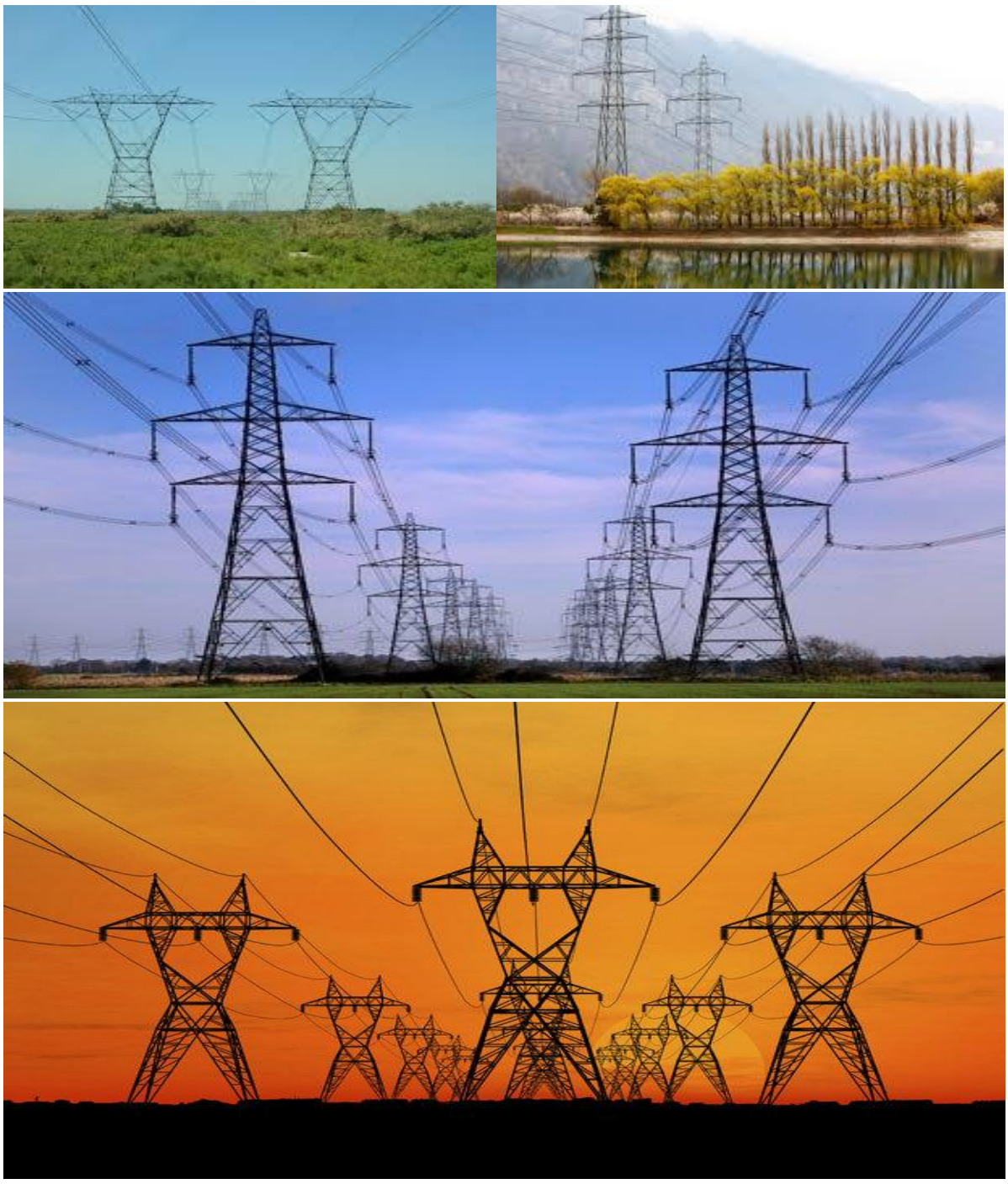
APPENDIX 1

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 EMPr template	Contains generally accepted impact 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

Part	Section	Heading	Content
			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. 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.

Part	Section	Heading	Content
			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

Responsible Person (s)	Role and Responsibilities
	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. <u>Responsibilities</u> - 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)	<u>Role</u> 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.

Responsible Person (s)	Role and Responsibilities
	Responsibilities The responsibilities of the ECO will include the following: - Be aware of the findings and conclusions of all EA related to the development; - 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 performing the onsite activities as per their contract with the Project Developer. The contractors are required, where

Responsible Person (s)	Role and Responsibilities
	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. 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 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;	**Holder of the EA / EPR Contractor**	**ESA to induct Staff**	**Anytime new staff begin duties**	**EPC contractor**	**Anytime new staff begin duties**	**Attendance Register / Monthly Environmental Control Report.**

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.	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by Engineer and ECO**	**Prior to commencement of construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

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.	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by Engineer and ECO**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

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.	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by Engineer and ECO**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

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	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by Engineer and ECO**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

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.	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by Engineer and ECO**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**	

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;	**EPC Contractor**	**Actions outlined in this section and submission of a method**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

– 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.		**statement for approval by Engineer and 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;	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

– 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.		**Engineer and ECO**				

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;	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

– 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.		**Engineer and ECO**				

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;	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by Engineer and ECO**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

– 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;	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by Engineer and ECO**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

– 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	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by Engineer and ECO**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

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.	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by Engineer and ECO**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

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;	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by Engineer and ECO**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

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.	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by Engineer and ECO**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

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***).	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by Engineer and ECO**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

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);	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by Engineer and ECO**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

– 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***.	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by Engineer and ECO**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

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;	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by Engineer and ECO**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

– 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;	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by Engineer and ECO**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

– 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.	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by Engineer and ECO**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

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.	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by Engineer and ECO**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

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.	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by Engineer and ECO**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

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 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.	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by Engineer and ECO**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

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;	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

– 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.		**Engineer and 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 recognised 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***.	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by Engineer and ECO**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

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;	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by Engineer and ECO**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

– 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;	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by Engineer and ECO**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

– 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;	**EPC Contractor**	**Actions outlined in this section and submission**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environment**

– 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.		**of a method statement for approval by Engineer and ECO**				**al control reports**

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;	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by Engineer and ECO**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

– 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.						

5.31 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;	**EPC Contractor**	**Actions outlined in this section and submission of a method statement for approval by**	**Throughout construction**	**ECO / ESA**	**Daily**	**Monthly Environmental control reports**

– 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.		**Engineer and ECO**				

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:

Name of applicant: Bethel Solar PV (Pty) Ltd

Tel No: + 27 (21) 418 2596

Postal Address: 21st Floor, 5 Buitengracht Street
Portside
Cape Town, 8001

Physical Address: 21st Floor, 5 Buitengracht Street
Portside
Cape Town, 8001

7.1.2 Details and expertise of the EAP:

Name of EAP: Dale Holder (Cape Environmental Assessment Practitioners)

Tel No: 044 8740365

E-mail address: dale@cape-eaprac.co.za

Expertise of the EAP Ndip NatCon EAPASA Registered EAP 2019/301

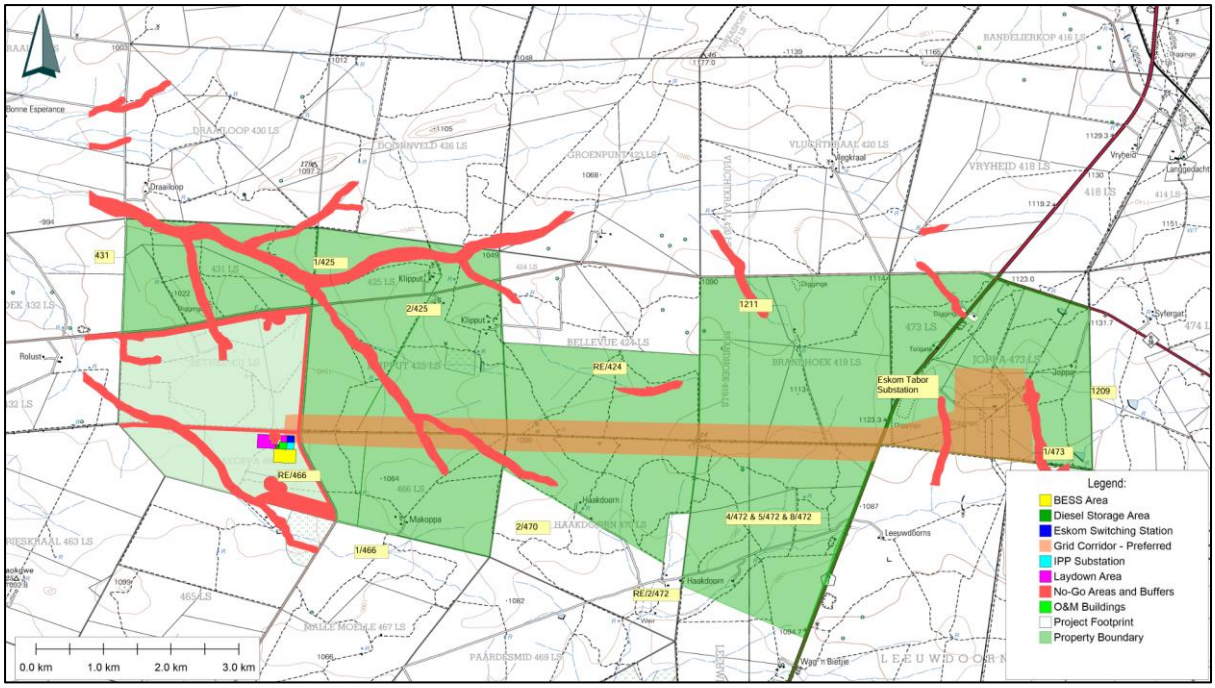
7.1.3 **Project name:** Bethel Solar PV Facility and Associated Infrastructure

This EMPr must be read in conjunction with the overarching EMP'r for the larger project

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.



7.3 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 ~~Proponent~~/applicant/~~holder~~ of EA on behalf of Date: 25/09/2025

7.4 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.

Impact / Aspect	Mitigation / Management Action
Construction phase Terrestrial biodiversity impacts, including: - Loss of Makhado Sweet Bushveld and associated plant species - Loss of Secondary Vegetation and associated plant species - Loss of individuals of protected plant species - Fragmentation of Vegetation and Disruption of Ecosystem Processes - Introduction and Spread of Weeds and Alien Plant Species - Loss and transformation of natural habitat within the Vhembe Biosphere Reserve - Loss of Faunal Habitat - Loss of Faunal SCC - Disturbance to Faunal Species and their Livelihood due to Project Related Activities - Mortality of Faunal Species due to Earthworks, Roadkill and Persecution	- Clearly demarcate the approved development footprint (including the SEF, access roads, laydown areas, and associated infrastructure) using visible markers such as danger tape or stakes. Construction activities must remain strictly within these boundaries, and no-go zones must be enforced for construction staff, vehicles, and equipment to protect surrounding sensitive or intact areas. - Strip and stockpile topsoil (to a depth of 20 cm, where feasible) from disturbed areas. Store this soil in a designated low-sensitivity area. The stockpile should be stabilised using shade cloth, hessian sheeting, a tarpaulin, or other suitable erosion-control material to prevent wind and water erosion. The stockpiled soil must be used for post-construction rehabilitation. - Rehabilitate all temporary construction areas (e.g., widened road verges) using locally indigenous species. Only indigenous species must be used in all rehabilitation efforts. - Laydown areas must be sited within the demarcated development footprint and may not encroach on surrounding natural vegetation. - Open fires must be strictly prohibited on-site during construction to prevent the risk of wildfires. - Develop and implement an Alien Invasive Plant Management Plan or Method Statement that includes regular site inspections, early detection, rapid response protocols, and manual or chemical control methods. Areas disturbed during construction must be monitored regularly and cleared of invasive species promptly. - Implement appropriate erosion control measures such as berms, fibre mats, or brush packing on disturbed soils to prevent erosion and facilitate vegetation recovery. - Establish a vegetation monitoring programme to assess recovery success of rehabilitation and restoration post construction and identify the need for further intervention. - Prohibit the collection or removal of plant material by any site personnel (other than the vegetation clearance required for the project footprint). Conduct regular spot checks to ensure compliance with this requirement. - Provide site-specific environmental training to all construction personnel, focusing on the ecological sensitivity of the bushveld and associated protection and mitigation measures. - Ensure strict enforcement and protection of the buffer zones around riparian areas as established by the aquatic specialist to maintain their function as ecological corridors. - Obtain a Protected Species Removal Permit from the Department of Forestry, Fisheries and the Environment (DFFE) and Limpopo Department of Economic Development, Environment and Tourism (LEDET) prior to removing any protected trees. - Clearly demarcate and avoid individuals of protected species where possible. - Relocate viable individuals of smaller species (Boscia foetida, young Sclerocarya birrea, etc.) to nearby suitable habitat prior to clearing. - Incorporate some protected species into rehabilitation/landscaping where appropriate. - Educate construction staff on protected species and no-go areas. - Avoid individuals of Adansonia digitata (Baobab) around the Makoppa Lodge. - Confine all construction and associated activities strictly to the approved development footprint to prevent unnecessary loss of additional vegetation. - Stabilise and revegetate disturbed areas not required for permanent infrastructure using fast-growing, locally indigenous plant species. - The site must be checked regularly for the presence of alien invasive species and weeds. When alien invasive species are found, immediate action must be taken to remove them. - Alien Invasive Plant Species and Weeds must be disposed on in line with the recommendations outlined in the Working for Water Programme.

Impact / Aspect	Mitigation / Management Action

	- Any equipment brought onto site must be clean to ensure no transfer or introduction of seeds.
	- No exotic species are permitted to be planted on site. Only indigenous plant species can be used for rehabilitation/landscaping.
	- The ECO must create a list with accompanying photographs of possible alien invasive species that could occur on site prior to construction. This photo guide must be used to determine if any alien invasive species are present.
	- An alien invasive method statement must be incorporated into the EMPr.
	- Focus rehabilitation efforts on restoring general vegetation structure and cover using hardy, locally appropriate secondary grassland species, rather than restoring exact pre-clearance diversity.
	- All construction and construction related activities (including parking of vehicles and machinery) must remain within the approved project footprint.
	- Rehabilitation efforts of temporary construction areas must also provide habitat for faunal species by placing log stacks and rock piles to provide shelter for small mammals and reptiles.
	- Refer to mitigation measure listed for the impact "Loss of Makhado Sweet Bushveld and associated plant species" above.
	- A clause must be included in contracts for ALL construction personnel (i.e. including contractors) working on the project stating that: "no wild animals will be hunted, killed, poisoned or captured. No wild animals will be imported into, exported from or transported in or through the province. No wild animals will be sold, bought, donated and no person associated with the development will be in possession of any live wild animal, carcass or anything manufactured from the carcass." A clause relating to fines, possible dismissal and legal prosecution must be included should any of the above transgressions occur for SCC.
	- Should any fauna SCC be encountered during construction and operation, these must be recorded (i.e. be photographed, GPS co-ordinates taken) and placed on iNaturalist, where possible.
	- The ECO must create a list with accompanying photographs of possible faunal SCC that could occur in the project area prior to construction. This photo guide must be used to determine if faunal SCC are encountered.
	- Provide environmental awareness training for construction personnel on the identification and importance of SCC, including Pangolins and Black-footed Cats.
	- Train staff in protocols for reporting wildlife encounters and handling any injured or trapped animals promptly and humanely.
	- If the development requires electric fencing ensure that it is wildlife-friendly electric fencing that is designed to minimise injury or mortality to nocturnal and burrowing species such as pangolins and black-footed cats. Specific specification include:
	  - Ensure the lowest live wire is no less than 30–40 cm above the ground.
	  - If additional wires below 40 cm are needed for security, use plain (non-electrified) wire or coated fencing wire at ground level to prevent electrocution.
	  - Ensure regular fence check to locate and free any fauna that are stuck (e.g., tortoises, pythons, etc.).
	  - Install smart energizers that regulate the electrical current in the fence, limiting the duration and frequency of the current flow through specific strands, to reduce the risk of faunal electrocution.
	  - Consider attaching small reflective markers or tags at pangolin head height (~30 cm) to increase visibility, reducing the chance of accidental contact at night.
	  - Provide wildlife gaps or crawl-unders in strategic locations such as riparian buffer zones/ecological corridors to allow safe wildlife

Impact / Aspect	Mitigation / Management Action
	movement where possible, particularly in non-sensitive operational zones. - Conduct pre-construction surveys and burrow checks by qualified reputable ecologists to identify active dens, burrows, and resting sites used by Pangolins, Black-footed Cats, and other SCC. - Where active burrows or dens are found within the construction footprint, - delay clearing, - Implement exclusion zones (no-go areas) around confirmed dens during construction to avoid disturbance and - If not breeding, and where feasible, relocate these structures and/or individuals, under expert guidance, to nearby suitable habitat. - If young are present and relocation is unfeasible adhere to exclusion zone until young move away from den/burrow. - Schedule ground disturbance activities outside sensitive periods such as breeding or rearing seasons for these species to reduce impacts on reproduction and juvenile survival. - Establish a monitoring programme throughout construction and early operation phases to detect any wildlife injuries or mortalities linked to fencing or machinery, snares (poaching) or road kill. - Adapt mitigation measures as necessary based on monitoring results to reduce risks to these species. - Rehabilitate disturbed areas post-construction with native vegetation to restore foraging and shelter habitat for these species and support their long-term persistence near the site. - Ensure strict enforcement and protection of the buffer zones around riparian areas as established by the aquatic specialist to maintain their function as ecological corridors. - Liaise with the landowner to ensure all game species currently stocked within the project footprint are translocated outside of the development footprint prior to construction. - In addition to the mitigation measures listed for the Loss of Faunal SCC, the following mitigation measures must be implemented: - Where possible, limit construction to daylight hours to reduce nocturnal faunal disturbance. - The ECO should appoint a member of staff to walk ahead of construction machinery directly prior to vegetation clearance. Should any faunal species be identified during the walk through, these should be allowed to move out of harm's way prior to vegetation clearance. - Dust suppression measures must be implemented in the dry and/or windy months. - All machinery, vehicles and earth moving equipment must be maintained and the noise these create must meet industry minimum standards. e.g. the sound generated by a machine must be below a certain decibel as prescribed in the relevant noise control regulations. - A Storm Water Management Plan must be drafted and implemented to prevent runoff entering aquatic systems and causing siltation and pollution of this faunal habitat. Hard surfaces should be avoided. - No construction night lighting must be allowed. If required, minimise lighting in open space areas within development and any external lights must be down lights placed as low to the ground as possible and installation of low UV emitting lights, such as most LEDs. Alights should also be on a sensor to minimise disturbance - Development must be designed to allow unencumbered movement, especially of small faunal species. - Internal and external fences/walls (if any) must allow for the movement of fauna through the development. These must have ground level gaps of 10cm x 10cm

Impact / Aspect	Mitigation / Management Action
	at 10m intervals. These gaps must be kept free of obstructions, including plant growth and debris. - All guttering and kerbstones must be sloped i.e. must be less than 45ө° on either side or kerbstones should be slanted or lowered (less than 10cm) at 10m intervals to allow for easy movement of toads - Steep sided drains, gutters, canals and open pits/trenches must be covered with mesh (5mm x 5mm) to prevent fauna falling in and getting stuck alternatively long trenches (e.g. cabling) must have exit ramps (< 45ө° slope) at 10m intervals. - No unnecessary structures that would act as pitfall traps for animals must be constructed - If there are retaining walls, steps should be formed to allow for small animals to move over them. These must be vegetated with plant species that offer cover. - Speed restrictions must be implemented on all vehicles within the development footprint (30km/h is recommended) to reduced faunal mortalities on the project roads. - Any faunal SCC that may die as a result of construction the ECO must keep a record (i.e. be photographed, GPS co-ordinates taken) and if the carcass is somewhat intact preserved (placed in a plastic bag and frozen) and donated to the nearest university, museum or SANBI. - A trained snake handler must be on call during construction to remove any snakes within construction areas. - A clause relating to fines, possible dismissal and legal prosecution must be included in all contracts for ALL personnel (i.e. including contractors) working on the project should any speeding or persecution of animals occur. - On-site induction must include an awareness section on the safety of animals and personnel aimed at preventing persecution and injury.
Operational Phase Terrestrial Biodiversity impacts including: - Spread of Weeds and Alien Plant Species. - Disturbance and Mortality of Faunal Species During Operation.	- Stabilise and revegetate disturbed areas not required for permanent infrastructure using fast-growing, locally indigenous species. - The site must be checked regularly for the presence of alien invasive species and weeds. When alien invasive species are found, immediate action must be taken to remove them. - Alien Invasive Plant Species and Weeds must be disposed on in line with the recommendations outlined in the Working for Water Programme. - Any equipment brought onto site must be clean to ensure no transfer or introduction of seeds. - No exotic species are permitted to be planted on site. Only indigenous plant species can be used for rehabilitation/landscaping. - The ECO must create a list with accompanying photographs of possible alien invasive species that could occur on site prior to construction. This photo guide must be used to determine if any alien invasive species are present. - Develop and implement an Alien Invasive Plant Management Plan or Method Statement that includes regular site inspections, early detection, rapid response protocols, and manual or chemical control methods. - Speed restrictions must be implemented on all vehicles within the project area (30km/h is recommended) to reduced faunal mortalities on the project roads. - Design and maintain perimeter fencing to allow safe passage of small and medium-sized wildlife (e.g., include wildlife gaps or crawl-unders), minimizing entrapment and movement barrier (refer to fence specifications listed above for construction phase impacts). - Use wildlife-sensitive lighting such as downward-facing, low-intensity, and motion-activated lights to reduce disturbance to nocturnal fauna. - Conduct periodic inspections to identify and release any trapped animals and repair fence damage to prevent mortality or injury. - Provide ongoing training for operational staff on wildlife protection, including how to report and respond to wildlife sightings or incidents.

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	- Maintain ecological corridors such as the buffers around riparian areas that have been delineated by the aquatic specialist. - Keep the contact details of a qualified snake handler readily available at the operations and maintenance building for prompt removal of any snakes found within buildings or infrastructure. - Speed restrictions must be implemented on all vehicles within the project area (30km/h is recommended) to reduced faunal mortalities on the project roads. - Design and maintain perimeter fencing to allow safe passage of small and medium-sized wildlife (e.g., include wildlife gaps or crawl-unders), minimizing entrapment and movement barrier (refer to fence specifications listed above for construction phase impacts). - Use wildlife-sensitive lighting such as downward-facing, low-intensity, and motion-activated lights to reduce disturbance to nocturnal fauna. - Conduct periodic inspections to identify and release any trapped animals and repair fence damage to prevent mortality or injury. - Provide ongoing training for operational staff on wildlife protection, including how to report and respond to wildlife sightings or incidents. - Maintain ecological corridors such as the buffers around riparian areas that have been delineated by the aquatic specialist. - Keep the contact details of a qualified snake handler readily available at the operations and maintenance building for prompt removal of any snakes found within buildings or infrastructure.
Decommissioning Phase Terrestrial Biodiversity Impacts, including: - Loss of indigenous vegetation - Infestation of Alien Plant Species - Disturbance and Mortality of Faunal Species During Decommissioning	- Appoint a suitably qualified specialist to compile a rehabilitation management plan for the site. - Plan decommissioning activities to avoid unnecessary disturbance to re-established vegetation, restricting heavy machinery movement to designated areas. - Clearly mark and fence off sensitive areas with recovering vegetation to prevent accidental damage during infrastructure removal. - Salvage and stockpile topsoil and seed banks from disturbed areas prior to decommissioning for use in rehabilitation. - Implement phased removal of infrastructure to minimize large-scale disturbance at any one time. - Use low-impact machinery and techniques wherever possible to reduce soil compaction and vegetation damage. - Rehabilitate disturbed areas immediately after infrastructure removal using locally indigenous plant species reflective of the pre-disturbance vegetation. - Monitor rehabilitated areas for at least two years post-decommissioning to assess vegetation recovery and address any erosion or invasive species issues. Ensure funds are placed aside and earmarked for monitoring post decommissioning. - Develop and implement an invasive alien plant management plan or method statement throughout the decommissioning and rehabilitation phases to prevent colonization of disturbed soils. - Provide environmental training for all personnel involved in decommissioning on the importance of protecting recovering vegetation and adhering to rehabilitation protocols. - Stabilise and revegetate disturbed areas using fast-growing, locally indigenous grassland species. - The site must be checked regularly for the presence of alien invasive species and weeds. When alien invasive species are found, immediate action must be taken to remove them. - Alien Invasive Plant Species and Weeds must be disposed on in line with the recommendations outlined in the Working for Water Programme. - Any equipment brought onto site must be clean to ensure no transfer or introduction of seeds. - No exotic species are permitted to be planted on site. Only indigenous plant species can be used for rehabilitation/landscaping.

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	- The ECO must create a list with accompanying photographs of possible alien invasive species that could occur on site prior to construction. This photo guide must be used to determine if any alien invasive species are present. - An alien invasive method statement must be incorporated into the EMPr. - Focus rehabilitation efforts on restoring general vegetation structure and cover using hardy, locally appropriate secondary grassland species, rather than restoring exact pre-clearance diversity. - Develop and implement an Alien Invasive Plant Management Plan or Method Statement that includes regular site inspections, early detection, rapid response protocols, and manual or chemical control methods. Disturbed areas must be monitored regularly and cleared of invasive species promptly. - The ECO should appoint a member of staff to walk ahead of machinery directly prior to decommissioning. Should any faunal species be identified during the walk through, these should be allowed to move out of harm's way prior to vegetation clearance. - External lighting should be avoided. If required, this should be down lighting and/or of low wattage. - Dust suppression measures must be implemented in the dry and/or windy months. - All machinery, vehicles and earth moving equipment must be maintained and the noise these create must meet industry minimum standards. e.g. the sound generated by a machine must be below a certain decibel as prescribed in the relevant noise control regulations. - Limit decommissioning to daylight hours to reduce nocturnal faunal disturbance. - Enforce speed limits on-site (30 km/hr). - Provide environmental awareness training for decommissioning personnel. - Rehabilitate disturbed areas.
Construction Phase Agricultural Impacts Including: - Reduction of land with natural vegetation for livestock grazing; - Soil erosion; - Soil pollution; - Soil compaction;	- Vegetation clearance must be restricted to infrastructure and access road areas. - Materials and equipment must only be stored in the pre-determined laydown areas. - Prior arrangements must be made with the landowner and neighbouring landowners to ensure that farm animals are moved to areas where they cannot be injured by vehicles traversing the area. - No boundary fence must be opened without the landowner or neighbouring landowners' permission. - No open fires are allowable during the construction phase. - The supporting infrastructure must be constructed as closely as possible to avoid fragmentation of the entire development area. - Land clearance must only be undertaken immediately prior to construction activities and only within the development footprint/servitude; - Unnecessary land clearance must be avoided; - Level any remaining soil removed from excavation pits that remained on the surface instead of allowing small stockpiles of soil to remain on the surface. - Regularly monitor the site to check for areas where signs of soil erosion may start to appear. - Should any soil erosion be detected, it must be addressed immediately through rehabilitation and surface stabilisation techniques. - Maintenance must be undertaken regularly on all vehicles and construction/maintenance machinery to prevent hydrocarbon spills; - Any waste generated during construction must be stored into designated containers and removed from the site by the construction teams; - Any left-over construction materials must be removed from site; - The construction site must be monitored by the Environmental Control Officer (ECO) to detect any early signs of fuel and oil spills and waste dumping; - Ensure battery transport and installation by accredited staff / contractors; and

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	- Compile (and adhere to) a procedure for safely handling battery cells during transport and installation. - Apart from the drilling and piling machines that need to install the PV arrays, all other vehicles and machines must utilise the internal access road network and not travel outside of it. - High impact construction activities (i.e. road construction, trenching etc) should be done outside of the rainy season and - Vehicles and equipment must park in designated parking areas.
Operational Phase Agricultural Impacts, including: - Soil erosion; - Soil pollution;	- The area around the project, including the internal access roads, must regularly be monitored to detect early signs of soil erosion on-set; and - If soil erosion is detected, the area must be stabilised using geo-textiles and facilitated re-vegetation. - Maintenance must be undertaken regularly on all vehicles and maintenance machinery to prevent hydrocarbon spills; - No domestic and other waste must be left at the site and must be transported with the maintenance vehicles to an authorised waste dumping area and - Regularly monitor areas alongside the roads, parking area and workshop for any signs of oil, grease and fuel spillage or waste.
Construction Phase Heritage Impacts, including: - Loss of Archaeological Resources. - Loss of Palaeontology resources.	- The conservation of these sites into the future must be ensured. This can be managed through the development of a Heritage Management Plan to be implemented for the duration of the project. - Should any buried archaeological resources or human remains or burials be uncovered during the course of development activities, work must cease in the vicinity of these finds. The South African Heritage Resources Agency (SAHRA) must be contacted immediately in order to determine an appropriate way forward.
Construction Phase Visual Impacts, including: - Loss of site landscape character due to the removal of vegetation and the construction of the project infrastructure. - Wind-blown dust due to the removal of large areas of vegetation. - Possible soil erosion from temporary roads crossing drainage lines. - Wind-blown litter from the laydown and construction sites. - Movement of large earth moving vehicles. - Construction of PV panels, laydowns site, construction camps and maintenance areas.	- Stockpiling of topsoil from impact areas for later use in rehabilitation. - Wind blown dust mitigation. - Dust mitigation for moving vehicles. - BESS structures should be painted a light green colour with a mid-grey hue to allow for reduce colour contrast while still allowing some reflectivity effect to reduce heat buildup (subject to BESS design specifications). - General buildings and structures should have walls painted a mid grey-green colour so as to better blend in with the bushveld vegetation. Roof sheeting should be a slightly darker mid-grey, green colour and preferably rough textured to reduce reflectivity. (Architectural / design variation around the grey-green colour would be acceptable). - Substation structures to be built to Eskom specification. The visual preference is that these smaller structures be constructed from a brown, rough-textured face brick with roof colour a grey hue material. - Light spillage mitigations and no overhead lighting. - Strict enforcement of non-littering with monthly checking of fencing for wind swept litter. - The laydown needs to be well set back from the adjacent roads and not located on prominent terrain with a minimum buffer of 100m from roads. - 50m setback from roads for monopole/ pylon placement. - Preference for routing to the north of Botteliers Road. - Review proposed routing so as to not enclose the adjacent property where eco-tourism activities are taking place.
Operational Phase Visual Impacts, Including: - Massing effect in the landscape from a large-scale landscape modification. - On-going soil erosion. - On-going windblown dust.	- Continued dust monitoring and management as needed. - Continued monitoring and management for possible soil erosion along drainage channels. - Continued management of the bushveld buffers areas along the road to ensure that these areas do not become a fire risk, and that the bushveld vegetation can continue to grow. - Continued light spillage monitoring and no overhead lighting.

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	- Moderate signage along the main access road with no excessive advertising banners displayed. - Continued monitoring for wind blown litter.
Decommissioning Phase Visual Impacts, Including: - Movement of vehicles and associated dust. - Wind-blown dust from the disturbance of cover vegetation / gravel.	- Dust suppression measures. - Litter management measures. - Removal of all structures and processing in terms of according to NEMWA specifications. - Rehabilitation of impacted areas to veld grasses.
Construction Phase Social Impacts, including: - Creation of employment and business opportunities, and the opportunity for skills development and on-site training (Positive). - Impacts associated with the presence of construction workers on local communities. - Impacts related to the potential influx of jobseekers. - Increased safety and security risks to landowners and farming operations associated with presence of construction workers on the site. - Increased risk of grass fires associated with construction related activities. - Nuisance impacts, such as noise, dust, and safety, associated with construction related activities and vehicles.	- Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase. - Where reasonable and practical, the proponent should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories. - 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 representatives from the MM to establish the existence of a skills database for the area. If such a database exists, it should be made available to the contractors appointed for the construction phase. - The local authorities, CPAs 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. - The recruitment selection process should seek to promote gender equality and the employment of women wherever possible. - The proponent should liaise with the MM with regards the establishment of a database of local companies, specifically BBBEE companies, which qualify as potential service providers (e.g., construction companies, catering companies, waste collection companies, security companies etc.) prior to the commencement of the tender process for construction service providers. These companies should be notified of the tender process and invited to bid for project-related work. - In the event of a construction camp being established, it should conform to Guidance Note for Worker Accommodation by the IFC and European Bank for Reconstruction and Development (EBRD) (August 2009) and a Construction Camp Management Plan should be prepared. - 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 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.

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	- 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. - 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, in consultation with the MM should investigate the option of establishing a MC to monitor and identify potential problems that may arise due to the influx of job seekers to 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. - 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. - Install CCTV cameras at key intersection points and access roads to the PV sites. - Fence off the PV sites prior to the start of the construction phase. Where feasible the option of fencing in the entire property should be investigated. - The proponent should enter into an agreement with the local landowners in the area whereby damages to farm property etc. during the construction phase will be compensated for. The agreement should be signed before the construction phase commences. - All farm gates must be closed after passing through. - Contractors appointed by the proponent should provide daily transport for low and semi-skilled workers that are not accommodated in the construction camp to and from the site. - The proponent should consider the option of establishing a MF (see above) that includes local farmers and develop a Code of Conduct for construction workers. This committee should be established prior to commencement of the construction phase. The Code of Conduct should be signed by the proponent and the contractors before construction activities commence. - 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. - The Environmental Management Programme (EMPr) 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 construction workers who are found guilty of stealing livestock and/or damaging farm infrastructure

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	are dismissed and charged. This should be contained in the Code of Conduct. All dismissals must be in accordance with South African labour legislation. - The proponent should become a member of the local Fire Protection Association. - 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 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. - The impact on road surfaces and repair thereof should be discussed with the Limpopo Provincial Roads Department. - Establishment of 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. - The movement of heavy vehicles associated with the construction phase should be timed to avoid times and days of the week, such as weekends, when the volume of traffic travelling along the access roads may be higher. - Dust suppression measures should be implemented, such as wetting on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers. - All vehicles must be road worthy, and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits.
Operational Phase Social Impacts, Including: - Establishment of infrastructure to improve energy security and support renewable sector (Positive). - Creation of employment and business opportunities (Positive). - Benefits for project landowners (Positive). - Benefits associated with socio-economic contributions to community development (Positive). - Visual impacts and associated impacts on sense of place. - Potential impact on property values. - Potential impact on tourism.	- Implement a skills development and training programme aimed at maximizing the number of employment opportunities for local community members. - Maximise opportunities for local content, procurement, and community shareholding. - Where reasonable and practical, the proponent should appoint local service providers and implement a 'locals first' policy, especially for semi and low-skilled job categories. - Where feasible, efforts should be made to employ local service providers that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria. - Before the operational phase commences the proponent should meet with representatives from the MM to establish the existence of a skills database for the area and list of service providers. - Where feasible, training and skills development programmes for locals should be initiated prior to the initiation of the operational phase. - The recruitment selection process should seek to promote gender equality and the employment of women wherever possible. - The proponent should liaise with the MM with regards the establishment of a database of local companies, specifically BBBEE companies, which qualify as potential service providers. - The proponents should liaise with the MM and CPAs to identify projects that can be supported by SED contributions.

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	- 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.
Aquatic Impacts associated with the PV Facility and Road Works, including internal and access roads.	- The watercourses and recommended buffer zones must be strictly adhered to during the construction phase of the project, with exception of any authorised activities and structures required to traverse an aquatic resource. Any supporting aspects and activities not required to be within the buffer area must adhere to the buffer zone; - Both sensitive and construction areas must be clearly demarcated. No activities should be allowed in the sensitive areas. - Landscape and re-vegetate all cleared areas as soon as possible to limit erosion potential; - It is strongly recommended that the project make use of existing road networks, before new areas are cleared for new access roads; - Install sedimentation/erosion protection measures prior to construction in the form of several rows of sand bags, silt traps and fences, this is particularly important in the access roads leading to/in proximity of any drainage channel and around active working areas for foundations; - Energy dissipation, such as stone berms or blocks must be strategically placed along the road margins as surface runoff leaves the roads and enters the surrounding environment with the potential for severe erosion and damage to road margins. The steeper the slope of the road, the more regular the berms should be spaced and can be as close as one meter apart where necessary; - Where passive re-establishment of vegetation along road margins is insufficient to stabilise soils and prevent erosion, hydroseeding, drought-tolerant indigenous grasses may be considered as a supplementary measure, provided it is feasible and available; - The section of roads which will traverse the lowest lying areas/potentially wet areas or steeper slopes will be subjected to traffic from vehicles for inspections and maintenance on site with the potential for damage to habitat and erosion and may require permeable paving as a solution. The permeable paving provides a stable platform to carry the loads of service vehicles whilst the vegetation growing through the permeable pavers compliments the surrounding vegetation, preventing erosion in these key areas; - An environmental control officer (ECO) inspection of the project area/development footprint and surrounding influenced areas must be completed during construction and within 1 month following the end of construction activities and within a week after the first rainfall event. Thereafter, routine monitoring should take place for the life of the project. Should erosion be developing this must be immediately addressed through appropriate and adaptive measures; - Modify security fencing to minimise barrier effects for small- and medium-sized animals. Modifications to fencing can involve maintaining a gap between the base of the fence and the ground. This could occur across the full extent of, or at regular intervals, along the fence line. This can also involve creating passageways by modifying the fence weave to facilitate animal movement; - Utilise non-reflective solar panels; and - If reflective solar panels are used, then reduce reflection effects for aquatic insects. Non-polarising white tape can be used around and/or across panels to minimise reflection which can attract aquatic insects as it mimics reflective surfaces of waterbodies.
Aquatic Impacts Associated with Erosion.	- All removed soil and material must not be stockpiled within any watercourses. Stockpiling should take place outside of the water resources. All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds;

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	- Install sandbags around soil stockpiles to prevent soils washing into the watercourses; - Document the soil profile on removal and ensure the soil is backfilled in the same horizon order in which it was removed; - Ensure that topsoil is appropriately stored and re-applied; and - Make sure that the soil is backfilled and compacted to appropriate geotechnical specifications for the project area. - Signs of erosion must be addressed immediately to prevent further erosion of the upgraded infrastructure; - Temporary and permanent erosion control methods, such as silt fences, flotation silt curtains, retention basins, detention ponds, interceptor ditches, seeding and sodding, riprap, erosion mats, and mulching will be implemented where necessary, in accordance with the Stormwater Management Plan; - Any exposed earth should be rehabilitated during the construction phase by establishing suitable vegetation (e.g., vigorous indigenous grasses) to protect the soil and minimise erosion; and - Landscape and re-vegetate all cleared areas before the operational phase to limit erosion potential.
Aquatic Impacts associated with the establishment of Alien Vegetation.	- Quarterly vegetation rehabilitation surveys need to be conducted of the vegetation within the project footprint; and - An alien invasive plant management plan needs to be compiled and implemented prior to construction to control and prevent the spread of invasive aliens. - Keep disturbances to within footprints and outside of buffer zones; - Control new stands of alien species as they arise; - Land users are required by law, to remove and / or control Category 1 alien and invasive vegetation according to the National Environmental Management: Biodiversity Act (NEMBA: Act 10 of 2004) (September 2020 List – GN1003). Additionally, unless authorised, in terms of the National Water Act, 1998 (Act No. 36 of 1998), no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. Category 3 plants are also prohibited from occurring in proximity to a watercourse; - It is recommended that Category 1 species are prioritised for control, with control of herbaceous weedy species (which would need to include follow-up control); - Foliar herbicide spray must not be used within any of the sensitive riparian areas, rather opt for mechanical removal or direct dribbled application to stumps (use a dye); and - Wet season vegetation rehabilitation surveys need to be conducted of the vegetation within the project footprint to stay on top of the alien vegetation for the life of the project. This will improve the biotic integrity over the long term. - Preventing the introduction, movement and spread of invasive species on and off the construction site.
Aquatic Impacts associated with the Operation of Vehicles and Heavy Machinery	- Operating heavy machinery in watercourse areas require careful consideration to minimise environmental impact; - Due to the scope of work, heavy machinery should only be operated in authorised water resource areas and under supervision of an ECO; - Where possible, schedule operations during the dry season when ground conditions are more stable and less prone to damage; - No heavy machinery shall be permitted within unauthorised water resource areas for any purpose, without the prior approval of the ECO (except emergency procedures); - All construction vehicles required for the proposed activities should only be allowed to use existing roads (including dirt roads);

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	- The route for vehicles (including heavy machinery) must be planned to avoid sensitive habitats, watercourse vegetation, buffer areas and other water bodies as far as feasibly possible; - Operators must be trained in operating machinery in sensitive environments and aware of the sensitivity of the area; - Sensitive areas must be demarcated so as to guide operators, labourers and contractors; - To minimise soil compaction and damage to wetland or riparian vegetation, a pioneer layer should be used when traversing wetland areas. The use of low ground pressure machinery (e.g., tracked vehicles or specialised tyres) may be alternatively considered where feasible and appropriate; - Sediment and erosion control measures—including silt fences, erosion control blankets, and sediment traps—to prevent soil runoff into water bodies associated with vehicular movements and disturbed surfaces will be implemented as part of the Stormwater Management Plan; - Spill prevention and response plans for potential leaks or spills of fuels, oils, or other hazardous substances will be implemented in accordance with Occupational Health and Safety (OH&S) protocols; - Have spill containment materials readily available on-site and train personnel in proper spill response procedures; - The contractor is responsible for cleaning up any spillages (e.g. concrete, oil, fuel), immediately; - Develop a restoration and rehabilitation plan to mitigate any long-term impacts of operating heavy machinery in wetlands and/or riparian areas; and - Implement measures such as revegetation of disturbed areas or habitat enhancement to restore the ecological functions of the water resource(s).
General Impacts of all activities on the identified aquatic resources.	- All work in and around watercourse areas, including those outside the specific project site, will be conducted in accordance with the Environmental Authorisation (EA) requirements to minimise impacts; - Aspects of the site development plan (SDP) such as laydown area and site camp should be located outside of the buffer zone, which would significantly reduce potential impacts; - Construction activities must take place during the low flow period (as much as possible). In addition to this, basic stormwater structures such as berms must be designed and implemented prior to and throughout the duration of the construction activities; - Stormwater runoff from the development area should enter drainage systems through diffuse channels fitted with flow attenuation/energy dissipation structures in the form of green infrastructure; - The contractors used for the project should have spill kits available to ensure that any fuel or oil spills are clean-up and discarded correctly; - Construction activities should, if possible, be scheduled during the dry season to reduce the erosion potential of exposed surfaces; - Temporary stormwater channels and preferential flow paths will be managed using measures such as aggregate or logs to dissipate and slow flows, this will be detailed in the Stormwater Management Plan; - Prevent uncontrolled access of vehicles through the river system that can cause a significant adverse impact on the hydrology and alluvial soil structure of these areas; - All chemicals, construction materials and toxicants to be used for the construction must be stored within bunded areas; - All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced in a designated area; - All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good “housekeeping”;

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	- Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel throughout the project area. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation); - Have action plans on site, and training for contactors and employees in the event of spills, leaks and other impacts to the aquatic systems; - All removed soil and material must not be stockpiled within the system. Stockpiling should take place away from the watercourse and buffer area. All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds; - Any exposed earth should be rehabilitated during construction by planting suitable vegetation, such as vigorous indigenous grasses, to protect the soil; - No dumping of construction material on-site may take place; - All waste generated on-site during construction must be adequately managed. Separation and recycling of different waste materials should be supported; - An alien invasive plant management plan needs to be compiled and implemented post construction to control current invaded areas and prevent the growth of AIPs on cleared areas. Alien vegetation must not be allowed to encroach onto the sites and must be continually removed during construction. Construction must not promote further alien plant disturbances in the surrounding area; - Heavy vehicles must be parked outside of the watercourse buffer zones except where needed for the construction process; - Erosion prevention and sediment control measures, including temporary and permanent methods such as silt fences, interceptor ditches, seeding and sodding, riprap, and mulching, will be implemented in accordance with the Stormwater Management Plan; - Rehabilitation of the watercourse areas, bed and banks must be budgeted for and should incorporated into the project life cycle and must be completed as soon as construction is completed. Rehabilitation must be done following an approved Rehabilitation Plan and in consultation with a suitably qualified SACNASP professional; - All areas outside the defined construction footprint shall be designated as 'no-go' zones during the construction phase, with strict restrictions on access by construction personnel to prevent disturbance of sensitive habitats upstream and downstream of the site; - Access to internal areas outside the active construction footprint that are essential for operational needs (such as firebreak maintenance and plant operation) should be controlled and managed in accordance with environmental best practices to minimise any impacts; - Clear demarcation and signage must be installed to delineate construction zones and no-go areas, and all site staff should be trained on access restrictions and environmental protection measures; - Areas exposed to erosion will be protected using appropriate measures such as sandbags, berms, and efficient construction practices, such as limiting the footprint and duration of exposed areas. This should be outlined in the Stormwater Management Plan; - All alterations or hardened surfaces associated with such structures or works are structurally stable, do not induce sedimentation, erosion or flooding, do not cause a detrimental change in the quantity, velocity, pattern, timing, water level and assurance of flow in a watercourse, do not cause a detrimental change in the quality of water in the watercourse, do not cause a detrimental change in the stability or geomorphological structure of the watercourse; and does not create nuisance condition, or health or safety hazards; and - Measures must be implemented at alterations (including at existing structures or activities) to 1) prevent detrimental changes to the breeding, nesting or feeding patterns of aquatic biota, including migratory species (if present), 2) allow for the free up and downstream movement of aquatic biota, including

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	migratory species (if present), and 3) prevent a decline in the composition and diversity of the indigenous and endemic aquatic biota (if present).
Aquatic biodiversity impacts associated with the construction and operation of the Grid Connection Infrastructure. These impacts include the access track associated with the Grid Connection Infrastructure.	- The watercourses and recommended buffer zones must be strictly adhered to during the construction phase of the project, with exception of any authorised activities and structures required to traverse an aquatic resource. Any supporting aspects and activities not required to be within the buffer area must adhere to the buffer zone; - Both sensitive and construction areas must be clearly demarcated. No activities should be allowed in the sensitive areas. - Landscape and re-vegetate all cleared areas as soon as possible to limit erosion potential; - Once the final line and associated pylon have been confirmed, a walkthrough is required for these areas, to ensure that sensitive areas are excluded for construction of pylons, through 'micro siting' of the proposed pylon locations; - The use of minimum pylons or pylons that spans wide enough to avoid sensitive areas is recommended; - The placement of pylons must avoid all delineated water resources and buffer; - Mixing of concrete must under no circumstances take place within the watercourses. Scrape the area where mixing and storage of sand and concrete occurred to clean once finished; and - Any water resources outside of the specific project site area and PAOI must be avoided. - It is strongly recommended that the project make use of existing road networks, before new areas are cleared for new access roads; - Install sedimentation/erosion protection measures prior to construction in the form of several rows of sand bags, silt traps and fences, this is particularly important in the access roads leading to/in proximity of any drainage channel and around active working areas for foundations; - Energy dissipation, such as stone berms or blocks must be strategically placed along the road margins as surface runoff leaves the roads and enters the surrounding environment with the potential for severe erosion and damage to road margins. The steeper the slope of the road, the more regular the berms should be spaced and can be as close as one meter apart where necessary; - Where passive re-establishment of vegetation along road margins is insufficient to stabilise soils and prevent erosion, hydroseeding, drought-tolerant indigenous grasses may be considered as a supplementary measure, provided it is feasible and available; - The section of roads which will traverse the lowest lying areas/potentially wet areas or steeper slopes will be subjected to traffic from vehicles for inspections and maintenance on site with the potential for damage to habitat and erosion and may require permeable paving as a solution. The permeable paving provides a stable platform to carry the loads of service vehicles whilst the vegetation growing through the permeable pavers compliments the surrounding vegetation, preventing erosion in these key areas; - An environmental control officer (ECO) inspection of the project area/development footprint and surrounding influenced areas must be completed during construction and within 1 month following the end of construction activities and within a week after the first rainfall event. Thereafter, routine monitoring should take place for the life of the project. Should erosion be developing this must be immediately addressed through appropriate and adaptive measures.
Aquatic biodiversity impacts associated with changes to water quality as a result of the construction and operation of the Grid Connection Infrastructure.	- All construction activities must be undertaken during the low flow (dry season) period as much as possible to limit surface flow transporting contaminants to the surrounding watercourse habitat; - All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good "housekeeping";

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	- During construction contractors used for the project must have spill kits available to ensure that any fuel or oil spills are clean-up and discarded correctly; - Have action plans on site, and training for contactors and employees in the event of spills, leaks and other impacts to the freshwater systems - Where feasible, as much material must be prefabricated and then transported to site to avoid the risks of contamination associated with mixing, pouring and the storage of chemicals and compounds on site; - No vehicle or machinery is allowed to be washed within a watercourse or its buffer area, and should preferably take place off site; - All chemicals and toxicants during construction must be stored in bunded areas; - All machinery and equipment should be inspected regularly for faults and possible leaks; these should be serviced off-site; - No indiscriminate dumping of construction material is permitted on-site. Any waste temporarily stored on-site must be placed in designated, contained areas in accordance with the approved waste management plan; and - All waste generated on-site during construction must be adequately managed. Separation and recycling of different waste materials should be supported.
Aquatic biodiversity impacts associated with erosion as a result of the construction and operation of the Grid Connection Infrastructure.	- All removed soil and material must not be stockpiled within any watercourse. Stockpiling should take place outside of water resources. All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds and/or any other appropriate erosion protection measures; - Install sandbags around soil stockpiles to prevent soils washing into the system; - Document the soil profile on removal and ensure the soil is backfilled in the same horizon order in which it was removed; - Ensure that topsoil is appropriately stored and re-applied; and - Make sure that the soil is backfilled and compacted to appropriate geotechnical specifications for the project area. - Signs of erosion must be addressed immediately to prevent further erosion of the upgraded infrastructure; - Temporary and permanent erosion control methods may include silt fences, flotation silt curtains, retention basins, detention ponds, interceptor ditches, seeding and sodding, riprap of exposed embankments, erosion mats, and mulching; - Any exposed earth should be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil; and - Landscape and re-vegetate all cleared areas as soon as possible to limit erosion potential.
Aquatic biodiversity impacts associated with the establishment of invasive alien vegetation as a result of the construction and operation of the Grid Connection Infrastructure.	- Quarterly vegetation rehabilitation surveys need to be conducted of the vegetation within the project footprint; and - An alien invasive plant management plan needs to be compiled and implemented prior to construction to control and prevent the spread of invasive aliens. - Keep disturbances to within footprints and outside of buffer zones; - Control new stands of alien species as they arise; - Land users are required by law, to remove and / or control Category 1 alien and invasive vegetation according to the National Environmental Management: Biodiversity Act (NEMBA: Act 10 of 2004) (September 2020 List – GN1003). Additionally, unless authorised, in terms of the National Water Act, 1998 (Act No. 36 of 1998), no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. Category 3 plants are also prohibited from occurring in proximity to a watercourse;

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	- It is recommended that Category 1 species are prioritised for control, with control of herbaceous weedy species (which would need to include follow-up control); - Foliar herbicide spray must not be used within any of the sensitive riparian areas, rather opt for mechanical removal or direct dribbled application to stumps (use a dye); and - Wet season vegetation rehabilitation surveys need to be conducted of the vegetation within the project footprint to stay on top of the alien vegetation for the life of the project. This will improve the biotic integrity over the long term. - Preventing the introduction, movement and spread of invasive species on and off the construction site, for example by washing down vehicles before they enter the site on designated areas.
Aquatic biodiversity impacts associated with the operation of heavy machinery and plant associated with the construction and operation of the Grid Connection Infrastructure.	- Operating heavy machinery in watercourse areas require careful consideration to minimise environmental impact; - Due to the scope of work, heavy machinery should only be operated in authorised water resource areas and under supervision of an ECO; - Implement seasonal restrictions on operations to avoid sensitive periods such as breeding seasons for wildlife or periods of high water levels (if applicable); - Schedule operations during the dry season when ground conditions are more stable and less prone to damage; - No heavy machinery shall be permitted within unauthorised water resource areas for any purpose. An exception being emergency procedures, however this must be done with the approval and supervision of the ECO; - Construction vehicles (including heavy machinery) must, as far as feasibly possible, use existing roads (including dirt roads). Where alternative routing is unavoidable, planned routes must avoid sensitive habitats, watercourse vegetation, buffer areas, and other water bodies; - Operators must be trained in operating machinery in sensitive environments and aware of the sensitivity of the area; - Sensitive areas must be demarcated so as to guide operators, labourers and contractors; - Use machinery with low ground pressure to minimise soil compaction and damage to wetland/riparian vegetation. Tracked vehicles or specialised low-ground-pressure tyres can be used if feasible/available; - Machinery can be equipped with attachments like swamp mats or bog mats to distribute weight and minimise disturbance to the watercourse areas; - Implement sediment and erosion control measures such as silt fences, erosion control blankets, or sediment traps to prevent soil runoff into water bodies associated with vehicular movements and disturbed/hardened surfaces; - Develop spill prevention and response plans to address potential leaks or spills of fuels, oils, or other hazardous substances; - Have spill containment materials readily available on-site and train personnel in proper spill response procedures; - The contractor is responsible for cleaning up any spillages (e.g. concrete, oil, fuel), immediately; - Develop a restoration and rehabilitation plan to mitigate any long-term impacts of operating heavy machinery in wetlands and/or riparian areas; and - Implement measures such as revegetation of disturbed areas or habitat enhancement to restore the ecological functions of the water resource(s).
General Aquatic biodiversity impacts associated with the construction and operation of the Grid Connection Infrastructure.	- The watercourse areas outside of the specific project site area must be avoided where possible; - Aspects of the site development plan (SDP) such as laydown area and site camps should be located outside of the buffer zone, which would significantly reduce potential impacts; - Construction activities must take place during the low flow period (as much as possible). In addition to this, basic stormwater structures such as berms must be designed and implemented prior to and throughout the duration of the construction activities;

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	- Stormwater runoff from the development area should enter drainage systems through diffuse channels fitted with flow attenuation/energy dissipation structures in the form of green infrastructure such as vegetated swales, or grassed channels; - The contractors used for the project should have spill kits available to ensure that any fuel or oil spills are clean-up and discarded correctly; - It is preferable that construction takes place during the dry season to reduce the erosion potential of the exposed surfaces; - Temporary storm water channels and preferential flow paths should be filled with aggregate and/or logs (branches included) to dissipate and slow flows limiting erosion; - Prevent uncontrolled access of vehicles through the river system that can cause a significant adverse impact on the hydrology and alluvial soil structure of these areas; - All chemicals, construction materials and toxicants to be used for the construction must be stored within bunded areas; - All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced in a designated area; - All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good "housekeeping"; - Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel throughout the project area. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation); - Have action plans on site, and training for contactors and employees in the event of spills, leaks and other impacts to the aquatic systems; - All removed soil and material must not be stockpiled within the system. Stockpiling should take place away from the watercourse and buffer area. All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds and/or any other appropriate erosion protection measures; - Any exposed earth should be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil; - No indiscriminate dumping of construction material is permitted on-site. Any waste temporarily stored on-site must be placed in designated, contained areas in accordance with the approved waste management plan; - All waste generated on-site during construction must be adequately managed. Separation and recycling of different waste materials should be supported; and - An alien invasive plant management plan needs to be compiled and implemented post construction to control current invaded areas and prevent the growth of AIPs on cleared areas. Alien vegetation must not be allowed to encroach onto the sites and must be continually removed during construction. Construction must not promote further alien plant disturbances in the surrounding area. - Heavy vehicles must be parked outside of the watercourse buffer zones except where needed for the construction process. - Erosion prevention and sediment control measures must be implemented. Temporary and permanent erosion control methods may include silt fences, interceptor ditches, seeding and sodding, riprap of exposed embankments, and mulching. - Rehabilitation of the watercourse areas, bed and banks must be budgeted for and should incorporated into the project life cycle and must be completed as soon as construction is completed. Rehabilitation must be done following an approved Rehabilitation Plan and in consultation with a suitably qualified SACNASP professional.

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	- All areas upstream and downstream of construction footprint must be demarcated as a 'no-go' zone for the duration of the construction process. No activities or site staff are permitted to enter these areas. - Areas exposed to erosion must be protected through the use of sandbags, berms and efficient construction processes i.e., limiting the extent (footprint) and duration period that areas are exposed. - All alterations or hardened surfaces associated with such structures or works are structurally stable, do not induce sedimentation, erosion or flooding, do not cause a detrimental change in the quantity, velocity, pattern, timing, water level and assurance of flow in a watercourse, do not cause a detrimental change in the quality of water in the watercourse, do not cause a detrimental change in the stability or geomorphological structure of the watercourse; and does not create nuisance condition, or health or safety hazards. - All mitigation measures must be implemented at alterations (including at existing structures or activities) to 1) prevent detrimental changes to the breeding, nesting or feeding patterns of aquatic biota, including migratory species (if present), 2) allow for the free up and downstream movement of aquatic biota, including migratory species (if present), and 3) prevent a decline in the composition and diversity of the indigenous and endemic aquatic biota
Avifaunal Impacts associated with the loss of Habitat during the lifespan of the PV facility.	- All High sensitivity areas must be avoided for development. Only low impact developments can be implemented in the High sensitivity areas, such as upgrading existing roads. - A nest walkdown must be performed prior to clearance of the site. If nests are found, necessary permits and appropriate relocation mitigations should be followed under the consultation with a qualified specialist. - Solar panels must be mounted on pile driven or screw foundations, such as post support spikes, rather than heavy foundations, such as trench-fill or mass concrete foundations, to reduce the negative effects on natural soil functioning, such as its filtering and buffering characteristics, while maintaining habitats for both below and above-ground biodiversity where possible. - The areas to be developed must be specifically demarcated to prevent movement into surrounding environments. - Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, must under no circumstances be fragmented or disturbed further. - Non-woody indigenous vegetation to be maintained under the solar panels if possible to ensure biodiversity is maintained and to prevent soil erosion (Beatty et al, 2017; Sinha et al, 2018). - Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion. This will also reduce the likelihood of encroachment by alien invasive plant species. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are indigenous to this vegetation type. - A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. No routine servicing of equipment to be conducted on site, unless in necessary situations. All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers. Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them leaking and entering the environment. - Cement must be mixed in a designated area on a liner away from water sources and buffers and that successful rehabilitation of the construction areas can take place.

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	- Leaking equipment and vehicles must be repaired immediately or be removed from PAOI to facilitate repair. - A fire management plan needs to be complied to restrict the impact of fire. - Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all areas of construction. This includes wetting of exposed soft soil surfaces. No non-environmentally friendly suppressants may be used as this could result in the pollution of water sources. - Only environmentally friendly substances may be used for the cleaning/washing of the panels
Direct Avifaunal Impacts during the lifespan of the PV facility.	- The No-Go Buffer areas must be avoided for development. Only low impact developments can be implemented in the High sensitivity areas, such as upgrading existing roads. - All personnel should undergo environmental induction with regards to avifauna and in particular awareness about not harming, collecting, or hunting terrestrial species, and owls, which are often persecuted out of superstition. Signs must be put up to enforce this. - The duration of the construction must be kept to a minimum to avoid disturbing avifauna. - Latest technology solar panels with an anti-reflective coating must be used. This will also improve the light transmittance and therefore increases the overall efficiency. - All areas to be developed must be walked through prior to any activity to ensure no nests or avifauna species are found in the area. Should any Species of Conservation Concern be found and not move out of the area, or their nest be found in the area a suitably qualified specialist must be consulted to advise on the correct actions to be taken. - All the parts of the infrastructure must be nest proofed and anti-perch devices placed on areas that can lead to electrocution - Outside lighting must be designed and limited to minimize impacts on fauna. All outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (red/green) lights should be used. - Wire mesh fencing should be used, with markers placed on the fence to enhance visibility. Additionally, openings of up to 30cm by 30cm if possible, must be incorporated at the bottom of the fence to facilitate the free movement of ground-favouring species. - As far as possible and feasible, power cables within the PAOI should be thoroughly insulated and preferably buried. - Any exposed parts must be covered (insulated) to reduce electrocution risk - All infrastructure, must be removed if the facility is decommissioned. - All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limit (40 km/h), to respect all forms of wildlife. Speed limits must be enforced to ensure that road killings and erosion is limited. - All project activities must be undertaken with appropriate noise mitigation measures to avoid disturbance to avifauna population in the region - Infrastructure must be consolidated where possible in order to minimise the amount of ground and air space used. - Use environmentally friendly cleaning and dust suppressant products
Avifaunal Impacts associated with habitat loss during the lifespan of the Grid Connection Infrastructure.	- A nest walkdown must be performed prior to clearance of the site. If nests are found, necessary permits and appropriate relocation mitigations should be followed under the consultation with a qualified specialist. - The areas to be developed must be specifically demarcated to prevent movement into surrounding environments. - Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, must under no circumstances be fragmented or disturbed further.

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	- Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion. This will also reduce the likelihood of encroachment by alien invasive plant species. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are indigenous to this vegetation type. - A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. No routine servicing of equipment to be conducted on site, unless in necessary situations. All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers. Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them leaking and entering the environment. - Cement must be mixed in a designated area on a liner away from water sources and buffers and that successful rehabilitation of the construction areas can take place. - Leaking equipment and vehicles must be repaired immediately or be removed from PAOI to facilitate repair. - Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all areas of construction. This includes wetting of exposed soft soil surfaces. No non-environmentally friendly suppressants may be used as this could result in the pollution of water sources.
Direct Avifaunal Impacts during the lifespan of the Grid Connection Infrastructure.	- All personnel should undergo environmental induction with regards to avifauna and in particular awareness about not harming, collecting, or hunting terrestrial species, and owls, which are often persecuted out of superstition. Signs must be put up to enforce this. - The duration of the construction must be kept to a minimum to avoid disturbing avifauna. - Bird Flappers and diverters must be placed on all new overhead powerlines, this must be conducted in accordance with industry standards. - Overhead cables/lines must be fitted with industry standard bird flight diverters in order to make the lines as visible as possible to collision-susceptible species. Shaw et al (2021) demonstrated that large avifauna species mortality was reduced by 51% (95% CI: 23–68%). Recommended bird diverters such as flapping devices (dynamic device) and thickened wire spirals (static device) that increase the visibility of the lines should be fitted in accordance with the industry standards. A bird diverter with high visibility under low light conditions is highly recommended when most species move from roosting to feeding sites. - Any OHLs must be of a design that minimizes electrocution risk by using adequately insulated 'bird friendly' monopole structures as per the Eskom/EWT guidelines. - Ensure that the phase cables are spaced far enough apart to reduce the risk of large birds (vultures) touching both simultaneously. If such separation (isolation) cannot be provided, exposed parts must be covered (insulated) to reduce electrocution risk. - All the parts of the infrastructure must be nest proofed and anti-perch devices placed on areas that can lead to electrocution - Any exposed parts must be covered (insulated) to reduce electrocution risk - A maintenance schedule must be followed twice yearly to ensure that all components are still intact and does not pose an electrocution risk, this must be done for the extent of the lifetime of the powerline. - All infrastructure, must be removed if the facility is decommissioned. - Post-construction monitoring should follow the BirdLife South Africa best practice guidelines for solar energy facilities (BirdLife South Africa, 2017). If monitoring results indicate excessive bird fatalities, then adaptive mitigations

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	should be implemented. Before implementation, these should be discussed with the avifaunal specialist and ECO and could include the retrofitting/incorporation of additional visual cues/diverters to existing infrastructure. - Post construction monitoring must be performed for one year quarterly, following the construction phase by an avifauna specialist. Following this the results of the monitoring must be used to inform whether another year of monitoring is necessary. This should include collision monitoring for vultures due to the high density of vultures found in the area.
Impacts and Risks Associated with the construction phase of the preferred BESS technology (Solid State Lithium Ion BESS)[1]	- 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. - 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. - 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 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. Bore hole, 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. - Refer to Social Specialist Study for this 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. - First aid provision on site. - 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. - The company responsible for the facility at this stage is to have: 1. Emergency plan to be in place prior to commencement of construction. 2. Fuel spill containment procedures and equipment to be in place. 3. Hot-work permit and management system to be in place. - 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.

- [1] The mitigation measures detailed in the following sections are only those associated with the preferred BESS Technology (i.e. Solid State Lithium ion). Should alternative technologies be selected, different mitigation measures would apply.

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	- Batteries are usually stored at 50% charge to prolong life but may be shipped fully discharged. - This level of detail should be understood so as to assess the risk during transport and storage. - The company responsible for the battery installation should ensure suitably competent transport companies are appointed. - The company responsible for transportation should ensure: - Compliance with National Road Traffic Act regulation 8 – dangerous goods. - Port Authorities should be alerted to the overall project and the hazardous nature of the contents of battery containers being imported. Note. If, as per one of the typical suppliers (Tesla) indications, the containers are classified as IMDG Class 9 – the containers will not receive any special care in the ports and may be stored next to flammables. Port emergency response in particular need training on mitigating battery hazards. - 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. - The Emergency plan must determine and address: - What gases would be released in a fire and are there inhalation hazards. - Extinguishing has two important elements, put out fire and to provide cooling. Different approaches may be needed for small fire – e.g., put out, and for large fires e.g., cool with copious quantities of water. Note inert gases and foam may put out the initial fire but fail to control thermal runaway or to cool the batteries resulting in reignition. - What initial fire extinguishing medium should be used. - Whether there are any secondary gases or residues from use of extinguishers. - If water is appropriate, determine if the system needs outside connections to sprinklers inside the container. - First responders need to know what media to use, especially if water totally unsuitable and if there are no connection points for water etc. - Must the container be left unopened or opened. - PPE to be specified including possible exposure to chemicals and fumes as well as radiate heat. - Containment of residues/water/damaged equipment. - Suitable safe making and disposal plan for after the event i.e. how do responders deal with partially charged damage units, contaminated surfaces (e.g., HF residues). - During transport this is only likely to happen due to possible inappropriate emergency response, e.g., opening containers when they may be the type that should be left to burn out. - For simplicity one transport route would be preferable. - The route needs to be assessed in terms of responding local services, rest places for drivers, refuelling if required, break down services available etc. - Once an import route has been chosen, e.g., Richards Bay or Durban and along N2/N3/N11 etc, then the appointed transport company should ensure key emergency services on route could be given awareness training in battery fire/accident response. Emergency response planning and training referred to above may be important for key locations such as the mountain passes / tunnels. - 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.

Impact / Aspect	Mitigation / Management Action
	- 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 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. - Likelihood similar to fire above. - 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. - SHEQ policy in place. - A detailed construction Risk Assessment prior to work. SHE procedure in place. - PPE to be specified. - SHE appointees in place. - Contractors safety files in place and up to date. - SHE monitoring and reporting programs in place. - Standard construction site rules regarding traffic, reversing sirens, rigging controls, cordoning off excavations etc. - Civil and building structures to National Building Regulations and building Standards Act 103 of 1977 SANS 10400 and other relevant codes. - Other constructions such as roads, sewers etc also to relevant SANS standards. - All normal procedures for working at heights, hot work permits, confined space entry, cordon off excavations etc to be in place before construction begins. - Emergency response plan to be in place before construction begins. - Standard maintenance of condition of electrical equipment and safe operating instructions. Ability to shut off power to systems in use on site. - If persons are decanting fuels or dealing with other highly flammable materials care should be taken regarding possible static discharge, installations to be suitably designed and maintained. - Lightning strike rate in the study area is moderate. - Outside work must be stopped during thunderstorms. Lighting conductors may be required for the final installation, to be confirmed during design phase. - Dust suppression as per normal construction practices, e.g. dampening on roads. - PPE for specific construction workers, e.g. dust masks depending on conditions on site. - Normal construction site practices for preventing and containing fuels/paint/oil etc spills. - Bunding under any temporary tanks, curbing under truck offloading areas and sealed surfaces (e.g., concrete) under truck parking area is particularly important. - Spill clean-up procedures to be in place before commencing construction. - Sewage and any kitchen liquids - containment and suitable treatment/disposal e.g. septic tank and soak away system. - 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.

Impact / Aspect	Mitigation / Management Action
	- 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. - Water management plan and spill containment plans to be in place. - Refer to visual impact assessment. - Design by experienced contractors using internationally recognized and proven technology. - Project management with deviation monitoring. - 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. Isolated location both helps and hinders security. - Night lighting to be provided both indoors and outdoors where necessary. - All safety measures listed above. - Emergency procedures need to be practiced prior to commencement of construction. - In addition, if involved in an external fire thermal runaway 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.
Impacts and risks Associated with the operational phase of the preferred BESS technology (Solid State Lithium Ion BESS)	- The operation and maintenance phase will be managed according to all the requirements of the Occupational Health and Safety Act 85 of 1993. SHEQ policy in place. - 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. - SHE procedure in place, e.g., PPE specified, management of change, integrity monitoring. - SHE appointees in place. - Training of staff in general hazards on site. - 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 and to include aspects such as: - appointment of emergency controller, - 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. - Solid state batteries sealed, individual batteries in modules which are also sealed, pre-packed in the container.

Impact / Aspect	Mitigation / Management Action
	- 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. - 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. - Design to ensure continuous noise does not exceed 85dB within the facilities or at any other location on site or 61 dB at the site boundary, e.g., emergency generator, air compressor etc. - Employees to be provided with hearing protection if working near equipment that exceeds the noise limits. - Building and container facilities to comply with Occupational Health and Safety Act 85 of 1993 specifically the thermal, humidity, lighting and ventilation requirements of the Environmental Regulations for Workplaces. - 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. - Training in lifting techniques. - Training in working at heights. - If equipment is at height (see OHS Act General Safety Regulation 6), ensure suitable safe (electrically and physically) ladders / harnesses etc. are available. - 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 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.

Impact / Aspect	Mitigation / Management Action
	- 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 300 units this would mean an event once 3 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 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. - Modern lithium container design put the PCS in another part of the container with a fire rated wall separating it from the battery. Alternately the PCS is another container altogether. - Electrical equipment will be specified to suit application. - Emergency response plan and employee training referred to above is to be in place. - This is only really likely to happen due to possible inappropriate emergency response, e.g., opening containers when they may be the type that should be left to burn out. - Modern state of the art containers have ventilation systems for vapours. - 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.

Impact / Aspect	Mitigation / Management Action
	- NOTE. Refer to Appendix A for an initial approximation of worst-case possible explosion impact zones. - 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. - Acid resistant PPE (e.g., overalls, gloves, eyeglasses) to be specified for all operations in electrolyte areas. PPE to be increased (e.g., full-face shield, aprons, chemical suits) for operations that involve opening equipment and potential exposure, e.g., sampling, maintenance. - All operators/maintenance staff trained in the hazards of chemicals on site. - Batteries contained, modules contained and all inside a container that acts as bund. - Refer to fire above as all the protective measures apply to prevent toxic smoke. Refer to fire above as all the measures apply to mitigate toxic smoke. - 24/7 helpline response. - Standard dangerous goods requirements for Hazmat labels. - All operators/maintenance staff trained in the hazards. - NOTE Refer to Appendix A for an initial approximation of worst case possible noxious smoke impact zones. - 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. - All normal working at heights, hot work permits, confined space entry, cordon off unsafe areas/works etc to be in place. - Emergency response plan. - Civil design to take seismic activity into account. - Codes and guidelines for electrical insulation. - Suitable PPE to be specified. - Low voltage equipment (e.g., batteries) separated from high voltage (e.g., transmission to grid). - Ensure trained personnel and refer to guideline – IEE 1657 – 2018. - Ensure compliance with Eskom Operating Regulations for high voltage systems including access control, permit to work, safe work procedures, live work, abnormal and emergency situations, keeping records. - Electromagnetic fields, impact on other equipment e.g., testing devices, mobile phones – malfunction, permanent damage. - Software also need to be kept as update to date as reasonably practicable. - Consider suitably located Emergency stop buttons for the facility and the other equipment on site. - PPE to consider static accumulation for entering the facility, and particularly the battery containers especially after a high temperature shut down where there could possibly be flammable materials. - The procedures for responding to alarm and auto shut down on containers, needs to consider that there may be a dangerous environment inside and how to protect personnel who may enter to respond. - Lightning strike rate in proposed development area is moderate. - All outside work must be stopped during thunder storms.

Impact / Aspect	Mitigation / Management Action
	- Lighting conductors may be required for the installation, to be confirmed during design. - Especially after any warning alarms have gone off, but possibly even normally the container could be treated as entering a confined space and similar procedures could be in place, e.g., do not enter alone, gas testing prior to entering, ensure adequate ventilation. - Bunding under any outdoors tanks, curbing under truck offloading areas and sealed surfaces (e.g., concrete) under truck parking area is particularly important. - Sewage and any kitchen liquids - containment and suitable treatment/disposal e.g. septic tank and soak away. - Procedures for dealing with damaged/leaking equipment as well as clean-up of spills. - Normal site practices for preventing and containing diesel/paint etc spills. - Waste management plan to be in place e.g., liquid waste treatment or suitable removal and disposal will be provided. - Spill clean-up procedures to be in place before bringing container on site, including spill kits – non combustible materials, hazmat disposal. - The National Environment Management Act (NEMA) has a list of substances with Reportable spill Quantities, ensure compliance with this. - Implement waste segregation (e.g., electronic equipment, chemicals, domestic) and management on the site. - Water usage to be monitored on site. Handling protocols to be provided by supplier of batteries. - Water management plan and spill containment plans to be in place. - Investigate end of Life plan for solid state batteries - reuse / recovery / reconditioning. - Similarly, for decommissioned containers – reuse / recovery / repurpose. - Refer to Visual Impact Assessment which is to include the BESS installation once design details are available. - Design by experienced contractors using internationally recognized and proven technology. Project management with deviation monitoring. - Fencing around electrical infrastructure to SANS standard and Eskom Guidelines. - Consider motion detection lights and CCTV. - The hazardous nature of the electrical and battery equipment should be clearly indicated – e.g., Skull and Cross Bones or other signs. - Isolated location both helps and hinders security. - Night lighting to be provided both indoors and outdoors where necessary. - Cyber security needs monitoring. - Remote access to system needs to be negotiated and controlled. - Password controls, levels of authority etc. Protection of the National Electricity Grid from Cyber-attacks accessing through the BESS. - Cyber emergency procedures – should be in place prior to commissioning. - All safety measures listed above. - Emergency procedures need to be practiced prior to commencement of operations. - Escape doors should swing open outwards and not into the container. Doors should be able to be hooked open when persons are inside the container, i.e. they should not be automatically self-closing. - More than one exit from buildings. - Storage of spare batteries (e.g., in stores on site or elsewhere) also needs to consider possible thermal run away. - 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.

Impact / Aspect	Mitigation / Management Action
Impacts and Risks Associated with the decommissioning phase of the preferred BESS technology (Solid State Lithium Ion BESS)	- End of Life shutdown procedure including a Risk Assessment of the specific activities involved. - Where possible re-purpose the solid-state batteries / containers and equipment with associated environmental impact considered. - Disposal according to local regulations and other directives such as the European Batteries Directive. - End of life, which is affected by temperature and time, cycles etc, should be predefined and the monitoring should be in place to determine if it has been reached. - Applicants should seek the opinion from a waste consultant on how to correctly dispose of hazardous waste.

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.