spoil generated during foundation excavation must be disposed of in an appropriate manner and at a ecognized disposal site, if not used for backfilling purposes; – Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes; – Management of equipment for excavation purposes must be undertaken in accordance with ***Section 5.18: Workshop***						

equipment maintenance and storage; and – Hazardous substances spills from equipment must be managed in accordance with ***Section 5.17: Hazardous substances***. – Batching of cement to be undertaken in accordance with **Section *5.19 : Batching plants***; – Residual cement must be disposed of in accordance with **Section *5.8: Solid and hazardous waste management***.						

5.27 Assembly and erecting towers

Impact management outcome: No environmental degradation occurs as a result of assembly and erecting of towers.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Prior to erection, assembled towers and tower sections must be stored on elevated surface (suggest wooden blocks) to minimise damage to the underlying vegetation; – In sensitive areas, tower assembly must take place off-site or away from sensitive positions; – The crane used for tower assembly must be operated in a manner which minimises impact to the environment; – The number of crane trips to each site must be minimised; – Wheeled cranes must be utilised in preference to tracked cranes; – Consideration must be given to erecting towers by helicopter or by hand where it is warranted to limit the extent of environmental impact; – Access to tower positions to be undertaken in accordance with access requirements in specified in Section 8.4: Access Roads; – Vegetation clearance to be undertaken in accordance						

with general vegetation clearance requirements specified in Section 8.10: Vegetation clearing; – No levelling at tower sites must be permitted unless approved by the Development Project Manager or Developer Site Supervisor; – Topsoil must be removed separately from subsoil material and stored for later use during rehabilitation of such tower sites; – Topsoil must be stored in heaps not higher than 1m to prevent destruction of the seed bank within the topsoil; – Excavated slopes must be no greater that 1:3, but where this is unavoidable, appropriate measures must be undertaken to stabilise the slopes; – Fly rock from blasting activity must be minimised and any pieces greater than 150 mm falling beyond the Working Area, must be collected and removed; – Only existing disturbed areas are utilised as spoil areas; – Drainage is provided to control groundwater exit gradient with the spill areas such that migration of fines is kept to a minimum; – Surface water runoff is appropriately channeled through or around spoil areas; – During backfilling operations, care must be taken not to dump the topsoil at the bottom of the foundation and then put spoil on top of that; – The surface of the spoil is appropriately rehabilitated in accordance with the requirements specified in Section 5.29: Landscaping and rehabilitation; – The retained topsoil must be spread evenly over areas to be rehabilitated and suitably compacted to effect re-vegetation of such areas to prevent erosion as soon as construction activities on the site is complete. Spreading of topsoil must not be undertaken at the beginning of the dry season.						

5.28 Stringing

Impact management outcome: No environmental degradation occurs as a result of stringing.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Where possible, previously disturbed areas must be used for the siting of winch and tensioner stations. In all other instances, the siting of the winch and tensioner must avoid Access restricted areas and other sensitive areas; – The winch and tensioner station must be equipped with drip trays in order to contain any fuel, hydraulic fuel or oil spills and leaks; – Refueling of the winch and tensioner stations must be undertaken in accordance with Section 5.17: Hazardous substances; – In the case of the development of overhead transmission and distribution infrastructure, a one metre "trace-line" may be cut through the vegetation for stringing purposes only and no vehicle access must be cleared along "trace-lines". Vegetation clearing must be undertaken by hand, using chainsaws and hand held implements, with vegetation being cut off at ground level. No tracked or wheeled mechanised equipment must be used; – Alternative methods of stringing which limit impact to the environment must always be considered e.g. by hand or by using a helicopter; – Where the stringing operation crosses a public or private road or railway line, the necessary scaffolding/ protection measures must be installed to facilitate access. If, for any reason, such access has to be closed for any period(s)						

during development, the persons affected must be given reasonable notice, in writing; – No services (electrical distribution lines, telephone lines, roads, railways lines, pipelines fences etc.) must be damaged because of stringing operations. Where disruption to services is unavoidable, persons affected must be given reasonable notice, in writing; – Where stringing operations cross cultivated land, damage to crops is restricted to the minimum required to conduct stringing operations, and reasonable notice (10 work days minimum), in writing, must be provided to the landowner; – Necessary scaffolding protection measures must be installed to prevent damage to the structures supporting certain high value agricultural areas such as vineyards, orchards, nurseries.						

5.29 Socio-economic

Impact management outcome: Socio-economic development is enhanced.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Develop and implement communication strategies to facilitate public participation; – Develop and implement a collaborative and constructive approach to conflict resolution as part of the external stakeholder engagement process; – Sustain continuous communication and liaison with neighboring owners and residents – Create work and training opportunities for local stakeholders; and – Where feasible, no workers, with the exception of security						

personnel, must be permitted to stay over-night on the site. This would reduce the risk to local farmers.						

5.30 Temporary closure of site

Impact management outcome: Minimise the risk of environmental impact during periods of site closure greater than five days.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Bunds must be emptied (where applicable) and need to be undertaken in accordance with the impact management actions included in ***sections 5.17: management of hazardous substances*** and ***5.18 workshop, equipment maintenance and storage***; – Hazardous storage areas must be well ventilated; – Fire extinguishers must be serviced and accessible. Service records to be filed and audited at last service; – Emergency and contact details displayed must be displayed; – Security personnel must be briefed and have the facilities to contact or be contacted by relevant management and emergency personnel; – Night hazards such as reflectors, lighting, traffic signage etc. must have been checked; – Fire hazards identified and the local authority must have been notified of any potential threats e.g. large brush stockpiles, fuels etc.; – Structures vulnerable to high winds must be secured; – Wind and dust mitigation must be implemented; – Cement and materials stores must have been secured; – Toilets must have been emptied and secured;						

– Refuse bins must have been emptied and secured; – Drip trays must have been emptied and secured.						

5.30 Landscaping and rehabilitation

Impact management outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All areas disturbed by construction activities must be subject to landscaping and rehabilitation; All spoil and waste must be disposed to a registered waste site and certificates of disposal provided; – All slopes must be assessed for contouring, and to contour only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983 – All slopes must be assessed for terracing, and to terrace only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983; – Berms that have been created must have a slope of 1:4 and be replanted with indigenous species and grasses that approximates the original condition; – Where new access roads have crossed cultivated farmlands, that lands must be rehabilitated by ripping which must be agreed to by the holder of the EA and the landowners; – Rehabilitation of tower sites and access roads outside of farmland; – Indigenous species must be used for with species and/grasses to where it compliments or approximates the original condition; – Stockpiled topsoil must be used for rehabilitation (refer to Section ***5.24: Stockpiling and stockpiled areas***);						

– Stockpiled topsoil must be evenly spread so as to facilitate seeding and minimise loss of soil due to erosion; – Before placing topsoil, all visible weeds from the placement area and from the topsoil must be removed; – Subsoil must be ripped before topsoil is placed; – The rehabilitation must be timed so that rehabilitation can take place at the optimal time for vegetation establishment; – Where impacted through construction related activity, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled ; – Sloped areas stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly; – Spoil can be used for backfilling or landscaping as long as it is covered by a minimum of 150 mm of topsoil. – Where required, re-vegetation including hydro-seeding can be enhanced using a vegetation seed mixture as described below. A mixture of seed can be used provided the mixture is carefully selected to ensure the following: a) Annual and perennial plants are chosen; b) Pioneer species are included; c) Species chosen must be indigenous to the area with the seeds used coming from the area; d) Root systems must have a binding effect on the soil; e) The final product must not cause an ecological imbalance in the area						

ACCESS TO THE GENERIC EMPr

Once completed and signed, to allow the public access to the generic EMPr, the holder of the EA must make the EMPr available to the public in accordance with the requirements of regulation 26(h) of the EIA Regulations.

PART B: SECTION 2

7 SITE SPECIFIC INFORMATION AND DECLARATION

7.1 Sub-section 1: contact details and description of the project

7.1.1 Details of the applicant:

Igolide Wind (Pty) Ltd is the project proponent (Applicant) with regards to this application for the construction and operation of the Igolide Wind Energy Facility(WEF).

Proponent:	Igolide Wind (Pty) Ltd
Contact Person:	Mercia Grimbeek/Mmakoena Mmola
Postal Address	Suite 104, Albion Springs, 183 Main Road, Rondebosch, Cape Town, South Africa 7700
Telephone:	071 752 8033
Email:	Mercia.Grimbeek@enertrag.com / mmakoena.mmola@enertrag.com

7.1.2 Details and expertise of the EAP:

WSP was appointed in the role of Independent EAP to undertake the S&EIA process for the proposed project. The CV of the EAP is available in Appendix A of the Site Specific EMPr. The EAP declaration of interest and undertaking is included in Appendix B of the Site Specific EMPr.

EAP	WSP Group Africa (PTY) Ltd
Company Registration:	1999/008928/07
Contact Person:	Ashlea Strong
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EAPASA Registration Number:	EAPASA (2019/1005)

7.1.3 Project name: **Igolide Wind Energy Facility**

7.1.4 Description of the project:

The proposed Igolide Wind Energy Facility, with an installed capacity of up to 100MW, including associated and grid connection infrastructure, is proposed to be developed near Fochville in the Gauteng Province.

The proposed Project will be developed within a project area of approximately 680 hectares (ha). Within this project area, the extent of the Project footprint will be approximately 64ha, including linear infrastructure (i.e., roads).

Project infrastructure:

The proposed project will comprise the following key components:

Igolide WEF	Description
Capacity:	Up to 100MW
Total Site extent	680ha
Project Footprint (Buildable area)	64ha (including linear infrastructure, i.e., roads)
No. of turbines:	10
Turbine hub height:	Up to 200m
Rotor Diameter:	Up to 200m
Tip Height :	Up to 300m
Foundation:	Approximately 25m diameter x 3m. Volume to be excavated will be approximately 2 200m^3, in sandy soils due to access requirements and safe slope stability requirements.
Turbine Hardstand:	Hardstand does not require concrete. Area required will be approximately 1 ha per turbine.
Tower Type	Steel or concrete towers can be utilised at the site. Alternatively, the towers can be of a hybrid nature, comprising concrete towers and top steel sections.
On-site IPP substation and battery energy storage system (BESS):	The total footprint for the on-site substation, including the BESS, will be up to 2.5ha in extent. The on-site IPP portion substation will consist of a high voltage substation yard to allow for multiple 132kV feeder bays and transformers, control building, telecommunication infrastructure, and other substation components, as required. A 500m buffer around the on-site IPP substation has been assessed to ensure flexibility in routing the powerline. The BESS storage capacity will be up to 400 megawatt-hour (MWh) . 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 as 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. The BESS components will arrive on site pre-assembled.
Grid (to form part of a separate application for EA)	A single or double circuit 132kV overhead powerline and 132kV switching station (with a footprint of approximately 1.5ha, to be located adjacent to the on-site IPP substation) to feed the electricity generated by the proposed WEF into the national grid. A corridor of up to 250m in width (125m on either side of the centre line) has been identified for the placement of the up to 132kV single or double circuit power line to allow flexibility in the design of the final powerline route, and for the avoidance of sensitive environmental features (where possible).
Cables:	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, connecting the turbines to the on-site IPP substation.
Operations and Maintenance (O&M) building and storerooms:	The Operations and Maintenance ("O&M") building footprint will be located near the on-site substation. Typical areas include: • Operations building of 200m^2 • Workshop and stores area of ~300m^2 • Refuse area for temporary waste storage and conservancy tanks to service ablution facility. The total combined area of the buildings will not exceed 5 000m^2.
Construction camps:	The construction camp will house the contractor offices, ablution facilities, mess area, etc., and will have a footprint of approximately 1ha. The construction camp will be demolished after commercial operations date and the area rehabilitated.
Temporary laydown or staging areas:	The laydown area will be used for the storage of equipment or components that will be incorporated into the facility (such as electrical cables) as well as non-facility related equipment and components such as shipping frames, concrete shuttering, etc. The laydown area will also be used for the storage (and filling of vehicles) of diesel fuel. The laydown area will have a footprint of up to 2ha, which could increase to 3ha for concrete towers, should they be required. The laydown area will be demolished after commercial operations date and the area rehabilitated.
Cement Batching Plant (temporary):	The cement batching plant will be used to mix and blend cement, water, sand and aggregates to form quality concrete to be used for foundations. The cement batching plant will have a footprint of approximately 1ha.
Access and Internal Roads:	Access and internal roads will have a width of 8 - 10m, increasing up to 20m for turning circle/bypass areas to allow for larger component transport. The access and internal roads will be placed within a corridor of up to 20m width to accommodate cable trenches, stormwater channels and turning circle/bypass areas of up to 20m. Existing access roads will be used where possible to minimise impact. Where required, the width of the existing roads will be widened to ensure the passage of vehicles.
Supporting Infrastructure:	• Fencing; • Lighting;

	• Lightning protection; • Telecommunication infrastructure; • Stormwater channels; • Water pipelines; • Offices; • Operational and control centre; • Operations and maintenance area / warehouse / workshop; • Ablution facilities; • Gatehouse; • Security building; • Visitor's centre; and • Substation building.

7.1.5 Project location:

The proposed Igolide WEF is located near Fochville, within the within the Merafong City Local Municipality (MCLM) in the Gauteng Province.

The details of the properties associated with the proposed Igolide WEF, including the 21-digit Surveyor General (SG) codes for the cadastral land parcels are outlined in Table 1. The co-ordinates of the cadastral land parcels are included in Table 2.

Table 2– Igolide WEF Affected Farm Portions

Farm Name	21 Digit Surveyor General Code of Each Cadastral Land Parcel
Portion 14 of Farm Kraalkop 147IQ	T0IQ00000000014700014
Portion 20 of Farm Kraalkop 147IQ	T0IQ00000000014700020
Portion RE/22 of Farm Kraalkop 147IQ	T0IQ00000000014700022
Portion 8 of Farm Leeuwpoort 356IQ	T0IQ00000000035600008
Portion 57 of Farm Leeuwpoort 356IQ	T0IQ00000000035600057
Portion 65 of Farm Leeuwpoort 356IQ	T0IQ00000000035600065
Portion 66 of Farm Leeuwpoort 356IQ	T0IQ00000000035600066

Table 3 – Coordinate Points of the Cadastral Land Parcel

Point	Longitude	Latitude
A	27° 30' 50.047" E	26° 26' 5.747" S
B	27° 31' 32.289" E	26° 26' 13.501" S
C	27° 31' 39.568" E	26° 26' 28.680" S
D	27° 32' 20.572" E	26° 26' 32.606" S
E	27° 32' 36.103" E	26° 26' 44.983" S
F	27° 32' 53.684" E	26° 26' 47.071" S
G	27° 32' 53.035" E	26° 26' 53.296" S
H	27° 32' 37.320" E	26° 26' 54.822" S
I	27° 32' 28.738" E	26° 26' 58.974" S
J	27° 32' 22.374" E	26° 26' 52.723" S
K	27° 31' 14.239" E	26° 27' 10.363" S
L	27° 31' 21.840" E	26° 27' 35.790" S
M	27° 31' 4.426" E	26° 27' 45.540" S
N	27° 30' 25.098" E	26° 27' 40.909" S
O	27° 30' 7.192" E	26° 28' 3.540" S
P	27° 29' 45.366" E	26° 28' 9.938" S
Q	27° 29' 50.180" E	26° 27' 56.916" S
R	27° 29' 55.494" E	26° 27' 55.937" S
S	27° 30' 2.002" E	26° 27' 50.516" S

Point	Longitude	Latitude
T	27° 30' 2.742" E	26° 27' 42.073" S
U	27° 30' 11.233" E	26° 27' 25.277" S
V	27° 30' 11.509" E	26° 27' 17.954" S
W	27° 30' 17.013" E	26° 27' 17.823" S
X	27° 30' 15.705" E	26° 27' 9.177" S
Y	27° 29' 57.988" E	26° 27' 10.816" S
Z	27° 30' 2.347" E	26° 26' 53.984" S
AA	27° 30' 11.655" E	26° 26' 51.948" S
BB	27° 30' 26.639" E	26° 26' 55.606" S
CC	27° 30' 54.493" E	26° 26' 52.767" S
DD	27° 30' 44.013" E	26° 26' 25.541" S
EE	27° 30' 56.019" E	26° 26' 22.193" S

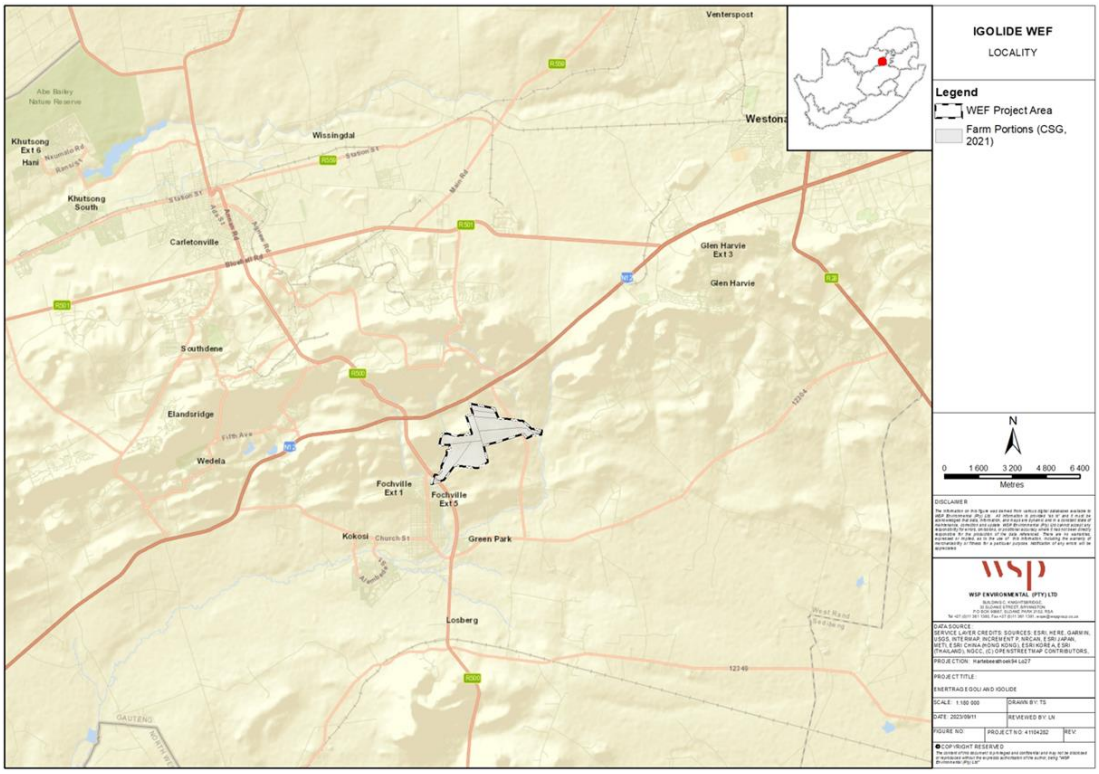

Figure 1: Regional locality map of Igolide WEF project area

7.16 Preliminary technical specification of the overhead transmission and distribution:

Refer to Section 2 of the site-specific EMPr

The Igolide WEF will include an 33kV underground cabling, anon-site IPP substation, BESS and single or double circuit 132kV Overhead Powerline.

7.2 Sub-section 2: Development footprint site map

This sub-section must include a map of the site sensitivity overlaid with the preliminary infrastructure layout. The sensitivity map must be prepared from the national web based environmental screening tool, when available for compulsory use at: https://screening.environment.gov.za/screeningtool. The sensitivity map shall identify the nature of each sensitive feature e.g. raptor nest, threatened plant species, archaeological

site, etc. Sensitivity maps shall identify features both within the planned working area and any known sensitive features in the surrounding landscape. The overhead transmission and distribution profile shall be illustrated at an appropriate resolution to enable fine scale interrogation. It is recommended that <20 km of overhead transmission and distribution length is illustrated per page in A3 landscape format. Where considered appropriate, photographs of sensitive features in the context of tower positions shall be used.

The map provided below has been compiled based on verified sensitivities through specialist studies, and relates to the Igolide WEF, which the 33kV cabling connecting the turbines to the on-site IPP substation is associated with.

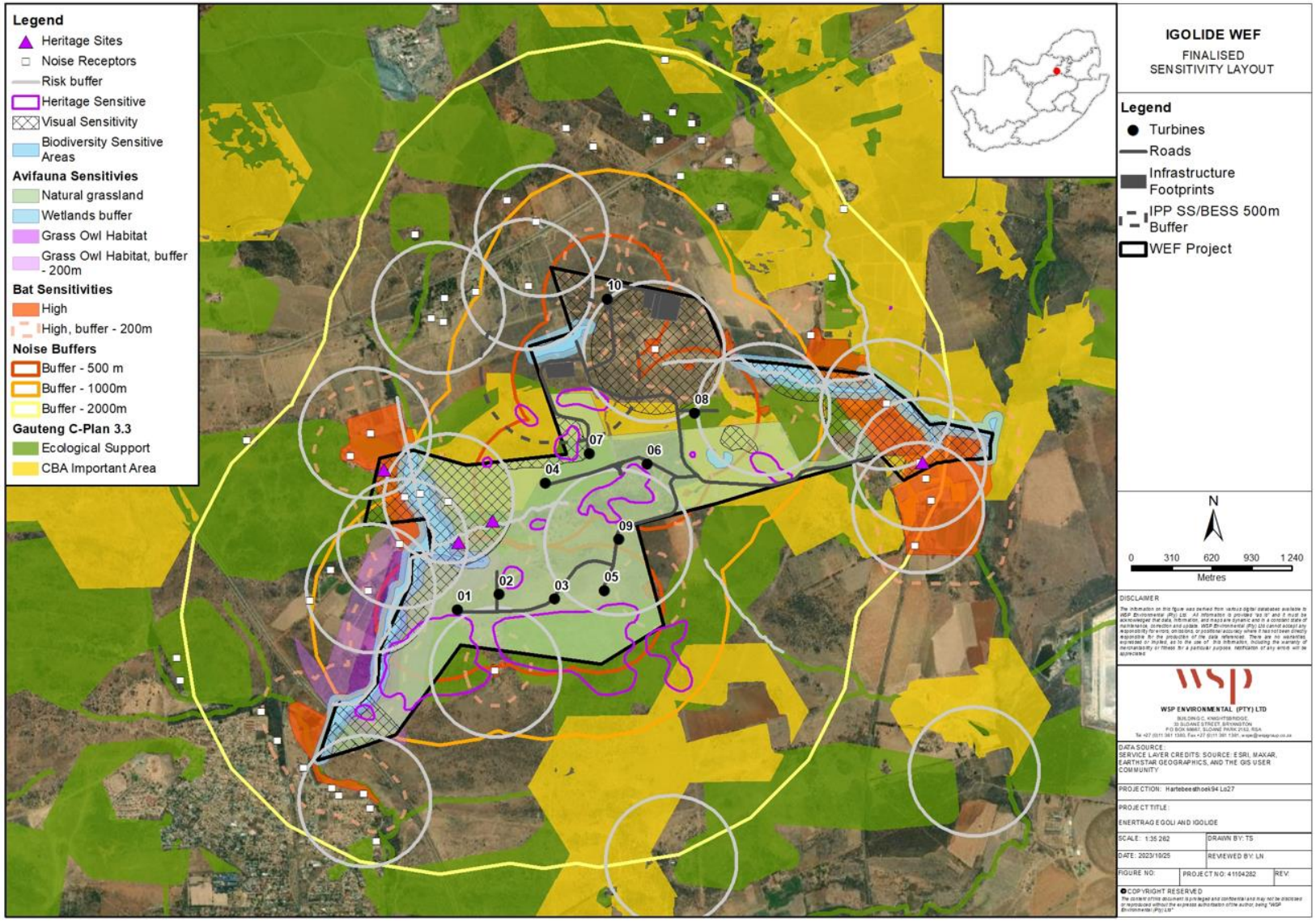

Figure 2: Igolide Final Layout Sensitivity map

Sub-section 3: Declaration

The proponent/applicant or holder of the EA affirms that he/she will abide and comply with the prescribed impact management outcomes and impact management actions as stipulated in part B: section 1 of the generic EMPr and have the understanding that the impact management outcomes and impact management actions are legally binding. The proponent/applicant or holder of the EA affirms that he/she will provide written notice to the CA 14 days prior to the date on which the activity will commence of commencement of construction to facilitate compliance inspections.

Signature to be included with the Final Report

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Signature Proponent/applicant/ holder of EA Date:

7.3 Sub-section 4: amendments to site specific information (Part B; section 2)

Should the EA be transferred to a new holder, Part B: Section 2 must be completed by the new holder and submitted with the application for an amendment of the EA in terms of Regulations 29 or 31 of the EIA Regulations, whichever applies. The information submitted for an amendment to an environmental authorisation will be considered to be incomplete should a signed copy of Part B: Section 2 not be submitted. Once approved, Part B: Section 2 forms part of the EMPr for the development and the EMPr becomes legally binding to the new EA holder.

PART C

8 SITE SPECIFIC ENVIRONMENTAL ATTRIBUTES

If any specific environmental sensitivities/attributes are present on the site which require more specific impact management outcomes and impact management actions, not included in the pre-approved generic EMPr template, to manage impacts, those impact management outcomes and actions must be included in this section. These specific management controls must be referenced spatially, and must include impact management outcomes and impact management actions. The management controls including impact management outcomes and impact management actions must be presented in the format of the pre-approved generic EMPr template. This applies only to additional impact management outcomes and impact management actions that are necessary.

If Part C is applicable to the development as authorised in the EA, it is required to be submitted to the CA together with the BAR or EIAR, for consideration of, and decision on, the application for EA. The information in this section must be prepared by an EAP and the name and expertise of the EAP, including the curriculum vitae are to be included. Once approved, Part C forms part of the EMPr for the site and is legally binding.

This section will **not be required** should the site contain no specific environmental sensitivities or attributes.

The overall site contain environmental sensitivities. The site specific mitigation measures for these attributes are included in Section 8 * of the Site Specific EMPr, and repeated again below.

The Sensitivity Map is indicated in Figure 3 below.

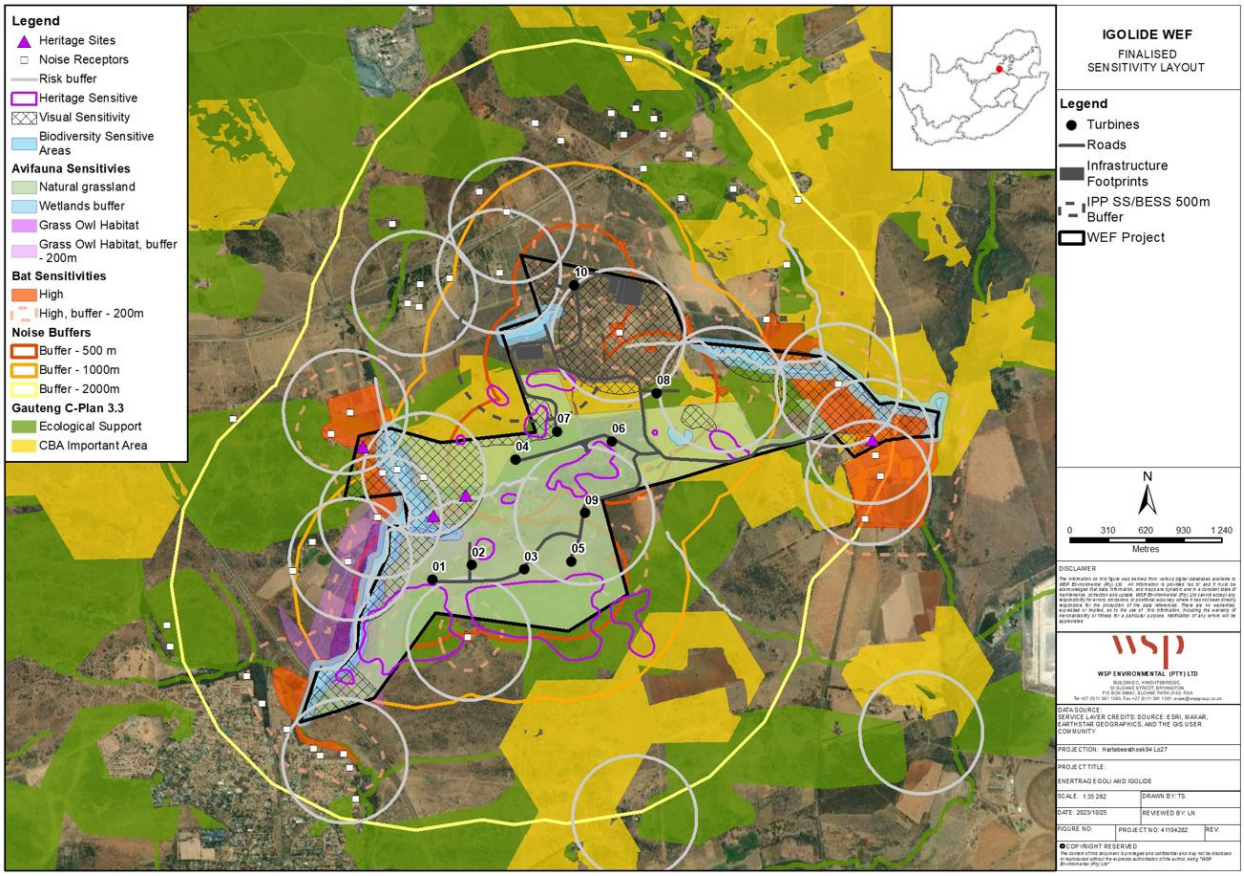

Figure 3: Igolide Final Layout Sensitivity Map

APPENDIX 1: METHOD STATEMENTS

To be prepared by the contractor prior to commencement of the activity. The method statements are **not required** to be submitted to the CA.

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