VRYBURG SOLAR 3, NORTH WEST PROVINCE

ENVIRONMENTAL MANAGEMENT PROGRAMME

Revision 1

October 2020

Prepared for

Vryburg Solar 3 (Pty) Ltd
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PROJECT DETAILS

DEFF Reference No.	:	14/12/16/3/3/1/1941
Title	:	Vryburg Solar 3, North West Province Motivation for Amendment of the Environmental Authorisation
Authors	:	CSIR
Revised By	:	Savannah Environmental Ethanne Soar Lisa Opperman Jo-Anne Thomas
Client	:	Vryburg Solar 3 (Pty) Ltd
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Revision	:	1

When used as a reference this report should be cited as: Savannah Environmental (2020) Environmental Management Programme: Vryburg Solar 3, North West Province

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1 INTRODUCTION

This Environmental Management Programme (EMPr), Revision 1, has been prepared and updated by Savannah Environmental (Pty) Ltd (2020) as part of the requirements of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) Environmental Impact Assessment (EIA) Regulations promulgated in Government Gazette 40772 and Government Notice (GN) R326, R327, R325 and R325 on 7 April 2017. This EMPr was submitted to the National Department of Environmental Affairs (DEA) as part of the Application for Environmental Authorisation (EA) for the proposed development of a 115 MW solar PV Facility and associated electrical infrastructure and has been updated based on the Part 2 Amendment Process being undertaken to include the construction and operation of a Battery Energy Storage System (BESS) and substation collector components within the authorised development footprint of Vryburg Solar 3,, near Vryburg in the North West Province (Figure 1). The proposed project is referred to as Vryburg Solar 3, and the Project Applicant is Vryburg Solar 3 (Pty) Ltd. It must be noted that the DEA is now known as the Department of Environment, Forestry and Fisheries (DEFF).

As noted in the Basic Assessment (BA) Report, Vryburg Solar 3 (Pty) Ltd (the project developer) are proposing to develop three solar PV Facilities and associated electrical infrastructure (including a 132 kV distribution line from each PV Facility to the Eskom Mookodi Substation), near Vryburg in the North West Province. This EMPr only considers the proposed development of the Vryburg Solar 3 project.

The proposed project falls entirely within the Renewable Energy Zone (REDZ) 6 (i.e. Vryburg REDZ), that was Gazetted in February 2018 by the Minister of Environmental Affairs. As noted in Government Notice 114, a BA Process in terms of Appendix 1 of the EIA Regulations (2014, as amended) will be undertaken for the proposed project, with a 57 day decision-making timeframe.

This EMPr was submitted as part of the BA Report to the Competent Authority for decision-making. This EMPr has been revised to include additional mitigation measures recommended through the Part 2 amendment process being undertaken for the project, which includes the addition of a BESS and substation collector components to the project scope. This EMPr is intended as a "living" document and should continue to be updated regularly, as needed.

Changes made to this EMPr have been underlined for ease of reference.

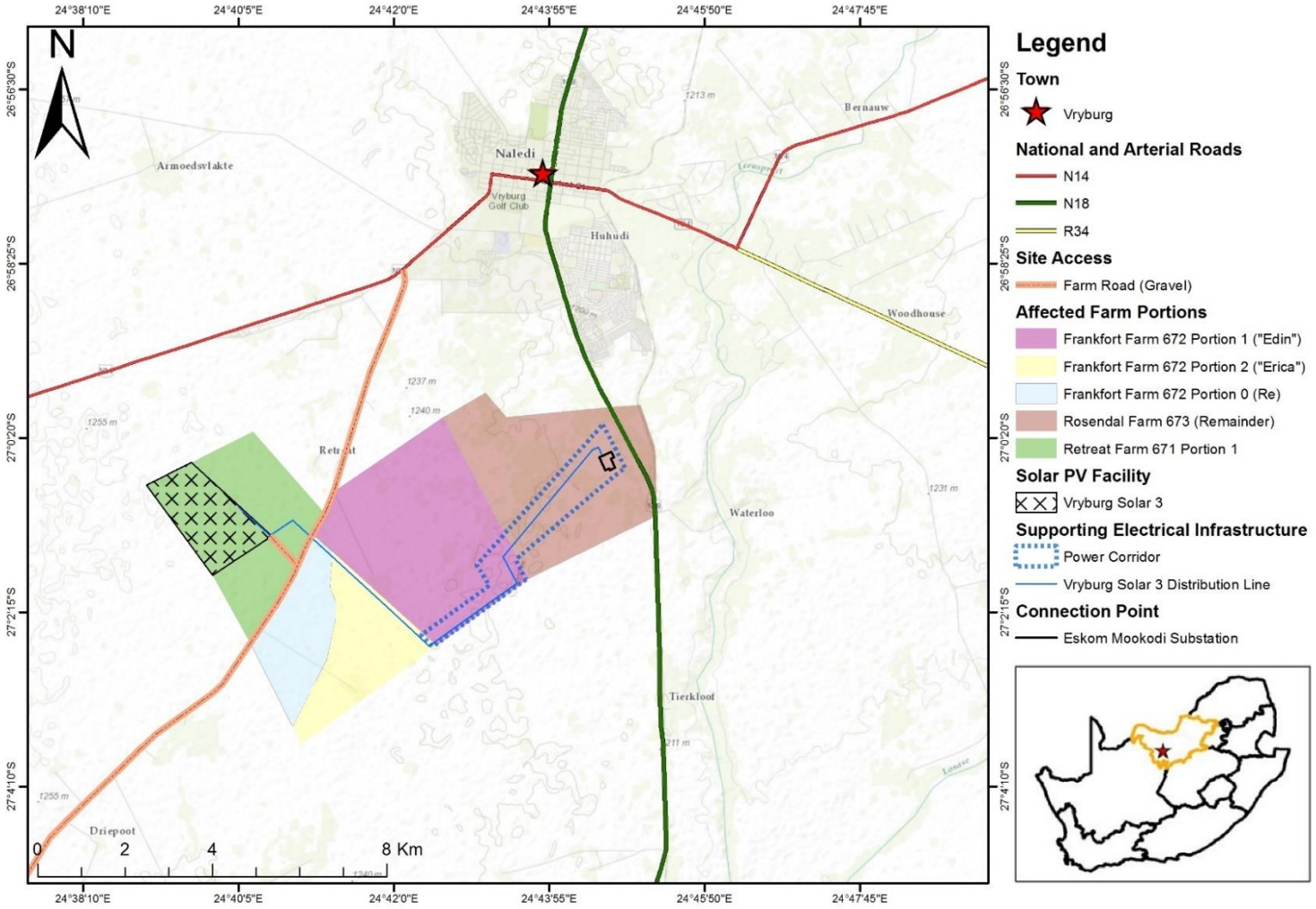


Figure 1: Locality Map of the proposed Solar PV Facilities (showing affected farm portions).

2 PROJECT DESCRIPTION

The proposed project will make use of PV solar technology to generate electricity from the sun's energy. The Applicant is proposing to develop a facility with a possible maximum installed capacity of 115 MW Direct Current (DC) which produces 100 MW Alternating Current (AC) of electricity from PV solar energy. The project will also include a Battery Energy Storage (BESS) with a capacity of up to 500MW/500MWh to allow for extended hours of generation from the solar energy facility. Once a Power Purchase Agreement (PPA) is awarded, the proposed facility would generate electricity for a minimum period of 20 years. The property on which the solar PV facility is to be constructed will be leased by the Project Developer from the property owners for the life span of the project.

The proposed solar facility will consist of the following components listed in the table below:

Table 1. Project components and respective specifications

Project component	Specifications (dimensions, height and/or length)
Solar Facility	
Solar Field • PV Modules; • Single Axis Tracking structures (aligned north-south), Fixed Axis Tracking (aligned east-west), or Fixed Tilt Mounting Structure (all options will be considered in the design); • Solar module mounting structures comprised of galvanised steel and aluminium; and • Solar module substructure foundations will likely be drilled into the ground, filled and then posts fixed inside them. **Building Infrastructure** • Offices; • Operational and maintenance control centre; • Warehouse/workshop; • Ablution facilities; • 35-45 Central Inverter stations; • On-site substation building (including lighting conductor poles); and • Guard Houses. **Associated Infrastructure** • On-site substation and collector infrastructure; • Internal distribution lines of up to 33 kV; • Underground low voltage cables or cable trays; • Internal gravel roads; • Fencing; • Panel maintenance and cleaning area; • Stormwater channels • Temporary work area during the construction phase • Electrochemical battery storage systems and associated multi-core 22kV or 33kV underground cables	270ha and 10m high(and up to 25m for the lightning conductor poles)

Electrical infrastructure	
• 132 kV overhead distribution line (single or double circuit) to connect to the existing Eskom Mookodi substation	To be developed in a 31m wide servitude 12.5km in length and 30m high
• Gravel service road beneath the 132 kV power line	6m wide
• Associated electrical infrastructure at the Eskom Mookodi Substation (including but not limited to feeders and busbars at the Eskom Mookodi Substation)	Within the Mookodi Substation's footprint
Additional infrastructure	
• Access road to the site • The BESS components will be assembled off-site and delivered to the project site for installation. The BESS will be installed within the construction compound/laydown area of the solar energy facility.	8m wide

The proposed project can be divided into the following three main phases:

- Construction Phase;
- Operational Phase; and
- Decommissioning Phase.

Activities undertaken as part of the above phases may have environmental impacts and has therefore been assessed by the specialist studies (Appendix D of the BA Report).

It is proposed that the local municipality will provide services in terms of water, waste removal, and sewage for the construction phase of the proposed project. However, should the municipality not have adequate capacity available for the handling of waste and sewage, and the provision of water; then the Applicant will make use of private contractors to ensure that the services are provided. The Applicant will also ensure that adequate waste disposal measures are implemented by obtaining waste disposal dockets of waste and sewage that is removed from site and ensuring that appropriate contractors are appointed for waste removal and disposal. Any electricity required during the construction phase will be generated through the use of onsite generators. During the operational phase, the project will not have any electricity requirements as the project itself will transmit and distribute electricity.
The construction phase will take place subsequent to the issuing of an EA from the DEFF and a successful off taker is selected. The construction phase is expected to extend for approximately 12 months.

The main activities that will form part of the construction phase are:

- Removal of vegetation for the proposed infrastructure;
- Excavations for infrastructure and associated infrastructure;
- Establishment of a laydown area for equipment;
- Stockpiling of topsoil and cleared vegetation;
- Creation of employment opportunities;
- Transportation of material and equipment to site, and personnel to and from site; and
- Construction of the solar field, 132 kV distribution line and additional infrastructure

The following main activities will occur during the operational phase:

- Generation of 115 MW of electricity to add to the national grid;
- The transmission of electricity generated from the proposed Vryburg Solar Facility to the Eskom Mookodi substation;
- Save and store excess electrical output within the BESS from the solar energy facility as it is generated;
- Timed release of the stored excess electrical output from the BESS to the national grid when the capacity is required;
- Maintenance of the solar facility, including washing of panels; and
- Maintenance of the distribution line servitude including service road.

In the event of decommissioning, the main aim would be to return the land to its original, pre-construction condition. Should the unlikely need for decommissioning arise (i.e. if the actual SEF becomes outdated or the land needs to be used for other purposes), the decommissioning procedures will be undertaken in line with the EMPr and any legislation or guidelines relevant at the time and the site will be rehabilitated and returned to its pre-construction state. Possible decommissioning activities will include removing the infrastructure, and covering the concrete footings with soil to a depth sufficient for the re-growth of natural vegetation. Any other supporting infrastructure no longer in use will be removed from the site and either disposed of at a registered disposal facility or recycled if possible. Used and/or damaged batteries will be recycled or appropriately disposed of as far as possible.

It should be noted that a detailed project description (based on the conceptual design) is provided in Section A of the BA Report.

2.1 AUTHORS OF THE EMPr

This EMPr has been compiled by the Environmental Assessment Practitioners and the various specialists on the team, and subsequently updated by Savannah Environmental (Pty) Ltd (2020) (as indicated in Table 2). The details and expertise (including the Curriculum Vitae) of the Environmental Assessment Practitioners and the specialists are respectively provided in Appendix H and Appendix D of the BA Report.

Ethanne Soar: holds a BScHONS (Geography and Environmental Science - With Distinction; University of Pretoria) and a BSc (Environmental Science – With Distinction; University of Pretoria). His BScHONS thesis involved a socio-spatial risk assessment and analysis of fortress conservation approaches to address rhino poaching in the context of two private and two public nature reserves in south Africa. Currently Ethanne is studying an MSc (Environmental Management) at the University of Pretoria which he plans to complete by the end of 2020.

Ethanne has worked as an Independent Environmental Consultant in 2019 for BECs (Pty) Ltd, where he was involved in conducting Environmental Authorisation Applications (NWA, NEMA, MPRDA, IWWMP), Public Participation Processes, Ground and Surface Water Quality Sampling, Stormwater Management Plans, Bathometric Assessments, Environmental Compliance Auditing and inspections on a weekly and monthly basis, Environmental Impact Assessments, Basic Assessments, GIS Specialisation, Risk Assessments, Planned Task Observations, IWUL Audit Reports, Quarterly Water Quality Status Reports, Extensive ECO Work, Game and Veld management and lastly Training Courses in: AcGIS (Offered by ESRI), ASPASA Environmental Conference and the Minerals Council Meeting/Workshop (Water Conservation and Demand Management Self-Assessment Tool Training).

Jo-Anne Thomas. She holds a Master of Science Degree in Botany (M.S.c Botany) from the University of the Witwatersrand and is registered as a Professional Natural Scientist (400024/2000) with SACNASP and a registered Environmental Assessment Practitioner (EAP) with EAPASA (2019/726). She has over 20 years of

experience in the field of environmental assessment and management, and the management of large environmental assessment and management projects. During this time, she has managed and coordinated a multitude of large-scale infrastructure EIAs and is also well versed in the management and leadership of teams of specialist consultants, and dynamic stakeholders. She has been responsible for providing technical input for projects in the environmental management field, specialising in Strategic Environmental Advice, EIA studies, environmental permitting, public participation, EMPs and EMPrs, environmental policy, strategy and guideline formulation, and integrated environmental management (IEM). Her responsibilities for environmental studies include project management, review and integration of specialist studies, identification and assessment of potential negative environmental impacts and benefits, and the identification of mitigation measures, and compilation of reports in accordance with applicable environmental legislation.

Table 2: The BA Management Team

NAME	ORGANISATION	ROLE/STUDY TO BE UNDERTAKEN
Environmental Assessment Practitioners		
Paul Lochner	CSIR	Project Leader (EAPSA)
Surina Laurie	CSIR	Project Manager (*Pr. Sci. Nat.)* (Appointed EAP)
Rohaida Abed	CSIR	Technical Advisor and Quality Assurance (*Pr. Sci. Nat.*)
Babalwa Mqokeli	CSIR	Project Officer (*Cand. Sci. Nat.*); GIS
Specialists		
Johann Lanz	Private	Soils and Agricultural Impact Assessment
Reinier Terblanche	Anthene Ecological cc	Ecological Impact Assessment (including Terrestrial and Aquatic Ecology)
Chris van Rooyen	Chris van Rooyen Consulting	Avifauna Impact Assessment
Dr Johnny van Schalkwyk	Private	Heritage Impact Assessment (Archaeology and Cultural Landscape)
Dr Francois Durand	Private	Palaeontological Impact Assessment
Rudolph du Toit	Applied Science Consulting	Social Impact Assessment
Henry Holland	Private	Visual Impact Assessment
Christo Bredenhann	WSP	Review of the Traffic Impact Statement compiled by the CSIR
Savannah Environmental (Pty) Ltd		
Ethanne Soar	Savannah Environmental (Pty) Ltd	Environmental Assessment Practitioner and GIS Specialist
Jo-Anne Thomas	Savannah Environmental (Pty) Ltd	Director & Environmental Assessment Practitioner

2.2 IMPACTS IDENTIFIED DURING THE BA PROCESS

Based on the specialist studies, the following main direct potential impacts, as indicated in Table 3, have been identified and appropriate management and mitigation measures included within the EMPr (where required) as per the recommendations made in the specialist studies to ensure the potential impacts are suitably addressed and managed during all phases of the project. Indirect and cumulative impacts are noted in Sections 4 to 12 of this EMPr. It should be noted that other impacts for which specialist studies were not undertaken but where mitigation or management actions may be required, are also included in the EMPr.

No new listed activities have been identified to be associated with the amendment of the project description to include the BESS. As a result, the impacts identified during the Environment Impact Assessment of Vryburg Solar 3 remain unchanged and applicable for the proposed amendment.

Table 3: Impacts Identified in the BA

KEY IMPACT	IMPACTS IDENTIFIED
Soils and Agricultural	**Construction Phase:** ▪ Loss of agricultural land use. ▪ Soil Degradation. **Operational Phase:** ▪ Loss of agricultural land use. ▪ Generation of alternative land use income. **Decommissioning Phase:** ▪ Loss of agricultural land use. ▪ Soil Degradation.
Terrestrial Ecology and Aquatic Ecology	**Construction Phase:** ▪ Loss of habitat owing to the removal of vegetation at the proposed photovoltaic facility. ▪ Loss of sensitive species (Threatened, Near-Threatened, Rare, Declining or Protected species) during the construction phase. ▪ Loss of connectivity and conservation corridor networks in the landscape. ▪ Contamination of soil during construction in particular by hydrocarbon spills. ▪ Disturbance and killing of vertebrate fauna during the construction phase. **Operational Phase:** ▪ Continued loss of indigenous vegetation to poor recovery of vegetation at the proposed photovoltaic facility. ▪ Exotic vegetation invasion as a consequence of low level but regular and continued disturbance of habitat along the distribution line route. ▪ Alteration of vegetation community structure through maintenance operations around the distribution line. **Decommissioning Phase:** ▪ Poor recovery of habitat owing to clearance of site. ▪ Exotic weed invasion as a consequence of clearance or disturbance in the area where the development was located. ▪ Recruitment and behavioural change in fauna. ▪ Contamination of soil during decommissioning.

KEY IMPACT	IMPACTS IDENTIFIED
	▪ A reversion to the present seral stage, where continued grazing will arise.
Avifauna	**Construction Phase:** ▪ Avifauna displacement due to disturbance caused by the construction activities associated with the solar panels and associated infrastructure, and construction of the distribution line. **Operational Phase:** ▪ Displacement due to habitat transformation caused by the solar panels and associated infrastructure. ▪ Mortality due to collisions with the solar panels. ▪ Mortality due to entrapment between perimeter fences. ▪ Bird collisions with the distribution line. ▪ Electrocution of birds on distribution line, internal 33kV powerlines and possibly within the on-site substation. ▪ Bird nesting on distribution line. **Decommissioning Phase:** ▪ Displacement due to disturbance caused by the de-commissioning activities associated with the solar panels and associated infrastructure.
Heritage (Archaeology and Cultural Landscape)	**Construction Phase:** ▪ Destruction of archaeological resources as a result of the construction activities. ▪ Potential impacts to graves. ▪ Alteration of the cultural and natural landscape as a result of the construction activities. **Operational Phase:** ▪ Alteration of the cultural and natural landscape as a result of the existence and maintenance of the proposed distribution line. **Decommissioning Phase:** ▪ Impacts to the cultural landscape as a result of the removal of the proposed distribution line and on-site substation.
Palaeontology	**Construction Phase:** ▪ Potential loss of palaeontological heritage resources through disturbance, damage or destruction of fossils and fossil sites through surface clearance and excavation activities during the construction phase. • Destruction of palaeontological material as a result of the construction of the proposed distribution line. **Operational Phase:** ▪ Potential impact on the underlying rocky, potentially fossiliferous surface as a result of maintenance activities associated with PV facility, powerlines and underground cables.
Visual	**Construction Phase:** ▪ Potential visual intrusion of construction activities on existing views of sensitive visual receptors in the surrounding landscape. ▪ Potential visual intrusion of a large area cleared of vegetation on existing views of sensitive visual receptors in the surrounding landscape. **Operational Phase:** ▪ Potential landscape impact of a large solar energy facility on a peri-urban landscape.

KEY IMPACT	IMPACTS IDENTIFIED
	▪ Potential visual intrusion of a large solar field and electrical infrastructure on the existing views of sensitive visual receptors. ▪ Visual impact of night lighting of the proposed development on the relatively dark rural nightscape. **Decommissioning Phase:** ▪ Potential visual intrusion of decommissioning activities on existing views of sensitive visual receptors.
Socio-Economic	**Construction Phase:** ▪ Disruption of local social structures as a result of the construction work force and in-migration of job seekers for the construction period. ▪ Increased burden on existing social and bulk services as a result of workforce and job seeker influx. ▪ Temporary employment creation from the estimated 40 to 50 skilled jobs and 200 to 250 unskilled jobs over the construction period. ▪ Unrealistic expectations regarding local job creation, with associated discontent and potential negativity towards the proposed development. ▪ Development of locally-owned support industries to respond to construction-related activities. ▪ Increased risky social behaviour (including but not limited to sex work, transgenerational sex, and drug abuse) associated with increased levels of disposable income within a cash-poor, high unemployment rate. ▪ Damage to farm property/loss of livestock due to negligent and/or criminal behaviour by members of the construction work force. **Operational Phase:** ▪ Establishment of a Community Trust. ▪ Potential loss of farmland due to the construction of the proposed solar energy facility. **Decommissioning Phase:** ▪ Loss of local employment and income as a result of the proposed project being decommissioned.

3 APPROACH TO PREPARING THE EMPr

3.1 COMPLIANCE WITH RELEVANT LEGISLATION

In terms of legal requirements, a crucial objective of the EMPr is to satisfy the requirements of Section 24N of the NEMA, as amended, and Appendix 4 of the amended NEMA EIA Regulations published in Government Notice No. R 326 of 7 April 2017. These regulations regulate and prescribe the content of the EMPr and specify the type of supporting information that must accompany the submission of the report to the authorities. An overview of where the requirements are addressed in this EMPr is presented in Tables 4 and 5.

Table 4: Compliance with Section 24N of NEMA

Requirements of Section 24N of NEMA	Where it is included in this EMPr?
2) The environmental management programme must contain- a) information on any proposed management, mitigation, protection or remedial measures that will be undertaken to address the environmental impacts that have been identified in a report contemplated in subsection 24(1A), including environmental impacts or objectives in respect of: (i) planning and design; (ii) pre-construction and construction activities; (iii) the operation or undertaking of the activity in question; (iv) the rehabilitation of the environment; and (v) closure, if applicable;	Section 1.3 and the columns detailing the impact description, mitigation and management objectives, and mitigation and management actions in Sections 4 to 12 of this EMPr.
b) details of- (i) the person who prepared the environmental management programme; and (ii) the expertise of that person to prepare an environmental management programme;	Section 1.2 of this EMPr and Appendix A of the BA Report
c) a detailed description of the aspects of the activity that are covered by the environmental management programme;	Section 1 and Section 1.1
d) information identifying the persons who will be responsible for the implementation of the measures contemplated in paragraph (a);	Columns in Section 4 to 12 of the EMPr regarding the monitoring responsibility, including the requirements for monitoring and reporting on compliance and the responsible parties noted in Section 3.
e) information in respect of the mechanisms proposed for monitoring compliance with the environmental management programme and for reporting on the compliance;	The columns detailing the mitigation and management actions, and the monitoring methodology, frequency and responsibility in Sections 4 to 12 of this EMPr.
f) as far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and	Sections 4 to 12 of this EMPr, as applicable to the post-construction, rehabilitation phase and the decommissioning phase.
g) a description of the manner in which it intends to- (i) modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) remedy the cause of pollution or degradation and migration of pollutants; and (iii) comply with any prescribed environmental management standards or practices.	The columns detailing the mitigation and management objectives, mitigation and management actions, and the monitoring methodology, frequency and responsibility in Sections 4 to 12 of this EMPr.
3) The environmental management programme must, where appropriate-	The columns detailing the mitigation and management actions, and the monitoring

Requirements of Section 24N of NEMA	Where it is included in this EMPr?
a) set out time periods within which the measures contemplated in the environmental management programme must be implemented; b) contain measures regulating responsibilities for any environmental damage, pollution, pumping and treatment of polluted or extraneous water or ecological degradation which may occur inside and outside the boundaries of the operations in question; and c) develop an environmental awareness plan describing the manner in which- (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment.	methodology, frequency and responsibility in Sections 4 to 12 of this EMPr. Section 11 of this EMPr includes an Environmental Awareness Plan.
5) The Minister, the Minister responsible for mineral resources or an MEC may call for additional information and may direct that the environmental management programme in question must be adjusted in such a way as the Minister, the Minister responsible for mineral resources or the MEC may require.	Not applicable at this stage.
6) The Minister, the Minister responsible for mineral resources or an MEC may at any time after he or she has approved an application for an environmental authorisation approve an amended environmental management programme.	Not applicable at this stage.
7) The holder and any person issued with an environmental authorisation- a) must at all times give effect to the general objectives of integrated environmental management laid down in section 23; b) must consider, investigate, assess and communicate the impact of his or her prospecting or mining on the environment; c) must manage all environmental impacts (i) in accordance with his or her approved environmental management programme, where appropriate; and (ii) as an integral part of the prospecting or mining, exploration or production operation, unless the Minister responsible for mineral resources directs otherwise; d) must monitor and audit compliance with the requirements of the environmental management programme; e) must, as far as is reasonably practicable, rehabilitate the environment affected by the prospecting or mining operations to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and f) is responsible for any environmental damage, pollution, pumping and treatment of polluted or extraneous water or ecological degradation as a result of his or her operations to which such right, permit or environmental authorisation relates.	Throughout the EMPr
8) Notwithstanding the Companies Act, 2008 (Act No. 71 of 2008), or the Close Corporations Act, 1984 (Act No. 69 of 1984), the directors of a company or members of a close corporation are jointly and severally liable for any negative impact on the environment, whether advertently or inadvertently caused by the company or close corporation which they represent, including damage, degradation or pollution.	Section 3 details the responsibility of the Project Applicant.

Table 5: Compliance with Appendix 4 of the 2014 NEMA EIA Regulations (as amended on 7 April 2017)

Requirements of Appendix 4 of the 2014 NEMA EIA Regulations (as amended on 7 April 2017 in GN R326)	Where it is included in this EMPr?
1. (1) An EMPr must comply with section 24N of the Act and include: a) details of: (i) the EAP who prepared the EMPr; and (ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	Section 1.2 of this EMPr and Appendices A and E of the **BA Report**. Appendix H of the **BA Report** includes the Curriculum Vitae of the Environmental Assessment Practitioners and specialists respectively.
b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 1 and Section 1.1
c) a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	Appendix A and Appendix B of this EMPr
d) a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including: (i) planning and design; (ii) pre-construction activities; (iii) construction activities; (iv) rehabilitation of the environment after construction and where applicable post closure; and (v) where relevant, operation activities;	Section 1.3 Page and the columns detailing the impact description, mitigation and management objectives, and mitigation and management actions in Sections 4 to 12 of this EMPr.
e) a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to: (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) comply with any prescribed environmental management standards or practices; (iii) comply with any applicable provisions of the Act regarding closure, where applicable; and (iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	The columns detailing the mitigation and management actions in Sections 4 to 12 of this EMPr.
f) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	The columns detailing the monitoring methodology in Sections 4 to 12 of this EMPr.
g) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	The columns detailing the monitoring frequency in Sections 4 to 12 of this EMPr.
h) an indication of the persons who will be responsible for the implementation of the impact management actions;	The columns detailing the monitoring responsibility in Sections 4 to 12 of this EMPr.
i) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	The columns detailing the mitigation and management actions, and the monitoring methodology and frequency in Sections 4 to 12 of this EMPr.
j) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	The columns detailing the mitigation and management actions, and the monitoring methodology, frequency and responsibility in Sections 4 to 12 of this EMPr.

Requirements of Appendix 4 of the 2014 NEMA EIA Regulations (as amended on 7 April 2017 in GN R326)	Where it is included in this EMPr?
k) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Section 4 to 12 of the EMPr, including the requirements for monitoring and reporting on compliance and the responsible parties noted in Section 3.
l) an environmental awareness plan describing the manner in which: (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Section 11 of this EMPr.
m) any specific information that may be required by the competent authority.	Section 2.2 and the management objectives and management actions in Sections 4 to 11. It should be noted that this is based on previous renewable energy projects and corresponding feedback from the DEFF.
(2) Where a government notice *gazetted* by the Minister provides for a generic EMPr, such generic EMPr as indicated in such notice will apply.	Not Applicable

3.2 COMPLIANCE WITH DEFF REQUIREMENTS

The EMPr is structured in such a way to comply with the requirements of the DEFF and to ensure that the mitigation and management measures that have been identified during the BA Process are included in the respective plans. These requirements are detailed in Table 6 below. It is important to note that other project specific aspects (such as the findings and recommendations of the specialist studies and specialist motivation letters compiled for the Part 2 amendment for the inclusion of the BESS), in addition to those covered by the plans normally required by the DEFF, have been included in Section 12 of the EMPr.

Table 6: DEFF Requirements for the EMPr

DEFF Requirements	Relevant Section in the EMPr
All recommendations and mitigation measures recorded in the BA Report and the specialist studies conducted.	Recommended mitigation measures and monitoring actions as noted in the BA Report and specialist studies have been included in this EMPr, where relevant.
The final site layout map	Refer to Appendix A of this EMPr for the site layout map. Refer to Section 1.1 of this EMPr for a description of the proposed project infrastructure.
Measures as dictated by the final site layout map and micro-siting.	Refer to Appendix A of this EMPr for the site layout map. Refer to Section 1.1 of this EMPr for a description of the proposed project infrastructure and information regarding the final siting of the proposed infrastructure, which will take place during the detailed engineering phase (taking into consideration the findings of the specialists in terms of environmental sensitivity).
An environmental sensitivity map indicating environmental sensitive areas and features identified during the BA Process.	Refer to Appendix B of this EMPr for an environmental sensitivity map. Refer to Section 1.1 of this EMPr for a description of the

DEFF Requirements	Relevant Section in the EMPr
	approach followed to identify the environmental sensitivities.
A map combining the final layout map superimposed (overlain) on the environmental sensitivity map.	Refer to Appendix B of this EMPr for a combined environmental sensitivity and layout map.
An alien invasive management plan to be implemented during the construction and operation of the facility. The plan must include mitigation measures to reduce the invasion of alien species and ensure that the continuous monitoring and removal of alien species is undertaken.	Refer to Section 5 of this EMPr.
A plant rescue and protection plan which allows for the maximum transplant of conservation important species from areas to be transformed. This plan must be compiled by a vegetation specialist familiar with the site and be implemented prior to commencement of the construction phase.	Refer to Section 6 of this EMPr. It should be noted that faunal protection and habitat rehabilitation has also been included in this section.
A re-vegetation and habitat rehabilitation plan to be implemented during the construction and operation of the facility. Restoration must be undertaken as soon as possible after completion of construction activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats.	Refer to Section 6 of this EMPr. It should be noted that faunal protection and habitat rehabilitation has also been included in this section.
An open space management plan to be implemented during the construction and operation of the facility.	Refer to Section 7 of this EMPr.
A traffic management plan for the site access roads to ensure that no hazards would result from the increased truck traffic and that traffic flow would not be adversely impacted. This plan must include measures to minimise impacts on local commuters e.g. limiting construction vehicles travelling on public roadways during the morning and late afternoon commute time and avoid using roads through densely populated built-up areas so as not to disturb existing retail and commercial operations.	Refer to Section 8 of this EMPr.
A transportation plan for the transport of components, main assembly cranes and other large pieces of equipment.	Refer to Section 8 of this EMPr.
A storm water management plan to be implemented during the construction and operation of the facility. The plan must ensure compliance with applicable regulations and prevent off-site migration of contaminated storm water or increased soil erosion. The plan must include the construction of appropriate design measures that allow surface and subsurface movement of water along drainage lines so as not to impede natural surface and subsurface flows. Drainage measures must promote the dissipation of storm water run-off.	Refer to Section 9 of this EMPr.
A fire management plan to be implemented during the construction and operation of the facility.	Refer to Section 12 of this EMPr. It should be noted that this has been combined with an Environmental Awareness Plan.
An erosion management plan for monitoring and rehabilitating erosion events associated with the facility. Appropriate erosion mitigation must form part of this plan to prevent and reduce the risk of any potential erosion.	Refer to Section 10 of this EMPr.
An effective monitoring system to detect any leakage or spillage of all hazardous substances during their transportation, handling, use and storage. This must include precautionary measures to limit the	Refer to Section 11 of this EMPr.

DEFF Requirements	Relevant Section in the EMPr
possibility of oil and other toxic liquids from entering the soil or storm water systems	
Measures to protect hydrological features such as streams, rivers, pans, wetlands, dams and their catchments, and other environmental sensitive areas from construction impacts including the direct or indirect spillage of pollutants.	Measures to protect hydrological features such as streams, rivers, pans, wetlands, dams and their catchments have been included throughout the EMPr, such as Sections 9, 10 and 11.

3.3 CONTENTS OF THE EMPr

Where applicable, each section of the EMPr is divided into the following four phases of the project cycle:

- Design Phase;
- Construction Phase;
- Operational Phase; and
- Decommissioning Phase.

The EMPr includes the findings and recommendations of the BA Process and specialists studies. Furthermore, as noted above, the EMPr is considered a "living" document and must be updated with additional information or actions during the design, construction, operational and decommissioning phases if applicable.

The EMPr follows an approach of identifying an over-arching goal and objectives, accompanied by management actions that are aimed at achieving these objectives. The management actions are presented in a table format in order to show the links between the goal and associated objectives, actions, responsibilities, and monitoring requirements and targets.

The management plans for the design, construction, operational and decommissioning phases consist of the following components:

- **Impact:** The potential positive or negative impact of the development that needs to be enhanced, mitigated or eliminated.
- **Objectives:** The objectives necessary in order to meet the goal; these take into account the findings of the specialist studies.
- **Mitigation/Management Actions**: The actions needed to achieve the objectives of enhancing, mitigating or eliminating impacts; taking into consideration factors such as responsibility, methods, frequency, resources required and prioritisation.
- **Monitoring**: The key monitoring actions required to check whether the objectives are being achieved, taking into consideration methodology, frequency and responsibility.

3.4 GOAL FOR ENVIRONMENTAL MANAGEMENT

The overall goal for environmental management for the proposed Vryburg Solar 3 project is to construct and operate the project in a manner that:

- Minimises the ecological footprint of the project on the local environment;
- Minimises impacts on fauna, flora and aquatic ecosystems;
- Facilitates harmonious co-existence between the project and other land uses in the area; and

- Contributes to the environmental baseline and understanding of environmental impacts of SEFs and associated supporting electrical infrastructure in a South African context.

4 ROLES AND RESPONSIBILITIES

For the purposes of the EMPr, the generic roles that need to be defined are those of the:

- Project Developer;
- Environmental Control Officer;
- Construction Manager (Lead Contractor); and
- Facility Manager.

It is acknowledged that the specific titles for these functions will vary from project to project. The intent of this section is to give a generic outline of what these roles typically require. It is expected that this will be appropriately defined at a later stage.

4.1 PROJECT DEVELOPER

The Project Developer (i.e. Vryburg Solar 3 (Pty) Ltd) is the current 'owner' of the project and, as such, is responsible for ensuring that the conditions of the EA issued in terms of NEMA (should the project receive such authorisation) are fully adhered to, as well as ensuring that any other necessary permits or licences are obtained and complied with. It is expected that the Project Developer at the point of construction will appoint the Environmental Control Officer and the Lead Contractor.

4.2 ENVIRONMENTAL CONTROL OFFICER

An independent Environmental Control Officer (ECO) must be appointed to monitor the compliance of the proposed project with the conditions of EA (should such authorisation be granted by the DEFF) are complied with at all times. The ECO must also monitor compliance of the proposed project with environmental legislation and recommendations of the EMPr, as well as oversee the implementation of the EMPr during the phases of the project, monitor environmental impacts, undertake record-keeping.

The ECO will be responsible for updating the EMPr as and when necessary, and compiling a monitoring checklist based on the EMPr. The roles and responsibilities of the ECO should include the following:

- The ECO must undertake periodic environmental audits during the relevant phases of the proposed project in order to monitor and record environmental impacts and non-conformances, and to monitor site activities to ensure adherence to the specifications contained in the EMPr, using a monitoring checklist. The timeframes for environmental audits will be indicated in the EA (should such authorisation be granted by the DEFF).
- Environmental compliance/audit reports must be compiled and submitted by the ECO to the Competent Authority (i.e. DEFF and/or Provincial Department of Environment and Nature Conservation) on a regular basis (i.e. at intervals as indicated in the EA (should such authorisation be granted by the DEFF).
- The ECO must maintain a diary of site visits and audits, a copy of the Environmental Authorisation (should such authorisation be granted by the DEFF) and relevant permits for reference purposes, a non-

conformance register, a public complaint register, and a copy of previous environmental audits undertaken.

- Prior to the commencement of construction, the ECO must meet on site with the Contractor to confirm the construction procedure and designated construction areas and work activity zones.
- Reporting of any non-conformances within 48 hours of identification of such non-conformance to the relevant agents.
- Conducting an environmental inspection on completion of the construction period and 'signing off' the construction process with the Contractor.
- Ensure that records are kept of all monitoring activities and results.
- Conducting an environmental inspection on completion of decommissioning and 'signing off' the site rehabilitation process.
- The ECO must undertake periodic environmental audits during the relevant phases of the proposed project in order to monitor and record environmental impacts and non-conformances, and to monitor site activities to ensure adherence to the specifications contained in the EMPr, using a monitoring checklist. The timeframes for environmental audits will be indicated in the EA (should such authorisation be granted by the DEFF).
- Environmental compliance/audit reports must be compiled and submitted by the ECO to the Competent Authority (i.e. DEFF and/or the relevant provincial environmental departments) on a regular basis (i.e. at intervals as indicated in the EA (should such authorisation be granted by the DEFF).
- The ECO must maintain a diary of site visits and audits, a copy of the EA (should such authorisation be granted by the DEFF) and relevant permits for reference purposes, a non-conformance register, a public complaint register, and a copy of previous environmental audits undertaken.
- Prior to the commencement of construction, the ECO must meet on site with the Contractor to confirm the construction procedure and designated construction areas and work activity zones.
- Reporting of any non-conformances within 48 hours of identification of such non-conformance to the relevant agents.
- Conducting an environmental inspection on completion of the construction period and 'signing off' the construction process with the Contractor.
- Ensure that records are kept of all monitoring activities and results.
- Conducting an environmental inspection on completion of decommissioning and 'signing off' the site rehabilitation process.

The Lead Contractor and sub-contractors may have their own Environmental Officers, or designate Environmental Officer functions to certain personnel.

4.3 CONSTRUCTION MANAGER

The Construction Manager will be responsible for the following:

- Ensure that all appointed contractors and sub-contractors are aware of the EMPr and their respective responsibilities;
- Prior to the commencement of construction, the Construction Manager must meet on site with the ECO in order to confirm the construction procedure and designated construction areas and work activity zones.
- Ensure that each sub-contractor employs an Environmental Officer (or employs a designated suitably qualified individual to fulfil the role of an Environmental Officer) to monitor and report on the daily activities on-site during the construction period;

- Implementation of the overall construction programme, project delivery and quality control for the construction for the proposed electrical grid infrastructure project;
- Overseeing compliance with the Health, Safety and Environmental Responsibilities specific to the project management related to project construction;
- Promoting total job safety and environmental awareness by employees, contractors and sub-contractors and stress to all employees and contractors and sub-contractors the importance that the project proponent attaches to safety and the environment;
- Ensuring that safe, environmentally acceptable working methods and practices are implemented and that sufficient plant and equipment is made available properly operated and maintained, to facilitate proper access and enable any operational to be carried out safely;
- Ensuring that all appointed contractors and sub-contractors repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in the EMPr, to the satisfaction of the Project Developer's ECO;
- Implement the Traffic Management Plan (Section 8), Transportation Plan (Section 8) and Storm Water Management Plan (Section 9).

5 ALIEN INVASIVE VEGETATION MANAGEMENT PLAN

Impact	Mitigation/ Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
A. DESIGN PHASE					
5.1. Impacts due to the establishment and increases in the occurrence of exotic or alien invasive plant species.	Ensure the appropriate removal of alien invasive plants and prevent the spread of alien and invasive species within the project area.	5.1.1. Ensure compliance with relevant Environmental Specifications (amendments to the regulations under the Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA) and Section 28 of the NEMA) for the control and removal of alien invasive plant species. 5.1.2. Seek guidance from a suitably qualified specialist or contact relevant authorities on the removal of the alien vegetation on site. 5.1.3. Compile an alien and invasive control plan for the proposed project site to ensure that these species are eradicated and controlled to prevent their spread beyond the project footprint. Alien plant seed dispersal within the top layers of the soil within footprint areas, that will have an impact on future rehabilitation, has to be controlled.	» Ensure that this is done and taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports. » Appoint a suitable specialist/ contractor or contact the relevant authorities to seek guidance on the removal of alien invasive species. » Appoint a suitable specialist to compile an alien invasive vegetation eradication plan. » Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.	» Once-off during the design phase. » Once-off during the design phase (i.e. prior to commencement). » Once-off during the design phase. » Once-off during the design phase.	» Project Developer » Project Developer and ECO » Project Developer » ECO

Impact	Mitigation/ Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
B. CONSTRUCTION PHASE					
5.2. An increased infestation of exotic or alien invasive plant species owing to clearance or disturbance for development.	Reduce the opportunity for invasive plant material to establish on site due to project activities.	5.2.1. Appoint a suitable specialist or contractor to undertake a sweep and survey of the final development footprint site, with an alien invasive eradication team to remove exotic vegetation prior to the commencement of construction. 5.2.2. Establish an ongoing monitoring programme for the construction phase to detect and eradicate any alien invasive species that may establish, in particular species such as *Prosopis glandulosa* (Honey Mesquite) that should not be allowed to establish. 5.2.3. Identify any exotic plant material in the fill material and remove and dispose. Monitor the point of infilling and address any emergent exotic plant material.	» Appoint a suitable vegetation contractor to inspect the site and remove any exotic weeds prior to the commencement of construction. » Ensure that continued monitoring and eradication of alien invasive plant species is undertaken. » Monitor the source of fill material, the importing of such material to the construction site, the presence of alien invasive plants in the fill material, as well as recurrence of these species in the area of infilling during the construction phase via visual inspections and take action to remove and control these species.	» Prior to the commencement of construction. » Ongoing during the construction phase. » Ongoing during the construction phase.	» Project Developer, ECO, and Specialist/ Contractor » ECO and Contractor » ECO and Contractor
5.3. Increased presence of exotic and disturbance driven plant species. With increasing levels of anthropogenic activity on site and within the	Reduce the opportunity for invasive plant material to establish on site as a result of increased anthropogenic activity.	5.3.1. Implement vegetation management and conservation initiatives, such as control of exotic vegetation, and avoid unnecessary disturbance to the ground which promotes exotic	» Undertake site and visual inspections and report any non-compliance. » Rehabilitate disturbed areas and monitor the presence of alien invasive species on site.	» On-going » On-going » On-going » On-going » As necessary during the	» ECO and Contractor » ECO and Contractor » ECO and Contractor

Impact	Mitigation/ Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
surrounding area, the propensity for plant invasion or the dominance of species that are tolerant of higher levels of disturbance will result in such species dominating and perhaps ousting other less tolerant species. This is a cumulative impact.		weed invasion and vegetation change. 5.3.2. Undertake rehabilitation of disturbed areas as soon as possible after construction. Stockpile the shallow topsoil layer separately from the subsoil layers. Reinstate the topsoil layers (containing seed and vegetative material) when construction is complete to allow the plants to rapidly re-colonise the bare soil areas. 5.3.3. Keep clearance and disturbance of indigenous vegetation to a minimum. 5.3.4. Ensure that alien invasive vegetation found on site, within the proposed project footprint, is immediately controlled and removed promptly, in a scheduled manner throughout the construction phase. The removal of alien vegetation on site during the construction phase should use registered control methods and take into consideration the Alien and Invasive Species Regulations published in terms of Section	» Monitor and manage vegetation clearing by undertaking visual inspections to ensure minimal disturbance and to restrict activities to within demarcated areas. » Monitor the presence of alien invasive plants during the construction phase via visual inspections and take action to remove and control these species. If any alien invasive species are detected then these should be cleared from site. » Monitor the removal of the alien vegetation found on site via visual inspections. » Clean machinery and equipment prior to the construction phase. ECO to conduct inspections and report any non-compliance.	construction phase. » Prior to the commencement of construction, and as necessary during the construction phase.	» ECO and Contractor » ECO » ECO and Contractor

Impact	Mitigation/ Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		97(1) of the NEM: BA, if applicable. 5.3.5. The removed alien invasive vegetation should be immediately disposed at a suitable waste disposal facility and should not be kept on site for prolonged periods of time, as this will enhance the spread of these species. 5.3.6. All construction machinery and plant equipment delivered to site for use during the construction phase should be cleaned in order to limit the introduction of alien species.			
C. OPERATIONAL PHASE					
5.4. Increased spread and introduction of alien invasive vegetation as a result of the movement of vehicles within the study area, particularly along the distribution line and service road, which may change or alter the local ecology.	To prevent the excessive growth and spread of alien invasive species on disturbed lands that form part of the PV facility (including the BESS footprint). Reduce the establishment and spread of alien invasive plants. To remove alien invasive species as and when	5.4.1. Continue with on-going monitoring programme to detect and quantify any alien species that may become established and identify the highly invasive species during the operation phase. 5.4.2. Review the vegetation composition around the project site. 5.4.3. Undertake removal of alien invasive vegetation using	» Carry out inspections to monitor the presence of alien invasive vegetation, and the level of disturbance, as well as the implementation of interventions. » Undertake annual routine weed control. » Monitor the use of herbicide sprays for removal of alien vegetation by undertaking visual inspections and	» Monthly	» Project Developer

Impact	Mitigation/ Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
	they may arise and thereby prevent alteration of local and adjacent habitat forms.	approved and appropriate herbicides. 5.4.4. Implement management actions in Section 4.3 above as applicable.	reporting any non-compliance. » Maintain register of weed spraying activities and ensure that herbicide use is recorded.		
D. DECOMMISSIONING PHASE					
5.5. Increased infestation of exotic or alien invasive plant species as a result of disturbance where the development footprint took place.	To prevent the excessive growth and spread of exotic or alien invasive species on disturbed lands that formed a portion of the proposed PV facility (including the BESS footprint) and electrical infrastructure.	5.5.1. All natural areas must be rehabilitated with species indigenous to the area. Re-seed with locally-sourced seed of indigenous grass species that were recorded on site pre-construction. 5.5.2. Exotic weed control measures to be instituted through weed control programme. Regular redress of exotic weed through the use of herbicides. 5.5.3. Ensure the stabilization of site, once decommissioning and removal of infrastructure has arisen. 5.5.4. Implement management actions in Section 4.3 above for the decommissioning phase, as applicable.	» Undertake weed eradication according to a weed eradication programme, along disturbance sites following dismantling of structures. » Monitor newly disturbed areas where infrastructure has been removed to detect and quantify any aliens that may become established after decommissioning and rehabilitation. » Implement monitoring methodology in Section 4.3 above for the decommissioning phase, as applicable. » Final external audit of area to confirm that area is rehabilitated to an acceptable level.	» Once-off » During the decommissioning phase » During the decommissioning phase » Implement monitoring frequency in Section 4.3 above for the decommissioning phase, as applicable. » Once off	» Project Developer and ECO » Project Developer and ECO » Project Developer / Contractor » Implement monitoring responsibility in Section 4.3 above for the decommissioning phase, as applicable. » Facility Manager

Impact	Mitigation/ Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
					with advice from specialist

6 PLANT RESCUE AND PROTECTION PLAN INCLUDING RE-VEGETATION AND HABITAT REHABILITATION PLAN (INCLUDING AQUATIC ECOLOGY, FRESHWATER RESOURCES, AND TERRESTRIAL AND AQUATIC FAUNA AND FLORA)

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	*Frequency*	*Responsibility*
A. DESIGN PHASE					
6.1. Destruction of moderately sensitive vegetation.	Avoidance of unnecessary disturbance to the site and surrounds, and to establish buffers where required.	6.1.1. Consider the most applicable access road and site layout, and ensure that sensitive habitats are clearly demarcated as no-go areas during the project planning stage.	» Verify that this is undertaken by reviewing the signed approved designs.	» Once-off	» Project Developer and ECO
6.2. Alteration of surface water quality on account of construction activities that lead to change in water chemistry.	To reduce the potential of contamination of soils and local water resources and change in ecological structure. To ensure that as far as possible all infrastructure is placed outside of water resource areas and their respective buffer zones.	6.2.1. Ensure that as far as possible all infrastructure is placed outside of water resource areas and their respective buffer zones. 6.2.2. Careful planning of the location of the infrastructure. The applicable zone of regulation around the freshwater resources in terms of NEMA is 32 m, and this must be adhered to, in order to assist in minimising impacts on the freshwater resources in close proximity to the proposed PV facility.	» Ensure that the 32m zone of regulation is taken into consideration in the final layout of the proposed PV facility. Ensure that this is taken into account, where possible and as feasible, and that the recommended mitigation measures are implemented as required.	» Once-off prior to the commencement of construction.	» Project Developer and ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
6.3. Loss of Species of Special Concern (SSC)	Minimise fragmentation and loss of SSC and protected species and their habitats through the careful siting and layout planning for the project.	6.3.1. Avoid the removal of listed SSC and protected species as far as possible.	» Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.	» Once-off during the planning and design phase	» Project Developer
6.4. Habitat transformation as a result of the construction and operation of the solar facility and associated infrastructure, resulting in displacement of avifauna.	To reduce the negative impacts associated with the loss of natural vegetation.	6.4.1. The recommendations of the ecological specialist study must be strictly implemented, especially as far as limitation of the construction footprint, the retention of natural vegetation and rehabilitation of transformed areas is concerned. 6.4.2. Areas with large trees (as shown in Appendix B) should be retained as much as possible as they serve as potential roosting and breeding habitat for a variety of birds, including raptors. In instances where the removal of trees cannot be avoided, e.g. in the powerline servitude,	» Ensure that this is taken into consideration during the planning and design phase.	» Once during the design and planning phase	» Project Developer and Contractor

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		the minimum number of trees should be removed in order to meet the legal and safety requirements.			
6.5. Impact on avian behavior and avian species as a result of collision with infrastructure of the PV facility and associated electrical infrastructure.	To reduce impact on avifauna	6.5.1. Establish Bird Flight Diverter (BFDs) across powerlines at appropriate points for the entire length of the line. 6.5.2. Vulture friendly structures must be employed for the 132 kV distribution line. 6.5.3. Employ the alternative option of placing the 33 kV lines underground, as per the recommendation from the Avifauna Specialist.	» Ensure that this is taken into consideration during the planning and design phase.	» Once during the design and planning phase.	» Project Developer and Contractor
B. CONSTRUCTION PHASE					
6.6. Excessive loss of natural vegetation in and outside the development footprint area and veld degradation.	Reduce points of vegetation clearance and unnecessary clearance of vegetation.	6.6.1. The Contractors and construction personnel must be made aware that indigenous vegetation must not be removed or damaged. 6.6.2. Sensitive habitats and areas outside of the project development area should be clearly demarcated as no go areas during the construction phase to avoid accidental impacts.	» Carry out Environmental Awareness Training. » Strict control over the behavior of construction workers, restricting activities to within demarcated areas for construction. » Appoint a suitable contractor to complete the	» Once-off training and ensure all staff are inducted » Ongoing » Prior to commencement of construction and search and rescue. » Once-off prior to construction. » Once-off prior to construction and implementation	» Project Developer, Construction Manager and ECO » Project Developer, Construction Manager and ECO » Project Developer, Search and Rescue

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		6.6.3. Undertake a site review and fauna and plant search and rescue prior to the commencement of the construction phase, and possible removal/relocation of flora and fauna of value within the affected site (i.e. such specimens may be relocated/removed or avoided (with the relevant permits and approvals in place)). 6.6.4. Ensure the necessary permits or licences are identified and applied for as applicable for removal of protected, indigenous vegetation. Await response and provision of permit (as required) from the relevant Authorities prior to the removal of the indigenous species (if required). Once these permits are obtained, search and rescue must be undertaken for the indigenous species. Efforts should be made to	search and rescue. Identify the plants that may need to be relocated or rescued. Contact the relevant Authorities if any protected species are found during the search and rescue. Review permits prior to undertaking search and rescue. Ensure that this is taken into consideration by reviewing signed minutes of meetings or signed reports. » Ensure that a suitable specialist is appointed to compile a Vegetation Rehabilitation Plan. » Verify that the proposed project construction area is determined and outlined prior to the	during construction. » Once-off prior to construction. » Once-off prior to construction. » Once-off prior to construction. » Once-off prior to construction.	Contractor, and ECO » Project Developer and ECO » Project Developer and ECO » ECO » Project Developer, Construction Manager, ECO and Ecologist » Project Developer and ECO » Project Developer and ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		minimise impacts on protected trees (if any) by avoiding areas where such species may occur. 6.6.5. Ensure that demarcation of the construction area is undertaken prior to the commencement of construction and that it is maintained throughout. Fencing of the site is an option for containment. In this regard, conduct a survey of the work space around the proposed PV facility. 6.6.6. Ensure that existing access roads are used as far as possible, and adequately routed and identified prior to the construction phase. Ensure that they are clearly demarcated for use throughout the construction phase. Access roads should be surveyed prior to the construction of the proposed power line towers and follow routes that avoid unnecessary	commencement of the construction phase by reviewing signed minutes of meetings or signed reports. » Verify that the proposed access routes are determined and outlined prior to the commencement of the construction phase by reviewing signed minutes of meetings or signed reports. Ensure that vegetation removal is kept to a minimum by reviewing and contributing to the approved site plan.		

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		large scale clearance of vegetation and avoid sensitive habitats.			
6.7. Removal of sensitive species.	To reduce negative impacts on and loss of indigenous vegetation and protected/threatened species.	6.7.1. Appoint a specialist to undertake a second review and site visit of the final layout of the development footprint, possibly during the late summer period, in order to identify any plant species on site that may require "rescue" as well as any exotic weeds/vegetation that require removal. 6.7.2. A plant rescue operation must be initiated to confirm that no other species are located within the development site. 6.7.3. Avoid the removal of listed SSC or protected species as far as possible. Should any of the listed/protected species need to be removed, the requisite permits must be obtained prior to the removal of the species	» Appoint an Ecologist to oversee the final development footprint area through a reconnaissance survey. » ECO must undertake a final walkthrough of the site prior to commencement of construction to ensure no Species of Special Concern will be impacted on. » Monitor activities and record and report non-compliance.	» Prior to the commencement of construction » Ongoing	» Project Developer, Specialist and ECO » ECO and Contractor » ECO and Contractor

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
6.8. The disturbance/displacement of fauna and loss of vegetation/habitat through anthropogenic activities, disturbance of refugia and general change in habitat.	To reduce change in faunal populations and faunal ethos within the region and/associated development area.	6.8.1. Conduct an Environmental Awareness Training and induction for all construction staff and personnel. 6.8.2. Undertake survey of development footprint prior to the construction phase, taking measures to avoid more sensitive terrain. 6.8.3. A pre-construction site walk through should be undertaken shortly before commencement o construction in order t identify any important faun communities that may have relocated to the development footprint an line route. 6.8.4. Prior to construction, an avifaunal specialist should conduct a site walkthrough, covering the final power line route, to identify any nests/breeding/roosting activity of Red List species, the results of which may inform the final	» Carry out Environmental Awareness Training with a discussion on the management of terrestrial fauna and flora on site. » Appoint a suitably qualified Ecologist to conduct a pre-construction survey of the final site and development footprint. » The specific impact of construction on these species should be noted and the possibility of relocation of species may be considered. » Ensure that this is taken into consideration by reviewing signed minutes of meetings or signed reports. » Appoint a suitable contractor to	» Once-off, prior to construction. » Once-off, prior to construction. » Once-off, prior to construction. » Once-off, prior to construction. » At commencement » Prior to commencement of construction and search and rescue. » Prior to commencement of construction and search and rescue. » Once-off, prior to construction. » Once-off, prior to construction.	» ECO and Contractor » Project Developer, Construction Manager, ECO and Ecologist » Project Developer, Construction Manager, ECO and Ecologist » Project Developer, Search and Rescue Contractor, and ECO » Project Developer and Ornithologist » Project Developer and ECO » Project Developer and ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		construction schedule in close proximity to that specific area, including abbreviating construction time where possible, scheduling activities around avian breeding and/or movement schedules where possible, and lowering levels of associated noise. 6.8.5. Undertake plant search and rescue operations within the affected site, where such specimens may be relocated/removed or avoided (with the relevant permits and approvals in place). 6.8.6. Ensure that demarcation of the construction area is undertaken prior to the commencement of construction and that it is maintained throughout (i.e. containment of construction and laydown areas).	complete the search and rescue. Identify the plants that may need to be relocated or rescued. » Appoint a suitably qualified Ornithologist to conduct a pre-construction survey of the construction corridor. » Contact the relevant Authorities if any protected species are found during the search and rescue. Review permits prior to undertaking search and rescue. Ensure that this is taken into consideration by reviewing signed minutes of meetings or signed reports. » Verify that the proposed project		

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
			construction area is determined and outlined prior to the commencement of the construction phase by reviewing signed minutes of meetings or signed reports.		
6.9. Impact on fauna leading to ecosystem change due to direct faunal mortalities as a result of construction activities such as traffic movement and general disturbance on site.	To reduce the risk to fauna in respect of activities within construction footprints and activities that may arise in and around construction areas.	6.9.1. Ensure proper management of traffic movement and construction labour conduct is implemented. The construction personnel and staff should be made aware of the possible presence of fauna within the proposed project area. The construction personnel and staff must also be made aware of the general speed limits on site and must be alert at all times for potential crossings. 6.9.2. Develop protocols in respect of management of wildlife within and adjacent to construction sites.	» Carry out Environmental Awareness Training with a discussion on the management of terrestrial fauna and flora on site, and traffic movement in this regard. Place signage to inform and educate the construction staff regarding this. » Conduct audits of the signed attendance registers. » Place signage to inform and educate the construction staff	» Once-off training and ensure that all new staff are inducted. » Monthly » Intermittent during the construction phase	» Contractor/ECO » ECO » Project Developer, Contractor and ECO » Contractor and ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		6.9.3. Undertake pre operations assessment of the construction site to identify the presence of fauna within work areas. Address and relocate any fauna identified. Establish a recording method in order to monitor the construction activities, including species presence within site, mortalities and sitings.	regarding the management of terrestrial fauna and flora on site. » Undertake inspections of the construction site to verify the presence of fauna, monitor mortalities and identify the cause if encountered, as well as to relocate the identified fauna (if applicable).		
6.10. Change in habitat form and structure as a result of alteration of surface hydrology due to hardpanning of the upper soil horizon (i.e. soil compaction) due to traffic movement within and around the construction area, as well as use of materials to establish a sound working platform (including site levelling and site earthworks).	Reduce changes in surface hydrology associated with construction activities.	6.10.1. Implement ripping of disturbed areas and compacted soils, and create a managed environment. 6.10.2. Implement measures to attenuate or decelerate surface flow, where required.	» Identify areas of compaction and rip or remediate. » Identify changes in surface topography and implement deceleration mechanisms if and where required. Ensure that this is taken into consideration in the Method Statement for	» Ongoing during the construction phase, with a weekly evaluation in response to the commencement and progression of construction work. » As required during the construction phase	» ECO and Contractor » ECO and Contractor

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
This is also linked to a cumulative impact as a result of increased levels of areas dominated by built structures.			Stormwater Management during the construction phase.		
6.11. Change in habitat structure due to general erosion primarily as a result of the movement of construction traffic, earth and plant operations, which causes compaction and surface disturbance.	Reduce the likelihood of excessive erosion arising from construction traffic and plant operations.	6.11.1. Ensure site management and timeous redress of evident wind and water erosion. Identify points of rilling and address through ripping or infilling. 6.11.2. Identify alteration in surface topography and address through sculpting or remediation of surface flow.	» Undertake monitoring of the construction site and access routes to the construction site. Identify points of rilling and implement mechanisms to rectify it, if and where required. Ensure that this is taken into consideration in the Method Statement for Erosion Management during the construction phase. » Identify changes in surface topography and implement sculpting or	» Weekly	» Project Developer, ECO and Contractor

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
			remediation of surface flow, if and where required. Ensure that this is taken into consideration in the Method Statement for Stormwater Management during the construction phase.		
6.12. Impact of solid waste generation on fauna with possible mortalities as a result of potential ingestion or ensnarement. Solid waste (e.g. small bolts, wires etc.) has the potential to harm or kill animals through ingestion or ensnarement.	To reduce the impact of solid waste materials on particular fauna. The containment and disposal of solid waste is required in order to avert behavioural change in local fauna as well as general pollution impacts on terrestrial habitat.	6.12.1. Reduce the amount of material packaging imported to sites. Monitor site for materials (small metallic objects, off cuts, wire etc.) that may be within and around the construction area. 6.12.2. Ensure that waste disposal systems are present on site. 6.12.3. Ensure that waste generated on site is contained in order to prevent access by terrestrial fauna and avifauna. 6.12.4. Remove waste from site on a regular basis, following by	» Conduct audits to ensure that a waste disposal system is compiled and abided by, and updated as required. » Conduct audits to ensure that receptacles for waste are available at all sites of operation and that these are sealed off and contained. Record and report any non-compliance.	» Daily	» Project Developer and ECO » Contractor and ECO » Contractor and ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		safe disposal at a licensed waste disposal facility. 6.12.5. Damaged and used batteries should be removed from site by the supplier or accredited service provider for recycling or appropriate disposal.	» Conduct audits and site inspections to ensure that regular cleaning operations are undertaken on site, and that this includes the clearance of waste materials. Record and report any non-compliance.		
6.13. Changes in ecological processes and vegetation and habitat alteration through the introduction of nutrients and other materials which may impact directly or indirectly on flora and faunal components of region.	Identify points where surface run off and related disposals may arise and reduce potential for change in habitat by identifying habitat form and nature and taking avoidance actions.	6.13.1. Compile and implement a Vegetation Rehabilitation Plan for the construction phase. 6.13.2. Conduct a site survey of the final development footprint prior to construction and identify points of significance or the overall significance of the site. 6.13.3. Containment and demarcation of the construction area, labour workforce and related activities. Construction activities should be confined to the laydown	» Ensure that a suitable specialist is appointed to compile a Vegetation Rehabilitation Plan. Review signed minutes of meetings or signed reports. » Appoint a suitably qualified Ecologist to conduct a pre-construction survey of the final site and development footprint. » Verify that the proposed project	» Prior to the commencement of construction. » Prior to construction » Once-off, prior to the commencement of construction » Once-off, prior to the commencement of construction » Once-off, prior to the commencement of construction » Once-off training and ensure that	» Project Developer, Construction Manager, ECO and Ecologist » Project Developer, Construction Manager, ECO and Ecologist » Project Developer and ECO » Project Developer and ECO » Contractor/ECO » ECO » ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		area and construction footprints. 6.13.4. Cordon off any significant features if required, or take remedial measures to avoid area if required. 6.13.5. Implementation of control measures relating to the conduct of construction staff and contractors on site and in relation to the prevailing natural environment. Construction staff should be managed and maintained within construction areas, and educated on waste management and conduct on site. 6.13.6. Control of all imported materials including concrete and hazardous materials to ensure that materials are managed on site and within the construction footprint. Control of all waste materials to ensure that all materials are removed from site, including sewage, for disposal at an	construction area is determined and outlined prior to the commencement of the construction phase by reviewing signed minutes of meetings or signed reports. » Ensure that significant lithic environments and features, in proximity to the proposed project area, are demarcated as no-go areas so that they can be avoided. » Ensure that this is taken into consideration by reviewing signed minutes of meetings or signed reports. » Carry out Environmental Awareness Training.	all new staff are inducted. » Monthly » Daily » Weekly	» ECO and Contractor » ECO and Contractor

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		appropriate point (i.e. a licenced facility). 6.13.7. Ensure a well-managed and timeous construction schedule to avoid prolonged period of construction and disturbance.	» Conduct audits of the signed attendance registers. » Conduct audits to ensure that a waste disposal system is compiled and abided by, and updated as required. » Carry out audits to verify if the construction process is being managed efficiently with the aim of avoiding unnecessary delays, which may have an impact on the surrounding environment.		
6.14. Increased ELP levels as a result of light pollution that may be associated with all built structures of the proposed project and the projects considered within the 50 km radius (cumulative impact). The	To reduce the impact of increased ELP on nocturnal species, resulting in alteration of ecological processes.	6.14.1. The direction of lighting should not be focused outside of the subject area, while the level of lumens should be such that the necessary lighting to achieve its objective is	» Ensure that these lighting requirements are taken into consideration and included in the contract specifications.	» Once-off, prior to the commencement of construction	» Contractor and ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
cumulative level of increased lighting in the area will serve to alter the behaviour of a number of nocturnal (and possibly crepuscular and diurnal) species and alter ecological processes in and around these points (i.e. localised change in species composition and ethology with concomitant change in ecosystem function).		achieved (security, operations etc.).	Verify this by undertaking site audits and recording and reporting any non-compliance.		
6.15. Increased and expanded anthropogenic influences across the region (within a 50 km radius), with the likely influence of ousting particular species of fauna. Increased noise pollution levels with concomitant impact on faunal behaviour in respect of smaller mammals and other fauna that utilise sound in their various behavioural patterns (prey	To reduce the likelihood of ousting of fauna and impact on faunal behaviour as a result of increased and expanded anthropogenic influences and noise pollution.	6.15.1. Control and management procedures relating to construction activities in and around the distribution line and associated infrastructure to be implemented (i.e. management relating to disturbance of flora and fauna).	» Carry out visual inspections to ensure strict control over the disturbance of flora and fauna.	» Weekly	» ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
detection, social interaction). These are cumulative impacts.					
6.16. Vegetation and habitat alteration, and change in ecological processes and habitat with reversion to secondary habitat structure at transformed sites. Recruitment and behavioural change in fauna (i.e. change in ecological processes and habitat). These are cumulative impacts.	To reduce the impact of vegetation and habitat alteration and the likelihood of recruitment and behavioural change in fauna.	6.16.1. Compile and implement a Vegetation Rehabilitation Plan in order to improve habitat diversity and maintenance of improved habitat within areas subject to change as a consequence of the proposed development.	» Ensure that a suitable specialist is appointed to compile a Vegetation Rehabilitation Plan. Review signed minutes of meetings or signed reports.	» Once-off prior to construction and implementation during construction.	» Project Developer, Construction Manager, ECO and Ecologist
6.17. Increased dissection of habitat on account of increasing levels of infrastructure resulting in changes in plant community structure and species composition. This is a cumulative impact.	Reduce dissection of habitat.	6.17.1. Implementation of control measures relating to conduct of staff and contractors on site and in relation to the prevailing natural environment.	» Carry out Environmental Awareness Training. » Conduct audits of the signed attendance registers.	» Once-off training and ensure that all new staff are inducted. » Monthly	» Contractor and ECO » ECO
6.18. Disturbance of terrestrial fauna and flora	To advise construction staff of the requirements	6.18.1. Conduct an Environmental Awareness Training and	» Carry out Environmental	» Prior to construction and	» ECO and Contractor

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
on site due to construction workers and activities.	in respect of management of flora and fauna on site during the construction phase.	induction for all construction staff and personnel.	Awareness Training with a discussion on the management of terrestrial fauna and flora on site. » Conduct audits of the signed attendance registers.	as required by the ECO. Ensure that all new staff are inducted. » Monthly	» ECO
C. OPERATIONAL PHASE					
6.19. Disturbance of vegetation and alteration of vegetation community structure and habitat form as a result of maintenance operations around the proposed PV facility and associated electrical infrastructure, as well as increased human and vehicle traffic levels.	The maintenance of the prevailing habitat form and type in areas subject to disturbance during the operational phase.	6.19.1. Implement vegetation management and conservation initiatives which includes exotic weed control; vegetation management along power line and service road route; and around fence lines and within the site; and monitoring and maintenance of larger plant associations in proximity to infrastructure. 6.19.2. Undertake regular review of vegetation and habitat in and around the PV facility, towers and substation. 6.19.3. Identify protocol for pruning of vegetation and clearance where required.	» Undertake monitoring via visual inspections of the site, and record and report non-compliance and recommend methods to rectify any areas of concern. » Identify means of pruning and clearance of vegetation. For example, brushcutter, grazing etc.	» Monthly » Ongoing and as required	» Project Developer » ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
6.20. Increase in terrestrial mortalities through the movement of vehicles travelling to and within the site, and along the line route.	To reduce the risk to fauna due to activities associated with the operations of the proposed infrastructure.	6.20.1. Develop protocols in respect of management of wildlife within and immediately adjacent to the operational area. 6.20.2. Undertake a regular assessment of the operational site to identify the presence of fauna within work areas. Address and relocate any fauna identified. 6.20.3. Log any identified mortalities and identify the cause of such, along with remedial actions.	» Monitor mortalities and identify the associated cause if encountered. Record the number of faunal mortalities and ensure that remedial actions are implemented.	» Ongoing	» Project Developer
6.21. Change in faunal behaviour due to increased lighting around the proposed on-site substation and O&M Building (ELP), which will be lit at night. In particular, invertebrate species may be attracted to lights which have concomitant influences on the behavioural patterns of other species in the area. Alternatively, hunting and other behaviours may alter	To manage impacts on faunal behaviour and associated ecological aspects associated with ELP and operations.	6.21.1. Develop protocols in respect of management of wildlife within and immediately adjacent to the operational area. 6.21.2. Undertake a regular assessment of the operational site to identify the presence of fauna within work areas. Address and relocate any fauna identified. 6.21.3. Ensure that nuisance factors, in particular noise	» Identify points of excessive noise or light and consider mitigation measures, if possible; and monitor and log changes and faunal mortalities that are identified from time to time.	» Daily to intermittent	» Project Developer

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
as a consequence of additional lighting within an area previously devoid of such factor. Increased ELP levels is also listed as a cumulative impact.		and light are mitigated and minimised. 6.21.4. Apply suitable lumens and ensure direction of lighting is within the boundary of the proposed on-site substation. The direction of lighting should not be focused outside of the subject area, while the level of lumens should be such that the necessary lighting to achieve its objective is achieved (security, operations etc.).			
6.22. Mortality of avifauna due to entrapment in the double perimeter fence	To reduce the impact of avifaunal mortality.	6.22.1. The two fences should be placed far apart enough for birds to able to take off if they somehow end up between the two fences. 6.22.2. Staff should be sensitised to not panic birds when they discover them trapped between the fences but to approach them with caution to give them time to escape by taking off in a lengthwise direction.	» Consideration must be taken during the design phase. » Carry out Environmental Awareness Training.	» Once-off » As required	» Project Developer and ECO » ECO and Contractor

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
6.23. Birds nesting on PV facility infrastructure and distribution line.	To reduce conflict with infrastructure management and fire risks of nests. Reduce nesting of birds on the electrical infrastructure	6.23.1. Nest management on a case by case under the supervision of an Ornithologist, and in conformance with all relevant national and provincial legislation. 6.23.2. The operational phase EMP must include provision for application to the provincial authority for permits for any necessary nest management.	» Nest relocation or removal should be done under permit from the provincial authority.	» As required	» ECO
D. DECOMMISSIONING PHASE					
6.24. Recruitment and behavioural change in fauna resulting in change in ecological processes and habitat.	To manage impacts on faunal behaviour and associated ecological aspects during decommissioning activities.	6.24.1. Develop protocols in respect of management of wildlife within and adjacent to the site designated for decommissioning. Compile and implement a Vegetation Rehabilitation Plan in order to improve habitat diversity. Improved habitat complexity will buffer transformation and reduce impacts on faunal behaviour and populations. 6.24.2. Undertake regular assessment of sites to	» Appoint a suitable specialist to undertake a final site evaluation and to complete the search and rescue. Identify the plants that may need to be relocated or rescued. » Ensure that a suitable specialist is appointed to compile a Vegetation Rehabilitation Plan. Review signed	» Prior to demolition and/or decommissioning » Prior to demolition and/or decommissioning » Daily	» Project Developer and ECO » Project Developer, Ecologist and ECO » ECO and Contractor

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		identify the presence of fauna within work areas prior to and post construction. Address and relocate any fauna identified prior to demolition. 6.24.3. Ensure that nuisance factors, in particular noise and light are mitigated and minimised during removal.	minutes of meetings or signed reports. » Undertake site audits and record and report any non-compliance.		
6.25. Impact of solid waste generation on fauna as a result of potential ingestion or ensnarement. Solid waste (e.g. small bolts, wires etc.), and solid and derelict structures left on site following the demolition and removal of structures has the potential to harm or kill animals (local fauna) through ingestion or ensnarement.	The containment and correct disposal of solid waste is required in order to avert behavioural change in local fauna as well as general pollution impacts on the terrestrial habitat.	6.25.1. Ensure that waste generated on site is contained in order to prevent access by terrestrial fauna and avifauna. 6.25.2. Remove waste from site on a regular basis, following by safe disposal at a licensed waste disposal facility. 6.25.3. Ensure that a thorough survey of the site following clearance and decommissioning is undertaken. All material is to be removed from site at the end of the decommissioning phase. 6.25.4. <u>Battery units must be removed from site by the</u>	» Conduct audits to ensure that receptacles for waste are available at all sites of operation and that these are sealed off and contained. Record and report any non-compliance. » Conduct audits and site inspections to ensure that regular cleaning operations are undertaken on site, and that this includes the clearance of waste	» Daily » Daily » At the end of the decommissioning phase	» Contractor and ECO » Contractor and ECO » Project Developer and ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		supplier or accredited service provider for recycling or appropriate disposal.	materials. Record and report any non-compliance. » Conduct a final external audit to confirm that area is left in a suitable condition.		
6.26. Vegetation and habitat alteration and reversion to secondary habitat structure at transformed sites. Removal of the proposed PV facility components (including the BESS) and related infrastructure will alter the localised topography at points, which may prevent successional processes establishing at these points on account of intrinsic changes in edaphics, lithic or other factors.	Reinstatement of vegetation and habitat following closure of site or decommissioning of operations.	6.26.1. Remove all structures and relocate material off site and dispose of waste materials correctly. 6.26.2. Rip and manage compacted surface soils at areas. Areas that have been subject to compaction should be ripped mechanically, or by hand in order to promote vegetative colonisation of the affected areas. Undertake topographic sculpting of site. If and where required, areas should be sculpted to mimic the prevailing habitat. Ensure that the site is revegetated. 6.26.3. Monitor and address any exotic plant establishment.	» Carry out site inspections and audits to review the site and ensure that all structures are removed from site and correctly disposed (as required and where applicable). » Carry out inspections and site audits to ensure that the site is ripped and sculpted to conform to the prevailing topography, and that the site is re-vegetated, if and where required. Monitor the	» Once-off operation » Throughout the decommissioning phase. » Throughout the decommissioning phase. » Once-off prior to decommissioning and implementation during decommissioning.	» Project Developer and ECO » Project Developer and ECO » Project Developer and ECO » Project Developer, Decommissioning Manager, ECO and Ecologist

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		6.26.4. Compile and implement a Vegetation Rehabilitation Plan in order to improve habitat diversity. Establish rehabilitation protocols and management interventions for site that would include post construction remediation and rehabilitation. 6.26.5. Undertake management of secondary emergent vegetation communities to ensure that emergent vegetation is aligned to prevailing habitat. 6.26.6. Damaged and used batteries should be removed from site by the supplier or accredited service provider for recycling or appropriate disposal.	management measures to verify if they are implemented successfully in order to ensure plant re-vegetation. » Carry out visual inspections to verify the removal of exotic plant species and record and report any non-compliance. » Ensure that a suitable specialist is appointed to compile a Vegetation Rehabilitation Plan. Review signed minutes of meetings or signed reports.		
6.27. Rehabilitation of flora on site	Re-vegetation of the disturbed site is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to construction.	6.27.1. All damaged areas shall be rehabilitated upon completion of the contract. 6.27.2. All natural areas must be rehabilitated with species indigenous to the area. Re-	» Conduct a final external audit to confirm that area is rehabilitated to an acceptable level.	» Once off	» Project Developer with feedback and input from an appropriate specialist.

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		seed with locally-sourced seed of indigenous grass species that were recorded on site pre-construction. 6.27.3. Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas.			

7 OPEN SPACE MANAGEMENT PLAN

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
A. DESIGN PHASE					
7.1. Loss of vegetation and habitat fragmentation.	Keeping the area cleared of vegetation to a minimum.	7.1.1. Clearing of vegetation should be kept to a minimum and take into consideration the sensitivities on site shown in Appendix B of this EMPr.	» Ensure that design and layout is uniform and well-adapted to the surrounding environment and that no unnecessary areas are cleared of vegetation.	» Once-off during design	» Project Developer
7.2. Impacts due to establishment of alien invasive plants.	Ensure the appropriate removal of alien invasive vegetation from the proposed project area and prevent the establishment and spread of alien invasive	7.2.1. Ensure compliance with relevant Environmental Specifications for the control and removal of alien invasive plant species. 7.2.2. Appoint a specialist or contact relevant authorities	» Appoint a suitable specialist/ Contractor or contact the relevant authorities to seek guidance on the removal of the	» Once-off during the design phase. » Once-off during the design phase.	» Project Developer » Project Developer » ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
	plants due to the project activities.	to seek guidance on the removal of the alien vegetation on site. 7.2.3. Compile and finalise an alien weed eradication programme.	planted alien invasive species. » Appoint a suitable specialist to compile an alien invasive vegetation eradication plan. » Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.	» Once-off during the design phase.	
7.3. Permanent barriers to animal movement and habitat fragmentation.	To reduce the impact that permanent barriers (as a result of construction activities and the proposed infrastructure) will have on animal movement within the area.	7.3.1. Fencing should allow for the passage of small and medium sized mammals and all forms of mesh fencing should be avoided. 7.3.2. All remaining areas that are not impacted upon by the proposed development footprint should remain unfenced to allow for movement corridors between the remainder of the farm.	» Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports. » Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.	» Once-off during the planning and design phase » Once-off during the planning and design phase	» Project Developer » Project Developer

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
B. CONSTRUCTION PHASE					
7.4. Permanent barriers to animal movement and habitat fragmentation.	The reduction in the impact that permanent barriers (as a result of construction activities will have on animal movement within the area.	7.4.1. Fencing should allow for the passage of small and medium sized mammals and all forms of mesh fencing should be avoided.	» Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.	» Once-off during the planning and design phase	» Project Developer
7.5. Loss of vegetation and habitat fragmentation.	Keeping the area cleared of vegetation to a minimum.	7.5.1. Clearing of vegetation should be kept to a minimum, keeping the width and length of the earthworks to a minimum.	» Monitor activities and record and report non-compliance.	» Daily	» ECO and Contractor
7.6. Increases in the occurrence of exotic and invasive plants.	Reduce area of disturbance and decrease the level of exotic plants within or around the site.	7.6.1. Regular monitoring through visual inspection and redress of exotic weeds in and around site, particularly during construction. 7.6.2. Avoidance of excessive earthworks and sculpting of land.	» Monitor the presence of alien invasive species on the development site. » Maintenance of vegetation and avoidance of unnecessary clearance of route.	» Ongoing, and as when required. » Ongoing	» ECO and Contractor » ECO and Contractor
C. OPERATIONAL PHASE					
7.7. Increased risk of alien plant invasion.	Ensure that the site is kept free from alien invasive species.	7.7.1. Monitor the site and remove alien invasive species that are found.	» Implement intermittent but regular weed control initiatives on the development site.	» Reporting frequency depends on legal compliance framework.	» Project Developer

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
7.8. Increased animal road mortality.	Minimise loss of fauna as a result of road mortalities.	7.8.1. Create awareness during staff induction programmes. Staff must be made aware of the general speed limits as well as the potential animals that may cross and how to react in these situations.	» Conduct staff awareness training programmes.	» Once-off training and ensure all new staff are inducted.	» Project Developer
D. DECOMMISSIONING PHASE					
7.9. No specific impacts are associated with the decommissioning phase other than those from the operational phase that will still be relevant for the duration of the decommissioning phase due to on-going occupation of the area.	To manage impacts on the surrounding environment during the operational phase.	7.9.1. Disturbed and transformed areas should be contoured to approximate naturally occurring slopes to avoid lines and forms that will contrast with the existing landscapes	» Final external audit of area to confirm that area is rehabilitated to an acceptable level	» Once off	» Project Developer
		7.9.2. Stockpiled topsoil should be reapplied to disturbed areas and these areas should be re-vegetated using a mix of native species in such a way that the areas will form as little contrast in form, line, colour and texture with the surrounding undisturbed landscape.	» Final external audit of area to confirm that area is rehabilitated to an acceptable level	» Once off	» Project Developer
		7.9.3. Edges of re-vegetated areas should be feathered to reduce form and line	» Final external audit of area to confirm that area is	» Once off	» Project Developer

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		contrasts with surrounding undisturbed landscape.	rehabilitated to an acceptable level		

8 TRAFFIC MANAGEMENT PLAN INCLUDING TRANSPORTATION PLAN

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	*Frequency*	*Responsibility*
A. DESIGN PHASE					
8.1. Increased traffic generation.	Manage the impact that additional traffic generation will have on road network.	8.1.1. If abnormal vehicle loads need to be transported by road to the site, a permit needs to be obtained from the relevant provincial government department. 8.1.2. Temporary construction phase road signage should be provided at the Reivilo/N14 intersection. The planning and approval of this signage must be obtained from SANRAL	» Ensure that the permits are applied for and obtained prior to commencement. » Verify that this has been undertaken by reviewing approved permits. » Ensure that approval is obtained prior to commencement.	» Once-off during the design phase » Once-off during the design phase. » Once-off during the design phase.	» Contractor » ECO » Contractor
8.2. Accelerated degradation of the road structure due to construction and operational traffic.	Limit the deterioration of the road condition due to construction and operational traffic.	8.2.1. A Road Maintenance Plan should be developed for the Access Road to be used. The plan should address grading, dust suppressant mechanisms, drainage, signage and speed limits.	» Ensure that the plan is compiled and submitted prior to commencement. » Verify that this has been undertaken by reviewing approved plans.	» Once-off during the design phase » Once-off during the design phase	» Contractor » ECO
B. CONSTRUCTION PHASE					
8.3. Increased traffic generation during the construction phase resulting in a reduction of road based level of service	Reduce the amount of road based traffic during the construction phase.	8.3.1. Well maintained vehicles should be used together with well-trained drivers during the construction phase. Vehicle maintenance and driver	» Carry out random checks of driver licenses and conduct random visual inspections of construction	» Random visual inspection of vehicles weekly. » Once-off prior to construction and as required	» Contractor » Project Developer and ECO » Contractor » Contractor

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		competency should be monitored. Proof of driver competency as well as the vehicle checks should be verified and undertaken to ensure that vehicles are roadworthy and hence, do not pose a safety risk. The Contractors must ensure that construction vehicles are roadworthy, properly serviced and maintained, and respect the vehicle safety standards implemented by the Project Developer. 8.3.2. During the construction phase, suitable parking areas should be designated for trucks and vehicles. 8.3.3. Carpooling as an alternative for workers should be encouraged. 8.3.4. The use of public transport (buses and/or minibus taxis) to convey construction personnel to the site should be encouraged. 8.3.5. It is recommended that vehicles are not overloaded during the	vehicles for roadworthiness. » Monitor the placement of the designated parking area for trucks and vehicles via visual inspections and record and report any non-compliance. » Contractor may record arrival and departure times as well as number of workers using minibuses. » Perform visual inspection of vehicles during the construction phase. » Verify that this has been undertaken. » <u>Ensure battery transport and installation is undertaken by accredited service providers as well as staff.</u>	during the construction phase. » Once a month on a randomly selected day. » Random visual inspection of vehicles weekly. » Once-off prior to construction.	» ECO » ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		construction phase in order to reduce impacts on the road structures, particularly the access roads leading to the site. Random visual inspection of vehicles should be undertaken in order to monitor for overloading. The inspections should also verify if the trucks are covered with appropriate material (such as tarpaulin) if and where possible. 8.3.6. Temporary construction phase road signage should be provided at the Reivilo/N14 intersection.			
8.4. Increased level of road accidents (involving pedestrians, animals, other motorists on the surrounding tarred/ gravel road network) due to increased traffic during construction.	Minimise the impact of the construction activities on the local traffic and avoid accidents with pedestrians, animals and other drivers on the surrounding tarred/ gravel roads. Reduce number of road accidents due to increased traffic during construction.	8.4.1. Well maintained vehicles should be used together with well-trained drivers during the construction phase. Vehicle maintenance and driver competency should be monitored. Proof of driver competency as well as the vehicle checks should be verified and undertaken to ensure that vehicles are roadworthy and hence, do	» Carry out random checks of driver licenses and conduct random visual inspections of construction vehicles for roadworthiness. » Appropriate monitoring should be undertaken.	» Random visual inspection of vehicles weekly. » Weekly » Daily » Random during the construction phase » On-going » Random during the construction phase	» Contractor » Contractor and ECO » Contractor and ECO » ECO » Contractor and ECO » ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		not pose a safety risk. The Contractors must ensure that construction vehicles are roadworthy, properly serviced and maintained, and respect the vehicle safety standards implemented by the Project Developer. 8.4.2. Road mortality monitoring programme (inclusive of wildlife collisions record keeping) should be established. 8.4.3. Adhere to all speed limits applicable to all roads used. 8.4.4. Implement clear and visible signage and signals indicating movement of vehicles within and around site, especially along access roads and intersections with public and private roads.	» Ensure that speed limits are adhered to. » Carry out random visual inspections to verify speed limits and general awareness of vehicle drivers. » Implement clear signalisation. » Carry out random inspections to verify whether proper construction signage is being implemented. » Ensure battery transport and installation is undertaken by accredited service providers as well as staff.		
C. OPERATIONAL PHASE					
8.5. Increased level of road accidents (involving pedestrians, animals, other motorists on the surrounding tarred/	Minimise the impact of the operational activities on the local traffic and avoid accidents with pedestrians, animals and other drivers on	8.5.1. Adhere to all speed limits applicable to all roads used. 8.5.2. Implement clear and visible signage and signals	» Ensure that speed limits are adhered to. » Carry out random visual inspections to	» Daily » Random during the operational phase » Ongoing	» Project Developer » Project Developer

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
gravel road network) due to traffic on the maintenance road during the operational phase.	the surrounding tarred/ gravel roads. Reduce number of road accidents due to traffic during the operational phase.	indicating movement of vehicles at the Reivilo/N14 intersection to ensure safe entry and exit.	verify speed limits and general awareness of vehicle drivers. » Implement clear signalisation. » Carry out random inspections to verify whether proper operational signage is being implemented.	» Random during the operational phase	
8.6. Accelerated degradation of road structure due to operational traffic.	Limit the deterioration of the road condition due to operational phase traffic	8.6.1. The main access roads to site should be inspected on a weekly basis for structural damage. 8.6.2. Implement management strategies for dust generation e.g. apply dust suppressant on the Access and Maintenance Roads, exposed areas and stockpiles. 8.6.3. It is recommended that vehicles are not overloaded during the operational phase (where applicable) in order to reduce impacts on the road structures, particularly the access roads leading to	» Ensure that the main access road to site maintains current condition through photographic surveys and monitoring. » Ensure dust management measures are in place to adequately decrease the generation of dust. » Perform visual inspection of vehicles during the construction phase.	» Weekly » On-going » Random visual inspection of vehicles weekly » As and when necessary » Ongoing	» Facility Manager » Facility Manager » Facility Manager » Project developer » Facility Manager

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		the site. Random visual inspection of vehicles should be undertaken in order to monitor for overloading (where applicable). 8.6.4. Make provision for the repairing of subgrade deterioration (i.e. pot holes, dust holes) that could possibly result due to overloading of vehicles (where applicable) on the Access Road.	» Make provision for repairs required to road. » Implement requirements of the Road Maintenance Plan. » Adhere to requirements of the Road Maintenance Plan.		
D. DECOMMISSIONING PHASE					
8.7. Ensure that the construction mitigation and management measures are adhered to during the decommissioning phase.					

9 STORM WATER MANAGEMENT PLAN

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
A. DESIGN PHASE					
9.1. Impact of the project if a detailed storm water management plan is not correctly prepared.	To limit the effect of uncontrolled storm water run-off from developed areas onto natural areas.	9.1.1. Prepare a detailed stormwater management plan outlining appropriate treatment measures to address runoff from disturbed portions of the site, such that they do not: » result in concentrated flows into natural watercourses i.e. provision should be made for temporary or permanent measures that allow for attenuation, control of velocities and capturing of sediment upstream of natural water courses; » result in any necessity for concrete or other lining of natural water courses to protect them from concentrated flows of the development; » divert flows out of their natural flow pathways,	» Check compliance with specified conditions. » Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.	» Once-off during design followed by regular control » During the design phase	» Contractor » ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		thus depriving downstream watercourses of water.			
B. CONSTRUCTION PHASE					
9.2. Diversion and impedance surface water flows – changes to the hydrological regime and increased potential for erosion. Diversion and increased velocity of surface water flows – reduction in permeable surfaces.	Prevent interference with natural run-off patterns, diverting flows and increasing the velocity of surface water flows.	9.2.1. The appointed Contractor should compile a Method Statement for Stormwater Management during the construction phase. 9.2.2. Erosion and sedimentation into water bodies must be minimised through the effective stabilisation (gabions and Reno mattresses or similar) and the re-vegetation of any disturbed riverbanks. 9.2.3. Place energy dissipation structures in a manner that allows the management of flows prior to being discharged into the natural environment, thus not only preventing erosion, but supporting the maintenance of natural base flows within these systems i.e. hydrological regime (water quantity and quality) is maintained.	» Compile a Method Statement for Stormwater Management during the construction phase. » Inspect and verify if a Method Statement for Stormwater Management has been compiled by the Contractor via audits prior to the commencement of the construction phase. » Check compliance with specified conditions of the Stormwater Management Plan and Method Statement. » Check compliance with specified conditions of the	» Prior to the construction phase. » Once-off prior to the commencement of the construction phase. » Weekly or Bi-weekly » Weekly or bi-weekly » As needed during the construction phase » Weekly or bi-weekly » As needed during the construction phase	» Contractor » ECO » ECO » ECO » ECO » ECO » ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		9.2.4. Reinforce soil slopes to minimise erosion during rehabilitation (as needed, and once construction in a specific area has ceased). 9.2.5. Drainage along the sides of the roads should be designed so that it does not result in concentrated flows into watercourses. 9.2.6. Perform periodic inspections and maintenance of soil erosion measures and stormwater control structures.	Stormwater Management Plan and Method Statement. » Monitor activities and record and report non-compliance. » Check compliance with specified conditions of the Stormwater Management Plan and Method Statement. » Monitor activities and record and report non-compliance.		

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
9.3. Pollution of the surrounding environment as a result of the contamination of stormwater. Contamination could result from the spillage of chemicals, oils, fuels, sewage, solid waste, litter etc.	To prevent contaminated stormwater from entering into and adversely impacting on freshwater ecosystems and reducing the water quality. To reduce sedimentation of surrounding water systems. To apply best practice principles in managing risks to storm water pollution.	9.3.1. The appointed Contractor should compile a Method Statement for Stormwater Management during the construction phase. 9.3.2. Provide secure storage for fuel, oil, chemicals and other waste materials to prevent contamination of stormwater runoff. Fuels and chemicals (i.e. any hazardous materials and dangerous goods) used during the construction phase must be stored safely on site and in bunded areas. Fuel and chemical storage containers must be inspected to ensure that any leaks are detected early. 9.3.3. All stockpiles must be protected from erosion and stored on flat areas where run-off will be minimised. Erosion and sedimentation into water bodies must be minimised through effective stabilisation. No stockpiling should take place within a watercourse.	» Compile a Method Statement for Stormwater Management during the construction phase. » Inspect and verify if a Method Statement for Stormwater Management has been compiled by the Contractor via audits prior to the commencement of the construction phase. » Monitor the storage and handling of dangerous goods and hazardous materials on site via site audits and record non-compliance and incidents. Monitor if spillages have taken place and if they are removed correctly. » Monitor the excavations and	» Prior to the construction phase. » Once-off prior to the commencement of the construction phase. » Weekly » Daily » Weekly » Weekly or Bi-weekly » Weekly or Bi-weekly » Once-off prior to construction and as required during the construction phase. » Weekly or Bi-weekly » Weekly	» Contractor » ECO » ECO » ECO » Contractor and ECO » ECO » ECO » ECO » ECO » Contractor and ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		9.3.4. Stockpiles must be located away from river channels i.e. greater than 32 m. 9.3.5. Littering and contamination of water resources during construction must be prevented by effective construction camp management. 9.3.6. Emergency plans must be in place to deal with potential spillages (especially those leading to any watercourses). 9.3.7. Erosion and sedimentation into water bodies must be minimised through the effective stabilisation (gabions and Reno mattresses or similar) and the re-vegetation of any disturbed riverbanks. 9.3.8. Ensure that the temporary site camp and ablution facilities are established at least 32 m away from watercourses. 9.3.9. Regular inspections of stormwater infrastructure should be undertaken to	stockpiling process throughout the construction phase via visual site inspections. Record non-compliance and incidents. » Monitor via site audits and record non-compliance and incidents (i.e. by implementing walk through inspections). » Check compliance with specified conditions of the Stormwater Management Plan and Method Statement. » Check compliance with specified conditions of the Stormwater Management Plan and Method Statement. » Monitor the placement of the site camp via visual		

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		ensure that it is kept clear of all debris and weeds.	inspections, and record and report any non-compliance. » Check compliance with specified conditions of the Stormwater Management Plan and Method Statement. » Monitor via site audits and record non-compliance and incidents (i.e. by implementing walk through inspections).		
C. OPERATIONAL PHASE					
9.4. Stormwater discharge into the surrounding environment during operations.	To minimise the contamination of stormwater by uncontrolled release of contaminated or grey water. To protect soil resources and prevent soil erosion.	9.4.1. An operational phase Stormwater Management Plan should be designed and implemented, with a view to prevent the passage of concentrated flows from hardened surfaces and onto natural areas. 9.4.2. All release points into the natural environment must have appropriate energy	» Compile a Stormwater Management Plan for the operational phase. » Inspect and verify if a Stormwater Management Plan has been compiled prior to the commencement of	» Continuously during operational phase. » Once-off prior to the commencement of the operational phase. » Ongoing	» Project Developer » ECO » ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		dissipaters to minimise scouring/erosion. 9.4.3. Regular inspections of stormwater infrastructure should be undertaken to ensure that it is kept clear of all debris and weeds.	the operational phase. » Monitor activities and record and report non-compliance. » Monitor the placement of energy dissipaters via visual inspections, and record and report any non-compliance. » Undertake regular inspections of the stormwater infrastructure (i.e. by implementing walk through inspections).	» Weekly/Monthly	
D. DECOMMISSIONING PHASE					
9.5. Ensure that the construction mitigation and management measures are adhered to during the decommissioning phase.					

10 EROSION MANAGEMENT PLAN

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
A. CONSTRUCTION PHASE					
10.1. Increased wind erosion and resultant deposition of dust.	Prevent wind erosion and resultant deposition of dust on surrounding indigenous vegetation.	10.1.1. Sand, stone and cement should be stored in demarcated areas, and covered or sealed to prevent wind erosion and resultant deposition of dust on the surrounding indigenous vegetation. 10.1.2. During construction, efforts should be made to retain as much natural vegetation as possible on the site, to reduce disturbed areas and maintain plant cover, thus reducing erosion risks. 10.1.3. All stockpiles must be protected from erosion and stored on flat areas where run-off will be minimised. Erosion and sedimentation into water bodies must be minimised through effective stabilisation.	» Undertake regular inspections of the via site audits to verify that sand, stone and cement are stored and handled as instructed. » Monitor activities via site inspections and record and report non-compliance. » Monitor the stockpiling process throughout the construction phase via visual site inspections. Record non-compliance and incidents.	» Daily » Daily » Daily	» ECO and Contractor » ECO and Contractor » ECO
10.2. Sedimentation of the small wetland pan as a result of stormwater runoff and stockpiling of	Reduce sedimentation as a result of erosion caused by stockpiling and stormwater runoff.	10.2.1. All material that is excavated during the construction phase must be stored appropriately on site in order	» Monitor activities via site inspections and record and	» Daily	» ECO and Contractor

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
excavated material during the construction phase. The excavated material could potentially be washed into the pan via stormwater.		to minimise impacts on the surrounding aquatic environment. 10.2.2. Exposed soil surfaces should be graded to minimise runoff and increase infiltration. 10.2.3. Where possible, sandbags (or similar) should be placed at the bases of the stockpiled material in order to prevent erosion of the material. 10.2.4. Undertake periodic inspections and maintenance of soil erosion measures and stormwater control structures. 10.2.5. Stockpiles must be located at least 32 m away from watercourses, on flat areas where run-off will be minimised. 10.2.6. During periods of strong winds and heavy rain (in line with relevant rainfall patterns), the stockpiles should be covered with appropriate material (e.g. cloth, tarpaulin etc.).	report non-compliance.		
B. OPERATIONAL PHASE					
10.3. Excessive loss of natural vegetation in the development footprint	Prevent loss of natural vegetation and minimise habitat fragmentation and	10.3.1. To prevent erosion, indigenous grasses that seed themselves should (where	» ECO to advise on seed to be used.	» Prior to re-vegetation.	» Project Developer » Project Developer » Project Developer

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
area and resulting impacts on Species of Special Concern (SSC), faunal habitat and habitat fragmentation.	the loss of connectivity as a result of erosion.	possible) be left to form a ground cover and kept short. 10.3.2. The use of silt fences, sand bags or other suitable methods must be implemented in areas that are susceptible to erosion. Other erosion control measures that can be implemented are as follows: 1) Brush packing with cleared vegetation, 2) Planting of vegetation, 3) Hydro seeding/hand sowing. All erosion control mechanisms need to be regularly maintained. 10.3.3. Conduct regular monitoring for erosion to ensure that no erosion problems are occurring at the site as a result of the roads and other infrastructure. Ensure that all erosion problems are rectified as soon as possible.	» Monitor efficiency of erosion control measures. » Undertake regular monitoring for erosion to ensure is reduced and rectified as soon as possible.	» Weekly or monthly » Monthly	
10.4. Increased wind erosion and resultant deposition of dust.	Prevent wind erosion and resultant deposition of dust on surrounding indigenous vegetation.	10.4.1. Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces	» Include periodic site inspections in environmental performance reporting that inspects the	» Quarterly	» Project Developer

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		and prevents potential down slope erosion.	effectiveness and integrity of the run-off control system and specifically records occurrence or non-occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.		
C. DECOMMISSIONING PHASE					
10.5. No specific impacts are associated with the decommissioning phase other than those from the operational phase that will still be relevant for the duration of the decommissioning phase due to on-going occupation of the area. Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas. Monitoring: Final external audit of area to confirm that area is rehabilitated to an acceptable level (once off event to be conducted by ECO).					

11 HAZARDOUS SUBSTANCES LEAKAGE OR SPILLAGE MONITORING SYSTEM

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	*Frequency*	*Responsibility*
A. CONSTRUCTION PHASE					
11.1. Contamination of soil and risk of damage to vegetation and/or fauna through spillage of concrete and cement.	To control concrete and cement batching activities in order to reduce spillages and resulting contamination of soil, groundwater and the vegetation and/or fauna.	11.1.1. If any concrete mixing takes placed on site, this must be carried out in a clearly marked, designated area at the site camp on an impermeable surface (such as on boards or plastic sheeting and/or within a bunded area with an impermeable surface). 11.1.2. Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains. 11.1.3. A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted. 11.1.4. Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licenced disposal facility. Proof of disposal (i.e. waste disposal slips or waybills) should be	» Monitor the handling and storage of sand, stone and cement as instructed. » Monitor the handling and storage of sand, stone and cement as instructed. » Monitor the handling and storage of sand, stone and cement as instructed. » Monitor the handling and storage of sand, stone and cement as instructed. » Monitor waste disposal slips and waybills via site audits and	» Daily » Daily » Daily » Daily » Monthly » Daily » Daily » Monthly	» Project Developer, Contractor and ECO » Project Developer, Contractor and ECO » Project Developer, Contractor and ECO » Project Developer, Contractor and ECO » ECO » Project Developer, Contractor and ECO » Project Developer, Contractor and ECO » ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		retained on file for auditing purposes. 11.1.5. Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site. Empty cement bags must be collected from the construction area at the end of every day. Sand and aggregates containing cement must be kept damp to prevent the generation of dust. 11.1.6. Any excess sand, stone and cement must be removed from site at the completion of the construction period and disposed at a licenced waste disposal facility. Proof of disposal (i.e. waste disposal slips or waybills) should be retained on file for auditing purposes.	record non-compliance and incidents. » Monitor the handling and storage of sand, stone and cement as instructed. » Monitor the handling and storage of sand, stone and cement as instructed. » Monitor waste disposal slips and waybills via site audits and record non-compliance and incidents.		
11.2. Contamination of soil and risk of damage to vegetation and/or fauna through spillage of fuels and oils.	To control and eliminate fuel and oil spillages which may result in soil contamination and damage to vegetation and/or fauna.	11.2.1. Ensure that adequate containment structures are provided for the temporary storage of liquid dangerous goods and hazardous materials on site (such as chemicals, oil, fuel,	» Monitor the storage and handling of dangerous goods and hazardous materials on site	» Weekly » Daily » During spill events » Once-off prior to commencement of construction.	» Contractor and ECO » Contractor and ECO » ECO » ECO » ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		hydraulic fluids, lubricating oils etc.). Appropriate bund areas must be provided for the storage of these materials at the site camp. Bund areas should contain an impervious surface in order to prevent spillages from entering the ground. Bund areas should have a capacity of 110 % of the volume of the largest tank in the bund (tanks include storage of fuel/diesel). It must be ensured that all hazardous storage containers and storage areas comply with the relevant South African Bureau of Standards (SABS) standards to prevent leakage. 11.2.2. Monitor and inspect construction equipment and vehicles to ensure that no fuel spillage takes place. Ensure that drip trays are provided for construction equipment and vehicles as required.	via site audits and record non-compliance and incidents. » Monitor the construction equipment and vehicles and monitor the occurrence of spills and the management process thereof. » Record all spills and lessons learnt. » Verify if a Method Statement is compiled by reviewing approved and signed off reports. » Monitor the refuelling/ servicing process and record the occurrence of any spillages. » Monitor the handling and	» During emergency refuelling and servicing activities. » Daily (or during spills) » Daily (or during spills) » Duration of contract	» Contractor and ECO » Contractor and ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		11.2.3. Contractor to compile a Method Statement for refuelling activities under normal and emergency situations. If on-site servicing and refuelling is required in emergency situations, a designated area must be created at the construction site camp for this purpose (i.e. refuelling must take place on a sealed surface area to prevent ingress of hydrocarbons into topsoil). Drip trays or similar impervious materials must be used during these procedures. All vehicles must be regularly inspected for leaks. 11.2.4. Spilled fuel, oil or grease must be retrieved and the contaminated soil removed, cleaned and replaced or treated accordingly. 11.2.5. Contaminated soil to be collected by the Contractor (under observation of the ECO) and disposed of at a	storage of fuels and oils via site audits and monitor if spillages have taken place and if so, are removed correctly. Monitor waste disposal slips and waybills via site audits and record non-compliance and incidents. » Monitor the correct removal of contaminated soil. Monitor waste disposal slips and waybills via site audits and record non-compliance and incidents.		

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		registered waste facility designated for this purpose. Proof of disposal (i.e. waste disposal slips or waybills) should be retained on file for auditing purposes. 11.2.6. A Spill Response Method Statement must be compiled by the Contractor for the construction phase in order to manage potential spill events. 11.2.7. The Contractor must ensure that adequate spill containment and clean-up equipment are provided on site for use during spill events. 11.2.8. Portable bioremediation kit (to remedy chemical spills) is to be held on site and used as required. 11.2.9. In case of a spillage of hazardous chemicals where contamination of soil occurs, depending on the degree and level of contamination, excavation and removal to a hazardous waste disposal	» Compile a Spill Response Method Statement. » Audit signed and approved Spill Response Method Statement. » Monitor via site audits and record incidents and non-compliance. » Ensure that a well-maintained portable bioremediation kit is available on site and that construction personnel and contractors are aware of its	» Once-off (and thereafter updated as required during the construction phase). » Once-off (and thereafter as required during the construction phase). » Daily/Weekly » Daily » During spill events » During spill events	» Contractor and Project Developer » ECO » ECO and Contractor » Contractor and ECO » Project Developer » ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		facility could be necessary. If the spillage is widespread and the soil is considered to be significantly contaminated, a specialist will need to be immediately appointed to address the spillage. This will usually entail the collection of samples of the contaminated soil followed by analysis in terms of the 2014 National Norms and Standards for the Remediation of Contaminated Land and Soil Quality (i.e. GN 331). If the soil is determined to be significantly contaminated, then compliance with Part 8 of the NEMWA should be achieved by the Applicant, including notifying the Minister of Environmental Affairs of the significant contamination. 11.2.10. The Contractor must record and document all significant spill events. 11.2.11. <u>Compile (and adhere to) a procedure for the safe</u>	location and instructions » Ensure that a suitably qualified specialist is appointed to collect and analyse the contaminated soil samples in terms of the 2014 Norms and Standards (i.e. GN 331) in order to determine if the soil is significantly contaminated or not. » If the contaminated soil is considered to be significantly contaminated, then compliance with Part 8 of the NEMWA should be achieved by the Applicant. » Monitor documentation		

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		handling of dangerous goods. Establish or utilise an appropriate Hazardous Store which is in accordance with the Hazardous Substance Amendment Act, No. 53 of 1992. This should include but not be limited to: » Designated area; » All applicable safety signage; » Firefighting equipment; » Enclosed by an impermeable bund; » Protected from the elements, » Lockable; » Ventilated; and » Have adequate capacity to contain 110% of the largest container contents.	and records of significant spill events via audits and record non-compliance and incidents.		
11.3. Fire, safety risks associated with the BESS as well as leakages and impacts on soils and water resources due to Inappropriate operation and maintenance of BESS.	Ensure appropriate operation and maintenance of the battery energy storage system	11.3.1. To avoid and or minimise the potential risk of associated with the operation and maintenance of the BESS.	» Compile (and adhere to) a procedure for the safe handling of battery cells » Ensure that battery supplier user guides,	» Operation » Weekly » The O&M contractor must monitor the following indicators listed to ensure that	» O&M Contractor

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
			safety specifications and MSDS are filed on site at all times. » Operate, maintain and monitor the BESS as per supplier specifications. » Compile method statements for approval by the Technical/SHEQ Manager for battery cell, electrolyte and battery cell/ container replacement. Maintain method statements on site. » Ensure that all maintenance contractors/ staff are familiar with the supplier's specifications. » Provide signage on site specifying	they have been met: 1. BESS operated and maintained in accordance with supplier specifications. 2. Appropriate signage on site. 3. Employees appropriately trained. 4. Required documentation available on site. 5. Firefighting equipment and training provided before the operation phase commences.	

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
			the types of batteries in use and the risk of exposure to hazardous material and electric shock. » Provide signage on site specifying how electrical and chemical fires should be dealt with by first responders, and the potential risks to first responders (e.g. toxic fumes). Provide suitable firefighting equipment on site. » Maintain strict access control to the battery storage area. » Undertake regular visual checks on BESS equipment to		

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
			identify signs of damage or leaks. » Provide environmental awareness training to all personnel on site. Training should include discussion of: o Potential impact of electrolyte spills on groundwater ; o Suitable disposal of waste and effluent; o Key measures in the EMPr relevant to worker's activities; o How incidents and suggestions for		

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
			improvement can be reported. » Ensure that all attendees remain for the duration of the training and on completion sign an attendance register that clearly indicates participants' names.		
B. DECOMMISSIONING PHASE					
11.4. No specific impacts are associated with the decommissioning phase other than those from the operational phase that will still be relevant for the duration of the decommissioning phase due to on-going occupation of the area.					

12 ENVIRONMENTAL AWARENESS AND FIRE MANAGEMENT PLAN

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	*Frequency*	*Responsibility*
A. DESIGN PHASE					
12.1. Potential impacts resulting from the lack of overall compliance with the conditions of the EA (issued by the DEFF).	Ensure compliance with all environmental conditions of approval (issued by DEFF as part of the EA).	12.1.1. Audit the implementation of the EMPr requirements. 12.1.2. Establish clear and transparent reporting of the activities undertaken with regard to all recommendations included in the EMPr.	» Audit report on compliance with actions and monitoring requirements. » Audit report on compliance with actions and monitoring requirements.	» Weekly » Based on EA conditions	» Project Developer » Project Developer and ECO
B. CONSTRUCTION PHASE					
12.2. Potential risk of fire due to construction activities or behaviour of staff on site during the construction phase.	Prevent fire on site resulting from workers smoking or starting fires (i.e. cooking, heating purposes).	12.2.1. Designate smoking areas, as well as areas for cooking, where the fire hazard could be regarded as insignificant. 12.2.2. Educate workers on the dangers of open and/or unattended fires.	» Ad-hoc checks to ensure workers are smoking or cooking in designated areas only. » Ensure fire safety requirements are well understood and respected by construction personnel. » Carry out Environmental Awareness Training.	» Daily » Ongoing. » Once-off training and ensure that all new staff are inducted. » Monthly	» ECO and Contractor » ECO and Contractor » Contractor/ ECO » ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
			» Conduct audits of the signed attendance registers.		
		12.2.3. Open fires must be prohibited. No informal fires should be permitted in or near the construction areas. Appropriate fire safety training should also be provided to staff that are to be on the site for the duration of the construction phase. 12.2.4. Ensure that cooking takes place in a designated area shown on the site map. Ensure that no firewood or kindling may be gathered from the site or surrounds. 12.2.5. Fire-fighting equipment must be made available at appropriate locations on the construction site.	» Ensure fire safety requirements are well understood and respected by construction personnel. Provide basic fire safety training. » Check compliance with specified conditions using a report card, and allocate fines when necessary. » Ensure fire safety requirements are well understood and respected by workers. » Assurance of functionality of fire extinguishers via inspections and certification by an	» On-going » On-going » On-going » Bi-annually	» ECO and Contractor » ECO and Contractors » ECO and Contractor » Contractor

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
			accredited fire service company.		
12.3. Inappropriate behaviour of civil contractors and sub-contractors during the construction phase.	Prevent unnecessary impacts on the surrounding environment by ensuring that contractors are aware of the requirements of the EMPr. Ensure that contractors and sub-contractors do not induce impacts on the surrounding environment as a result of unplanned pollution on site. Ensure that actions by on-site contractors and sub-contractors and workers are properly managed in order to minimise impacts to surrounding environment.	12.3.1. Ensure that the EMPr and the EA (should it be granted by the DEFF), are included in all tender documentation and contractors and sub-contractors contracts. 12.3.2. Contractors and sub-contractors must use the ablution facilities situated in a designated area within the site; and no bathing/washing should be permitted outside the designated area. 12.3.3. All litter will be deposited in a clearly labelled, closed, animal-proof disposal bin in the construction area; particular attention needs to be paid to food waste.	» Check compliance with specified conditions using a report card, and allocate fines when necessary. » Check compliance with specified conditions using a report card, and allocate fines when necessary. » Check compliance with specified conditions using a report card, and	» On-going » On-going » On-going » On-going » On-going » Once-off training and ensure that all new staff are inducted. » Monthly	» ECO and Contractors » ECO and Contractors » ECO and Contractors » ECO and Contractors » ECO and Contractors » Contractor/ ECO » ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		12.3.4. No person other than a qualified specialist or personnel authorised by the Project Developer, will disturb or remove plants outside the demarcated construction area. 12.3.5. No person other than a qualified specialist or personnel authorised by the Project Developer, will disturb animals on the site. 12.3.6. Educate workers on site about suitable behaviour on site and initiate environmental awareness. Staff must be informed that no trapping, snaring or feeding of any animal will be allowed.	allocate fines when necessary. » Check compliance with specified conditions using a report card, and allocate fines when necessary. » Check compliance with specified conditions using a report card, and allocate fines when necessary. » Carry out Environmental Awareness Training. » Conduct audits of the signed attendance registers.		

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
12.4. Inappropriate planning of site camp establishment.	Ensure that environmental issues are taken into consideration in the planning for site establishment.	12.4.1. All construction activities, materials, equipment and personnel must be restricted to the actual construction area specified (as required to undertake the construction work). The construction area must be demarcated by the Contractor. 12.4.2. The Contractor should install and maintain Construction Site Information Boards in the position, quantity, design and dimensions specified by the Project Developer. 12.4.3. General building materials should be stored in appropriate designated areas on site such that there will be no runoff from these areas towards sensitive systems. The site camp must be removed after construction.	» Monitor compliance and record non-compliance and incidents. » Monitor compliance and record non-compliance and incidents. » Monitor compliance and record non-compliance and incidents. » Ensure battery transport and installation is undertaken by accredited service providers as well as staff.	» Before construction » Before construction » Before construction	» ECO » ECO » ECO
12.5. Increased animal road mortality.	Reduction in animal mortality.	12.5.1. The construction staff should be made aware of the presence of fauna and within the proposed project area. The construction	» Carry out Environmental Awareness Training.	» Once-off training and ensure that all new staff are inducted. » Monthly	» Contractor/ ECO » ECO » Contractor and ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		personnel and staff must also be made aware of the general speed limits on site and must be alert at all times for potential crossings, and should be trained on how to react in these situations. 12.5.2. To ensure that animals are not attracted to the site (and potentially resulting in increased road mortality), the waste collection bins and skips should be covered with suitable material, where appropriate, and the site camp must be kept clean on a daily basis. 12.5.3. Establish a monitoring programme to record the number of faunal road mortalities and collisions. If it is established that the number of collisions and faunal fatalities increase within an area, particularly with regards to smaller species (reptiles), then measures such as exclusion	» Conduct audits of the signed attendance registers. » Monitor the activities via visual inspections, and record and report any non-compliance. » Appropriate monitoring and recording should be undertaken. » Exclusion fences should be considered, if needed to direct animals to safe road crossings.	» Daily » Weekly » As required	» ECO » ECO and Contractor

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		fences within these areas only should be considered.			
12.6. Increased energy consumption during the construction phase.	Reduce energy consumption where possible.	12.6.1. Encourage the use of energy saving equipment at the site camp site (such as low voltage lights and low pressure taps) and promote recycling. Construction personnel must be made aware of energy conservation practices as part of the Environmental Awareness Training programme.	» Contractor to monitor energy usage via audits. » Carry out Environmental Awareness Training. » Conduct audits of the signed attendance registers.	» Monthly » Once-off training and ensure that all new staff are inducted. » Monthly	» Contractor » Contractor/ ECO » ECO
12.7. Impact on the regional water balance as a result of increased water usage.	Reduce water usage during the construction phase.	12.7.1. Water conservation should be practiced as follows: » Cleaning methods utilised for cleaning vehicles, floors, etc. should aim to minimise water use (e.g. sweep before wash-down). » Ensure that regular audits of water systems are conducted to identify possible water leakages. 12.7.2. Avoid the use of potable water for dust suppression during the construction phase and consider the use	» Monitor via site audits and record non-compliance and incidents. » Carry out Environmental Awareness Training with a discussion on water usage and conservation. » Conduct audits of the signed attendance registers.	» Monthly » Once-off training and ensure that all new staff are inducted. » Monthly	» ECO » Contractor/ ECO » ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		of alternative approved sources, where possible. 12.7.3. Make construction personnel aware of the importance of limiting water wastage, as well as reducing water use.			
C. OPERATION PHASE					
12.8. Pollution of the surrounding environment as a result of the handling, temporary stockpiling and disposal of hazardous waste associated the PV Facility and associated BESS	Appropriate handling and management of hazardous substances, waste and dangerous goods associated with the PV Facility and associated BESS	12.8.1. Comply with waste management legislation. 12.8.2. Minimise production of waste. 12.8.3. Ensure appropriate waste disposal. 12.8.4. Avoid environmental harm from waste disposal. 12.8.5. Ensure appropriate storage of chemicals and hazardous substances.	» Develop and adhere to a procedure for the safe handling of battery cells during the undertaking of maintenance activities. » Ensure that service providers dispose of used batteries properly by requesting and retaining receipts for disposal/refurbishment. » Ensure signage on all hazardous storage areas indicating as a minimum:	» Operation and maintenance	» O&M Contractor

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
			» The type (and chemical name/s). » Who to contact (immediately) if a spill or leak is detected. » MSDS sheets (alternatively ensure that these are available on site). » Storage areas for hazardous substances must be appropriately sealed and bunded. » Spill kits must be made available on-site for the clean-up of spills and leaks of contaminants. » All hazardous materials must be stored in the appropriate manner (stored in sealed containers within a clearly demarcated		

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
			designated area) to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. » Immediately report significant spillages and initiate an environmental site assessment for risk assessment and remediation if necessary. » Emergency response arrangements and systems such as foam pourers, fire-fighting systems and cooperation with emergency responders must be implemented.		

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
			Preventive measures could include maintenance procedures to prevent the occurrence of a catastrophic loss of containment, as well as strict control of ignition sources and other measures which may be required according to standards such as those prescribed by the South African National Standards system.		
12.9. Veld fires can pose a personal safety risk to local farmers and communities, and their homes, crops, livestock and farm infrastructure, such as gates and fences. In addition, fire can pose a risk to the PV facility and BESS infrastructure.	» To avoid and or minimise the potential risk of veld fires on local communities and their livelihoods.	12.9.1. Provide adequate firefighting equipment on site and establish a fire-fighting management plan during operation. 12.9.2. Provide appropriate fire-fighting training to selected operation and maintenance staff. 12.9.3. Ensure that appropriate communication channels	» Ensure the implementation of an appropriate fire management plan and general management measures during the operation phase	» Throughout the operation phase	» O&M Contractor

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		are established to be implemented in the event of a fire. 12.9.4. Fire breaks should be established where and when required. Cognisance must be taken of the relevant legislation when planning and burning firebreaks (in terms of timing, etc.). 12.9.5. Upon completion of the construction phase, an emergency evacuation plan must be drawn up to ensure the safety of the staff and surrounding land users in the case of an emergency. 12.9.6. Contact details of emergency services should be prominently displayed on site. 12.9.7. Road borders must be regularly maintained to ensure that vegetation remains short and that they therefore serve as an effective firebreak.			

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		12.9.8. Should panels be required to be replaced, the following will apply: 12.9.9. Materials and panels are to be stored within the previously disturbed construction laydown area. No disturbance of areas outside of these areas should occur. 12.9.10. Full clean-up of all materials must be undertaken after the removal and replacement of the solar panel arrays and associated infrastructure is complete, and disturbed areas appropriately rehabilitated. 12.9.11. Most of the materials used for solar panel systems can be recycled. The majority of the glass and semiconductor materials can be recovered and re-used or recycled. Recyclable materials must be transported off-site by truck and managed at appropriate facilities in accordance with relevant			

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		waste management regulations. No waste materials may be left on-site. 12.9.12. Waste material which cannot be recycled shall be disposed of at an appropriately licensed waste disposal site or as required by the relevant legislation.			
D. DECOMMISSIONING PHASE					
12.10. Ensure that the construction mitigation and management measures are adhered to during the decommissioning phase.					

13 SPECIFIC PROJECT RELATED ENVIRONMENTAL IMPACTS

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
A. DESIGN PHASE					
A.1. TERRESTRIAL ECOLOGY IMPACTS					
13.1. Potential impact on terrestrial ecology as a result of the proposed infrastructure.	Change in habitat through clearance of vegetation, habitat modification and related factors.	13.1.1. Ensure that a Rehabilitation Plan is compiled that identifies tasks and procedures to be instituted at specific sites where transformation of habitat has arisen. 13.1.2. Detailed design and incorporation of habitat and features into the development layout and routing of the proposed distribution line. 13.1.3. Clearing of vegetation should be kept to a minimum and take into consideration the sensitivities on site shown in Appendix B of this EMPr.	» Ensure that this is taken into consideration during the planning and design phase, and that a suitable specialist is appointed to compile a Rehabilitation Plan. Review signed minutes of meetings or signed reports. » Ensure that this is taken into consideration during the planning and design phase. » Ensure that solar panel/array and associated infrastructure design and layout	» During design cycle and before construction commences.	» Project Developer and Appointed Specialist » Project Developer/ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
			is uniform and well-adapted to the surrounding environment and that no unnecessary areas are cleared of vegetation.		
A.2. AQUATIC ECOLOGY IMPACTS					
13.2. Potential impact on aquatic ecological features of sensitivity	To protect aquatic ecological features of sensitivity.	13.2.1. Ensure that the sensitivity maps guide the design and layout of the proposed development. In terms of the applicable legislation, a 32m zone of regulation in terms of the NEMA is stipulated around all freshwater features; and these should be respected where possible and as much as feasible. Maintenance of a high level of housekeeping on the development footprint.	» Ensure that the 32 m or 100 m zone of regulation is taken into consideration in the final layout of the proposed Solar PV facility, associated infrastructure and electrical infrastructure. Ensure that this is taken into account, where possible and as feasible (as recommended by the Ecology Specialist), and that the recommended mitigation	» Once-off prior to the commencement of construction. » Ongoing	» Project Developer and ECO » Contractors and ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
			measures are implemented as required. » Inspection of wetland features on site and undertake removal of solid waste and litter on a regular basis.		
A.3. VISUAL IMPACTS					
13.3. Potential visual intrusion of construction activities on existing views of sensitive visual receptors.	Reduce visual intrusion of construction activities project wide.	13.3.1. Ensure plans are in place to minimise fire hazards and dust generation. 13.3.2. Ensure plans are in place to rehabilitate temporary cleared areas as soon as possible. 13.3.3. Ensure plans are in place to control and minimise erosion risks. 13.3.4. A lighting plan is required to minimize light pollution, light trespass and glare during construction, operational and decommissioning phases. 13.3.5. Design of buildings and structures should include appropriate colours to blend into the background	» Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.	» During design cycle and before construction commences.	» Project Developer » ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		landscape and materials, coatings and paints should be chosen based on minimal reflectivity. Grouped structures should be painted the same colours to reduce visual complexity and contrast. These measures exclude structures and buildings for which the choice of paint and colour may have a deleterious effect on the functionality of the building or structure (in other words, those structures for which the paint and colour are pre-determined for optimal functionality are excluded).			
A.4. HERITAGE IMPACTS (PALAEONTOLOGY, ARCHAEOLOGY AND CULTURAL LANDSCAPE)					
13.4. Impacts on archaeological remains and palaeontological material.	Achieve a layout (for the PV facility and associated BESS) that minimizes the potential later impacts to archaeological resources and/or graves. Prevent the destruction of fossils.	13.4.1. Ensure that the project layout avoids significant archaeological sites that were identified in the Heritage Impact Assessment (Appendix D4 of the BA Report). These sites should be identified on project maps and regarded as no-go zones.	» Take cognizance of the archaeological resources reported in the HIA when designing facility layout and routing. » Ensure and verify that the significant archaeological	» Once-off » Once-off » Once-off training and ensure that all new staff are inducted.	» Project Developer » ECO » ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		13.4.2. The ECO should be aware of the palaeontological sensitivity of each of the sites where development is taking place and should familiarise themselves with the Chance Find Procedure which should be followed upon the discovery of a fossil site. 13.4.3. Construction within the section of the powerline corridor that runs through the Schmidtsdrift Formation must be monitored by a qualified palaeontologist. A report detailing the results of the monitoring must be submitted to SAHRA upon completion; 13.4.4. The Final BAR and EMPr must be submitted to SAHRA for record purposes; 13.4.5. If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash	sites identified in the Heritage Impact Assessment are included on project maps and regarded as no-go zones during the planning and design phase. Review the site layout plan, and signed minutes of meetings or signed reports.		

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/Phillip Hine 021 462 5402) must be alerted. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Thingahangwi Tshivhase/Mimi Seetelo 012 320 8490), must be alerted immediately. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA;			

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		13.4.6. Should the project be granted Environmental Authorisation, SAHRA must be notified and all relevant documents submitted to the case file.			
A.5. IMPACT ON AVIFAUNA					
13.5. Impacts on avifauna.	To minimise habitat loss for avifauna and reduce disturbance on avifauna and collisions with the earthwire of the proposed distribution line.	13.5.1. Areas with large trees (as shown in Appendix B) should be retained as much as possible as they serve as potential roosting and breeding habitat for a variety of birds, including raptors. In instances where the removal of trees cannot be avoided e.g, in the powerline servitude, the minimum number of trees should be removed in order to meet the legal and safety requirements. 13.5.2. Recommendations of the Avifauna and Ecology specialist studies must be strictly implemented, especially as far as limitation of the footprint, the retention of natural vegetation and rehabilitation of	» Ensure that this is taken into consideration during the planning and design phase. » Ensure that the design phase takes cognizance of the Specialists' recommendations.	» Once-off before construction commences.	» Avifaunal specialist and Project Developer

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		transformed areas is concerned 13.5.3. Ensure that the proposed power line design includes the best available anti -bird collision line marking devices in order to make the cables more visible to birds, as recommended by the Avifauna Specialist.			
B. CONSTRUCTION PHASE					
B.1. ECOLOGICAL IMPACTS (TERRESTRIAL, AQUATIC)					
13.6. Impact on vegetation and surface water resources.	To reduce the impact of the proposed development on the surrounding habitat and surface water features.	13.6.1. Fence the outer boundary of the buffer zone off with appropriate tape. 13.6.2. Limit the footprint area of the construction activities to what is only essential in order to minimise environmental damage. 13.6.3. Implement effective waste management in order to prevent construction related waste from entering the freshwater environments. 13.6.4. Rehabilitate all wetland and riparian habitat areas affected by the proposed solar facility and electrical infrastructure to ensure that	» Carry out visual inspections and site audits to verify if these management actions are undertaken, and record and report any non-compliance.	» Weekly	» ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		the ecology of these areas is re-instated during all phases. 13.6.5. As far as possible, all rehabilitation activities should occur in the low flow season, during the drier summer months. 13.6.6. All areas affected by the solar facility and electrical infrastructure construction should be rehabilitated upon completion of construction. 13.6.7. Monitor and avoid the establishment of alien invasive plant species at the site. 13.6.8. It is recommended that a detailed rehabilitation plan be developed by a suitably qualified ecologist in order to address specific rehabilitation requirements.			
B.2. VISUAL IMPACTS					

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
13.7. Potential visual intrusion of construction activities on existing views of sensitive visual receptors.	Prevent unnecessary visual clutter and focusing attention of surrounding visual receptors on the proposed development.	13.7.1. Parking areas should be demarcated and strictly controlled so that vehicles are limited to specific areas only. 13.7.2. Preparation of the solar field area (i.e. clearance of vegetation, grading, contouring and compacting) and solar field construction should be phased in a way that makes practical sense in order to minimise the area of soil exposed and the shortest duration of exposure. 13.7.3. Night time construction should be avoided where possible (however some construction work on electrical components may need to occur after dark). 13.7.4. Night lighting of the construction sites should be minimised within requirements of safety and efficiency. 13.7.5. Maintain good housekeeping on site to avoid litter and minimize waste.	» Carry out visual inspections to ensure the construction parking area is demarcated clearly, and record and report any non-compliance. » Carry out visual inspections to ensure strict control over the parking of construction vehicles and access routes in order to restrict activities to within demarcated areas. » Ensure that this is taken into consideration prior to the commencement of construction. » Conduct site inspections to monitor the	» Weekly » Weekly » Once-off during the construction phase » Weekly » Weekly » Weekly or bi-weekly » Daily » Daily » Daily » Daily » Daily » Daily and as complaints arise. » Daily » Daily » Daily	» ECO » ECO » ECO » ECO » Contractor and ECO » Construction Manager and ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		13.7.6. Monitor construction sites for strict adherence to demarcated boundaries and minimise areas of vegetation, ground and surface disturbance. Existing clearings should be used where possible and where required. 13.7.7. Monitor that existing roads will be used for access as far as possible and that construction of new access roads is minimised. 13.7.8. Monitor that topsoil from the site is stripped, stockpiled, and stabilised before excavating earth for the proposed construction. 13.7.9. Monitor that vegetation material from vegetation removal is mulched and spread over fresh soil disturbances to aid in the rehabilitation process. 13.7.10. Monitor adherence to lighting plan. 13.7.11. Monitor adherence to rehabilitation plan (i.e. where cleared areas are	phasing of construction to verify unnecessary soil disturbance and clearing and report any non-compliance. » Construction operation times to be monitored and managed (as well as included in the tender contract). » Complaints about night lights should be investigated and documented in a register. » Carry out site visits and inspections of the construction sites and ensure good housekeeping is maintained. Record and report any non-compliance. » Carry out site visits and record and		

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		rehabilitated as soon as possible). 13.7.12. Monitor adherence to erosion control plan. 13.7.13. Monitor adherence to dust and fire control plans.	report any non-compliance. » Carry out site visits and inspections of the access routes. Record and report any non-compliance. » Carry out site visits and inspections of the topsoil management process. Record and report any non-compliance. » Carry out site visits and inspections of the re-vegetation process. Record and report any non-compliance. » Complaints about night lights should be investigated and documented in a register. Investigate any complaints about night lights and document it in a register.		

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
			» Visit sites requiring rehabilitation. » Carry out site visits and record and report any non-compliance. » Carry out site visits and record and report any non-compliance.		
B.3. HERITAGE IMPACTS (PALAEONTOLOGY, ARCHAEOLOGY AND CULTURAL LANDSCAPE) (These are direct and cumulative impacts)					
13.8. Destruction of archaeological remains or graves as a result of the construction activities. Direct impacts to archaeological resources may also occur when construction vehicles move through the area and when foundation excavations are made.	Minimise the chances of significant archaeological sites being disturbed. Minimise the chances of impacts to other heritage resources located outside of the proposed route of the electrical grid infrastructure.	13.8.1. The Contractor and ECO must be informed of the possibility of any heritage material (i.e. ensure that all personnel are aware of the potential of encountering graves and what to do if this occurs (i.e. to report any suspicious stone features prior to disturbance)). 13.8.2. Avoid and protect all identified archaeological sites if possible. Ensure that all sensitive areas are cordoned off and	» Carry out Environmental Awareness Training to ensure that the Contractors are informed of the possible type of heritage features that may be encountered during the construction phase.	» Once-off training and ensure that all new staff are » Once-off, prior to start of construction. » Once-off, prior to start of construction. » Once-off, prior to start of construction and weekly during construction. » Weekly	» Contractor/ECO » Project Developer » ECO » ECO and Archaeologist » ECO » ECO » Contractor and ECO » Project Developer » ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		protected prior to the start of construction with the buffers as stated in the Heritage Impact Assessment. 13.8.3. The no-go sites should be examined periodically by the ECO during the construction phase to ensure that they are being avoided. 13.8.4. If any archaeological material is encountered during any phase of the project, work in the immediate area should be halted, and the find should be protected *in situ* and reported to an appropriate specialist and/or to the relevant heritage resources authority (i.e. the South African Heritage Resources Agency (SAHRA)) so that a decision can be made as to how to proceed (i.e. it may require inspection by an archaeologist). Such heritage is the property of the state and may require excavation and curation in	» Ensure that this is taken into consideration by reviewing signed minutes of meetings or signed reports. » Monitor and verify if any significant sites are found within the project footprint that cannot be avoided, subsequent to the pre-construction survey. Ensure that this is taken into consideration in the site plan. » Identify and cordon off sites with appropriate barriers. Carry out visual inspections and site visits to ensure strict control over the demarcation of no-go areas. Record and report	» Daily or during excavations. » As required/necessary during the construction phase. » Weekly	

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		an approved institution. Sufficient time should be allowed to remove/collect such material. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit, must be alerted immediately. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required. 13.8.5. Ensure that no activity takes place outside of the authorized construction footprint (and construction vehicles should remain within the construction corridor).	any non-compliance. » Carry out visual inspections and site visits to ensure strict control over the demarcation of no-go areas. Record and report any non-compliance. » Monitor excavations and construction activities for archaeological materials via visual inspections and report the finds accordingly. » Contact the heritage authorities and the identified archaeologist if any heritage features are uncovered. » Carry out visual inspections to ensure strict		

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
			control over the behaviour of construction staff in order to restrict activities to within demarcated areas.		
13.9. Alteration of the cultural landscape as a result of the construction of the proposed distribution line and electrical infrastructure. The cultural landscape will be impacted through the presence of incompatible structures (i.e. the proposed power line and pylons) and the construction vehicles in the rural landscape.	Minimise the chances of the cultural landscape being disturbed.	13.9.1. Ensure use of existing roads as far as possible.	» Ensure that this is taken into consideration by reviewing signed minutes of meetings or signed reports, and the approved site layout.	» Once-off, prior to start of construction.	» ECO and Project Developer
13.10. Disturbance, damage or destruction of scientifically important fossils at or beneath the ground surface as a result of surface clearance and excavations.	Reporting, conservation, recording and judicious sampling of scientifically important fossil material exposed during the construction phase of development (The paleontological sensitivity of the site is reported as Very	13.10.1. Reporting chance fossil finds to SAHRA for possible professional mitigation. 13.10.2. Recording and sampling of fossil material and associated geological data (only necessary for chance fossil finds made during the proposed development).	» Monitoring of all substantial excavations into sedimentary bedrocks for fossil material (e.g. vertebrate bones & teeth, fossilized wood, shells)	» Throughout the construction phase. » Throughout the construction phase. » Following alert of chance fossil finds on site (It is important to note that there is no need for on-site	» ECO » ECO » Qualified palaeontologist appointed and commissioned by the Project Developer

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
	Low in the Palaeontological Study).		» Safeguarding of chance fossil finds, preferably in situ.in the original assessment. » Application by a qualified palaeontologist for fossil collection permit from SAHRA. » Palaeontologist to undertake field study of fossil finds in situ on site. Photography and sampling of important finds. » Curation of fossils collected in an approved repository (museum/of significant chance fossil finds.	palaeontological monitoring unless new fossil finds are made during development).	» Qualified palaeontologist appointed and commissioned by the Project Developer » Qualified palaeontologist appointed and commissioned by the Project Developer
B.4. AVIFAUNA IMPACTS					
13.11. Disturbance of birds and displacement effects.	To reduce disturbance of birds, in particular breeding birds.	13.11.1. A site-specific avifaunal walk through should be conducted by a qualified ornithologist as part of the site specific EMP just prior to	» Powerline walk-through. If any such sites are found case specific mitigation	» Once-off prior to construction » Weekly or bi-weekly	» ECO/Ornithologist » ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		construction, so as to ensure that no sensitive bird species have started breeding on or near site. 13.11.2. No off-road driving must be allowed 13.11.3. Measures to control noise and dust should be applied according to current best practice in the industry measures to control noise. 13.11.4. Access to areas outside the construction footprint should be strictly controlled and limited as much as possible.	measures will need to be designed. » Frequent inspections to ensure compliance with the EMPr.		
B.5. WASTE MANAGEMENT					
13.12. Pollution of the surrounding environment (including drainage features) as a result of the handling, temporary stockpiling and disposal of general waste.	Reduce environmental impacts such as soil, surface water and groundwater contamination as a result of incorrect storage, handling and disposal of general waste. Minimise the production of waste. Prevent environmental problems (e.g. pollution /	13.12.1. General waste (i.e. construction waste, building rubble, discarded concrete, bricks, tiles, wood, glass, window panes, air conditioners, plastic, metal, excavated material, packaging material, paper and domestic waste etc.) generated during the construction phase should be stockpiled temporarily	» Monitor the strategic placement of the temporary, designated waste stockpiling area at the site camp via visual inspections, and record and report any non-compliance. » Monitor the temporary	» Once-off prior to the commencement of the construction phase and as required as the construction phase process evolves. » Daily	» ECO and Contractor » ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
	change in soil pH) due to solid and liquid wastes disposed of on the site. Ensure compliance with waste management legislation.	(i.e. once-off) on site in a designated area within suitable waste collection bins and skips (or similar). Waste collection bins and skips should be covered with suitable material, where appropriate.	storage and handling of general waste on site via site audits and record non-compliance and incidents (i.e. conduct visual inspections of the temporary waste storage area).		
		13.12.2. Should the on-site stockpiling of general waste exceed 100 m^3 and a period of 90 days, then the National Norms and Standards for the Storage of Waste (published on 29 November 2013 under GN 926) must be adhered to.	» Record the amount of general waste that is temporarily stockpiled at the designated area on site, as well as the duration and record non-compliance and incidents. » Monitor the duration and amounts of general waste that is temporarily stockpiled at the designated area on site via site audits and record	» Daily » Weekly » Monthly	» Contractor » ECO » Project Developer.

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
			non-compliance and incidents (i.e. conduct visual inspections of the temporary waste storage area). » Audit compliance with the Norms and Standards for the Storage of Waste (published on 29 November 2013 under GN 926) if the storage amounts are exceeded (i.e. only if required).		
		13.12.3. Ensure that the designated stockpiling area for general waste (i.e. skips and waste collection bins) is inspected on a daily basis to verify its condition and integrity, particularly after rainfall events.	» Monitor the temporary, designated waste stockpiling area at the site camp, as well as the handling of general waste on site via site audits and record non-compliance and incidents.	» Daily	» ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		13.12.4. Ensure that general waste generated during the construction phase is removed from the site on a regular basis, and safely disposed of at an appropriate, licenced waste disposal facility by an approved waste management Contractor. Waste disposal slips or waybills should be kept on file as proof of disposal. As a general principle, waste manifests must be obtained to prove legal disposal of waste.	» Ensure that a suitable Waste Management Contractor is appointed to remove and dispose the general waste at an appropriate, licenced waste disposal facility. » Monitor waste disposal slips and waybills via site audits and record non-compliance and incidents.	» Once-off prior to the construction phase. » Weekly	» Project Developer/ Contractor » ECO
		13.12.5. Ensure that the construction site is kept clean at all times and that construction personnel are made aware of correct waste disposal methods. Littering must be prevented through effective site camp management.	» Monitor the condition of the site camp throughout the construction phase via visual site inspections. Record non-compliance and incidents. » Carry out Environmental Awareness Training.	» Daily » Once-off training and ensure that all new staff are inducted. » Monthly	» ECO and Contractor » ECO and Contractor » ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
			» Conduct audits of the signed attendance registers.		
		13.12.6. Sufficient general waste disposal bins must also be provided for use by construction personnel throughout the site. These bins must be emptied on a regular basis.	» Monitor general waste generation by construction staff and collection via audits throughout the construction phase.	» Daily or Weekly	» ECO and Contractor.
		13.12.7. Ensure that all general waste emanating from the construction phase is removed from site prior to the commencement of the rehabilitation and operational phases.	» Undertake a final inspection at the end of the construction phase in order to verify and ensure that all general waste is removed from site and correctly disposed, prior to the commencement of the rehabilitation and operational phases.	» At the end of the construction phase.	» ECO and Contractor.

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		13.12.8. Promote waste reduction, re-use, and recycling opportunities on site during the construction phase.	» Monitor waste generation and collection throughout construction. » Investigate if any complaints have been expressed by the surrounding community regarding waste handling.	» Weekly or bi-weekly	» ECO and Contractor
		13.12.9. Ensure an adequate and sustainable use of resources.	» Monitor waste generation and collection throughout construction.	» Weekly or bi-weekly	» ECO and Contractor
		13.12.10. Control and implement waste management plans provided by contractors. Ensure that relevant legislative requirements are respected.	» Control of waste management practices throughout construction phase	» Weekly or bi-weekly	» ECO and Contractor
		13.12.11. Normal sewage management practices should be implemented. These include ensuring that portable sanitation facilities are regularly emptied and the resulting sewage is contained and transported	» Monitor the placement of sanitation facilities during the construction phase via visual site inspections. Record non-	» Weekly » During construction » Weekly » Once-off training and ensure that all new staff are inducted. » Monthly	» ECO and Contractor » ECO » ECO » ECO and Contractor » ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		safely (by an appointed (suitable) service provider) for correct disposal at an appropriate, licenced facility. Proof of disposal (in the form of waste disposal slips or waybills) should be retained on file for auditing purposes. No waste water must be discharged to the natural environment. 13.12.12. As part of the Environmental Awareness Training, all construction personnel should be made aware of the sewage management practices.	compliance and incidents. » Ensure that a suitable Contractor is appointed to remove and dispose the sewage at an appropriate, licenced facility. » Monitor waste disposal slips and waybills via site audits and record non-compliance and incidents. » Carry out Environmental Awareness Training. » Conduct audits of the signed attendance registers.		
13.13. Pollution of the surrounding environment as a result of the handling, temporary stockpiling and disposal of hazardous waste.	Reduce environmental impacts such as soil, surface water and groundwater contamination as a result of incorrect storage, handling	13.13.1. Hazardous waste (i.e. empty tins, oils, fuel spillages, spilled materials and chemicals etc.) generated during the construction phase should	» Monitor the strategic placement of the temporary, designated waste stockpiling area at	» Once-off prior to the commencement of the construction phase and as required as the	» ECO and Contractor » ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
	and disposal of hazardous waste.	be stockpiled temporarily (i.e. once-off) on site in a designated area in suitable waste collection bins and leak-proof storage skips (or similar). Waste collection bins and skips should be covered with suitable material, where appropriate. Hazardous waste must be stored separately from all other general waste. The designated stockpiling area must be labelled correctly.	the site camp via visual inspections, and record and report any non-compliance. » Monitor the temporary storage and handling of hazardous waste on site via site audits and record non-compliance and incidents (i.e. conduct visual inspections of the temporary waste storage area).	construction process evolves. » Daily	
		13.13.2. Should the on-site stockpiling of hazardous waste exceed 80 m^3, then the National Norms and Standards for the Storage of Waste (published on 29 November 2013 under GN 926) must be adhered to.	» Record the amount of hazardous waste that is temporarily stockpiled at the designated area on site, as well as the duration and record non-compliance and incidents. » Monitor the duration and	» Daily » Weekly » Monthly	» Contractor » ECO » Project Developer.

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
			amounts of hazardous waste that is temporarily stockpiled at the designated area on site via site audits and record non-compliance and incidents (i.e. conduct visual inspections of the temporary waste storage area). » Audit compliance with the Norms and Standards for the Storage of Waste (published on 29 November 2013 under GN 926) if the storage amounts are exceeded (i.e. only if required).		
		13.13.3. Ensure that the designated stockpiling area for hazardous waste (i.e. leak proof skips and waste collection bins) is inspected on a daily basis to verify its condition and integrity,	» Monitor the temporary, designated waste stockpiling area at the site camp, as well as the handling of	» Daily	» ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		particularly after rainfall events.	hazardous waste on site via site audits and record non-compliance and incidents.		
		13.13.4. Ensure that all hazardous waste is removed from the site on a regular basis, and safely disposed at an appropriate, licenced hazardous waste disposal facility by an approved waste management Contractor.	» Ensure that a suitable Waste Management Contractor is appointed to remove and dispose the hazardous waste at an appropriate, licenced hazardous waste disposal facility. » Monitor waste disposal slips and waybills via site audits and record non-compliance and incidents.	» Once-off prior to the construction phase. » Weekly	» Project Developer/ Contractor » ECO
		13.13.5. Refer to the management actions in Section 12.14.5 and 12.14.7 of this Section of the EMPr and implement them for hazardous waste as well.	» Refer to the monitoring methodology in Section 12.15.5 and 12.15.7 of this Section of the EMPr and implement them	» Refer to the monitoring frequency in Section 12.15.5 and 12.15.7 of this Section of the EMPr and implement	» Construction Manager/ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
			for hazardous waste as well.	them for hazardous waste as well.	
		13.13.6. All liquid waste (used oil, paints, lubricating compounds and grease) to be packaged and disposed of by appropriate means.	» Waste removal and disposal to be monitored throughout construction	» Weekly or bi-weekly	» ECO and Contractor
		13.13.7. Adequate containers for the cleaning of equipment and materials (paint, solvent) must be provided as to avoid spillages.	» Waste removal and disposal to be monitored throughout construction	» Weekly or bi-weekly	» ECO and Contractor
		13.13.8. Waste water from construction and painting activities must be collected in a designated container and disposed of at a suitable disposal point off site.	» Waste removal and disposal to be monitored throughout construction	» Weekly or bi-weekly	» ECO and Contractor
		13.13.9. Control and implement waste management plans provided by contractors. Ensure that relevant legislative requirements are respected.	» Control of waste management practices throughout construction phase	» Weekly or bi-weekly	» ECO and Contractor
C. OPERATIONAL PHASE					
C.1. HERITAGE IMPACTS (PALAEONTOLOGY, ARCHAEOLOGY AND CULTURAL LANDSCAPE)					
13.14. Maintenance vehicles and activitie could result in damage t	Minimise the chances of significant archaeological	13.14.1. Ensure that all vehicles remain on the service road at all times and ensure that	» Carry out visual inspections to ensure strict	» Monthly	» ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
or destruction o archaeological site and/or graves.	sites and/or graves being disturbed.	no activity takes place outside of the authorized operational footprint.	control over the behaviour of operational staff in order to restrict activities to within demarcated areas.		
13.15. Destruction of palaeontological material as a result of the maintenance of the proposed facility and electrical infrastructure and service road.	Minimise the chances of significant fossil material or palaeontological sites being disturbed.	13.15.1. Ensure that all vehicles remain on the service road at all times and ensure that no activity takes place outside of the authorized operational footprint.	» Carry out visual inspections to ensure strict control over the behaviour of operational staff in order to restrict activities to within demarcated areas.	» Weekly	» ECO
C.2. VISUAL IMPACTS					
13.16. Potential visual intrusion of the proposed Solar Energy Facility on the views of sensitive visual receptors.	Reduce visual intrusion of the solar energy facility on the views of sensitive visual receptors as well as its impact on the surrounding landscape	13.16.1. Monitor effectiveness of the rehabilitation plan fo temporarily cleared area and erosion scarring. 13.16.2. Monitor building and façade maintenance. Painted features should be maintained and repainted when colour fades or paint flakes. 13.16.3. Maintain re-vegetated surfaces until a self-sustaining stand of	» Carry out visual inspections during site audits to verify the effectiveness of the rehabilitation, and record and report any non-compliance. » Carry out an inspection of solar energy facility to ensure that it is	» Monthly » Annually » Weekly during the rehabilitation phase » Throughout the operational phase » During road maintenance activities. » Throughout the operational phase	» Project Developer and Facility Manager

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		vegetation is established and visually adapted to the undisturbed surrounding vegetation. No new disturbance should be created during operations without approval from the Operations Environmental Manager. 13.16.4. Restoration of disturbed land should commence as soon after disturbance as possible. 13.16.5. Road maintenance activities should avoid damaging or disturbing vegetation. 13.16.6. Dust and noxious weed control should be part of maintenance activities.	being maintained in a good condition. » Carry out visual inspections during site audits to verify the effectiveness of the rehabilitation and the progress of rehabilitation, and record and report any non-compliance. » Ensure that all vegetation removal outside of the project footprint is approved by the Environmental Manager. » Monitor the road maintenance process to ensure limited damage to vegetation. » Record and report any non-compliance.	» During complaints/ incidents	

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
			» Monitor the presence of alien vegetation on site. » Monitor dust suppression mechanisms and record non-compliances. » Maintain an incidents/ complaints register, in which any complaints from the public must be logged. The date, time, nature of complaint, name of complainant and corrective actions must be logged for all complaints. Complaints must be investigated and, if appropriate, acted upon.		
13.17. Potential impact of night lighting of the proposed Solar Energy	Reduce the impact of night lighting of the proposed PV facility on the surrounding	13.17.1. Monitor the effectiveness o the lighting plan to minimize light spill and glare.	» Visit surrounding neighbouring farmsteads and	» Once off at the end of the construction phase or the start of	» Project Developer and

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
Facility on the nightscape of the region.	nightscape and sensitive visual receptors.	13.17.2. Lights should be switched of when not in use whenever it i in line with safety and security	ensure that residents in the surrounding landscape are not affected by glaring lights from the plant. » Complaints about night lights should be investigated and documented in a register. Investigate any complaints about night lights and document it in a register. » Carry out visual inspections during site audits to monitor lighting, and record and report any non-compliance.	the operational Phase. » As complaints arise. » Weekly	Facility Manager
C.3. AVIFAUNA IMPACTS					
13.18. Displacement of avifauna due to habitat transformation caused by the construction of the solar panels and	The minimisation of habitat loss for avifauna	13.18.1. The recommendations of the ecological specialist study must be strictly implemented, especially as far as limitation of the	» Inspections to ensure compliance with the EMPr	» Weekly or bi-weekly » Twice a year	» Facility Manager » ECO » Rehabilitation specialist

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
associated infrastructure (buildings, roads and substation).		footprint, the retention of natural vegetation and rehabilitation of transformed areas is concerned. 13.18.2. Areas with large trees (as shown in Figure 6) should be retained as much as possible as they serve as potential roosting and breeding habitat for a variety of birds, including raptors. In instances where the removal of trees cannot be avoided e.g, in the powerline servitude, the minimum number of trees should be removed in order to meet the legal and safety requirements. 13.18.3. Audits must be performed by an external rehabilitation specialist to assess the success of the rehabilitation programme and recommend changes or	» Audits to review the success of the rehabilitation programme		
13.19. Mortality of avifauna due to entrapment in the double perimeter fence.	Minimisation of avifaunal mortality.	13.19.1. Staff should be sensitized to not panic birds when they discover them trapped between the fences bit to approach them with	» Staff sensitization (e.g. staff meetings).	» Weekly or bi-weekly	» Facility Manager/ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		caution to give them time to escape by taking off in a lengthwise direction.			
13.20. Mortality of priority species due to collisions with the earthwire of the 132kV powerline.	Minimisation of avifaunal mortality.	13.20.1. The 132kV powerline should be marked with Bird Flappers on the earthwire for the entire length of the line.	» Powerline inspections to assess the condition of the Bird Flappers and to note any broken or missing ones who need to be replaced.	» Once a quarter	» Facility Manager/ECO
13.21. Bird nesting on distribution line.	To reduce conflict with infrastructure management.	13.21.1. Nest management on a case by case under the supervision of an Ornithologist, and in conformance with all relevant national and provincial legislation. 13.21.2. The operational phase EMP must include provision for application to the provincial authority for permits for any necessary nest management.	» Nest relocation or removal should be done under permit from the provincial authority	» As required	» ECO
D. DECOMMISSIONING PHASE					
D.1. VISUAL IMPACTS					
13.22. Potential visual intrusion of decommissioning activities on existing	Prevent unnecessary visual clutter and focusing attention of surrounding visual	13.22.1. Disturbed and transformed areas should be contoured to approximate naturally occurring slopes to avoid	» Conduct visual inspections to ensure that landscaping is	» Weekly	» ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
views of sensitive visual receptors.	receptors on the proposed development.	lines and forms that will contrast with the existing landscapes. 13.22.2. Edges of re-vegetated areas should be feathered to reduce form and line contrasts with surrounding undisturbed landscape.	following the rehabilitation plan.		
		13.22.3. Stockpiled topsoil should be reapplied to disturbed areas and these areas should be re-vegetated using a mix of indigenous species in such a way that the areas will form as little contrast in form, line, colour and texture with the surrounding undisturbed landscape.	» Site visits to ensure that stockpiled topsoil (or appropriate soil for vegetation when stockpiled topsoil is exhausted) is used.	» Weekly	» ECO
		13.22.4. Night lighting of decommissioning sites should be minimised within requirements of safety and efficiency.	» Complaints about night lights should be investigated and documented in a register.	» Weekly or bi-weekly	» ECO
		13.22.5. Working at night should be avoided where possible.	» Operation times for decommissioning activities to be monitored and managed (as well	» Weekly	» ECO

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
			as included in the tender contract).		
	Reduce the visual impact of decommissioning activities project wide	13.22.6. Maintain good housekeeping on site to avoid litter and minimize waste. 13.22.7. Monitor sites for strict adherence to demarcated boundaries and minimise areas of vegetation, ground and surface disturbance. Existing clearings should be used where possible and where required. 13.22.8. Monitor that existing roads will be used for access as far as possible. 13.22.9. Monitor that topsoil from the site is stripped, stockpiled, and stabilised before excavating earth. 13.22.10. Monitor that vegetation material from vegetation removal is mulched and spread over fresh soil disturbances to aid in the rehabilitation process. 13.22.11. Monitor adherence to lighting plan.	» Carry out site visits and inspections of the sites and ensure good housekeeping is maintained. Record and report any non-compliance. » Carry out site visits and record and report any non-compliance. » Carry out site visits and inspections of the access routes. Record and report any non-compliance. » Carry out site visits and inspections of the topsoil management process. Record and report any non-compliance. » Carry out site visits and inspections of the re-vegetation	» Daily » Daily » Daily » Daily » Daily » Daily and as complaints arise. » Daily » Daily » Daily	» Decommissioning Manager and ECO

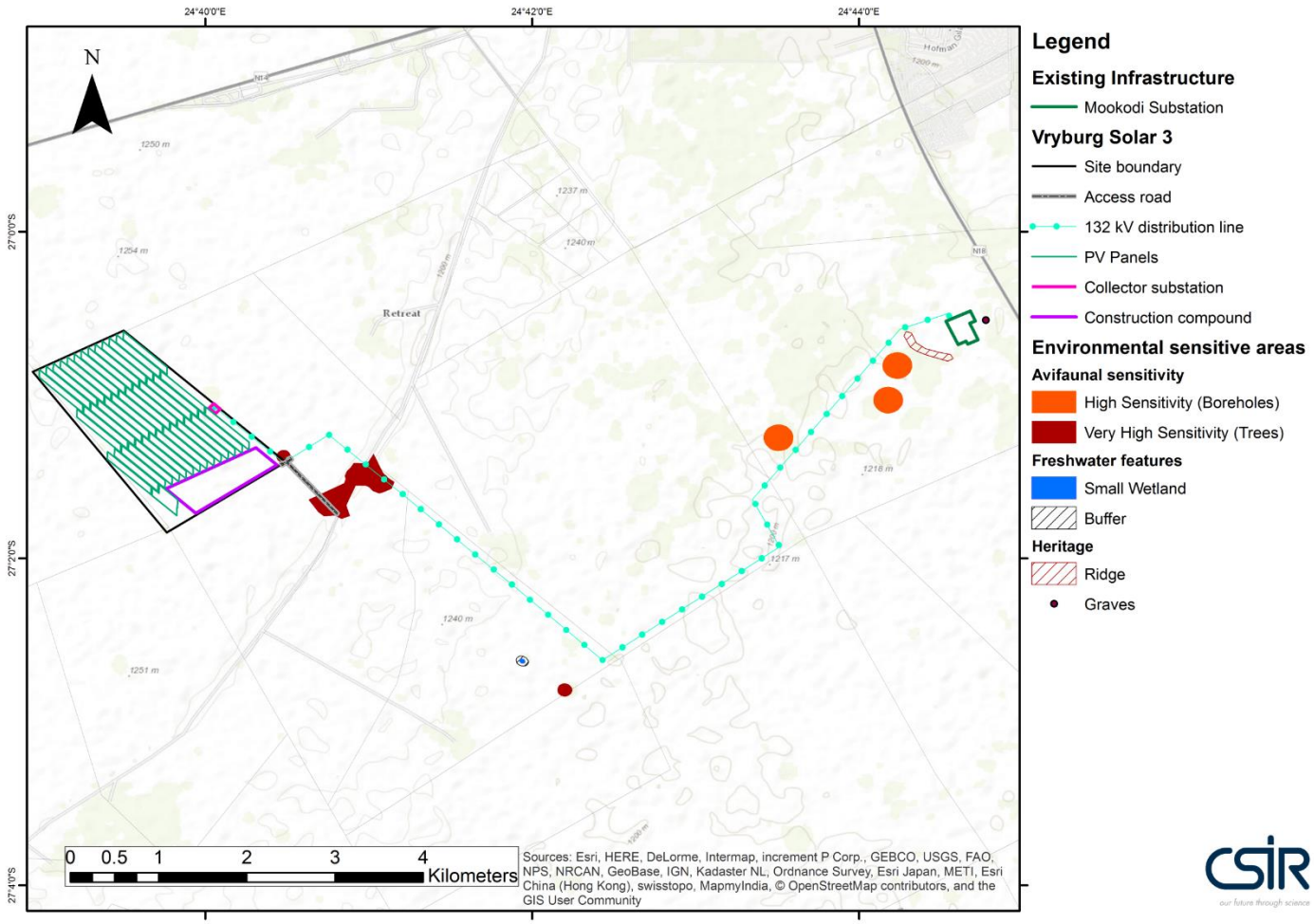
Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		13.22.12. Monitor adherence to rehabilitation plan (i.e. where cleared areas are rehabilitated as soon as possible). 13.22.13. Monitor adherence to erosion control plan. 13.22.14. Monitor adherence to dust and fire control plans.	process. Record and report any non-compliance. » Complaints about night lights should be investigated and documented in a register. Investigate any complaints about night lights and document it in a register. » Visit sites requiring rehabilitation. » Carry out site visits and record and report any non-compliance. » Carry out site visits and record and report any non-compliance.		
D.2. HERITAGE IMPACTS (PALAEONTOLOGY, ARCHAEOLOGY AND CULTURAL LANDSCAPE)					
13.23. Destruction of archaeological remains as a result of the removal of the Solar PV facility infrastructure and rehabilitation of the service road.	Minimise the chances of significant archaeological sites and/or graves being disturbed.	13.23.1. Ensure that all vehicles remain on the service road at all times and ensure that no activity takes place outside of the decommissioning footprint.	» Carry out visual inspections to ensure strict control over the behaviour of decommissioning contractors and	» Weekly	» ECO and Contractor

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
			staff in order to restrict activities to within demarcated areas.		
13.24. Alteration of the cultural landscape as a result of the removal of the proposed Solar PV facility infrastructure and rehabilitation of the service road.	Minimise the impact on the cultural landscape as a result of the presence of vehicles in the rural landscape during the decommissioning process.	13.24.1. Ensure that rehabilitation is effective and that no landscape scarring remains visible from long distances.	» Carry out visual inspections to ensure that the rehabilitation process is effective and record and report any non-compliance.	» Weekly	» ECO and Contractor
13.25. Destruction of palaeontological material as a result of the removal of the proposed Solar PV facility infrastructure and rehabilitation of the service road.	Minimise the chances of significant fossil material or palaeontological sites being disturbed.	13.25.1. Ensure that all vehicles remain on the service road at all times and ensure that no activity takes place outside of the decommissioning footprint.	» Carry out visual inspections to ensure strict control over the behaviour of decommissioning contractors and staff in order to restrict activities to within demarcated areas.	» Weekly	» ECO and Contractor
D.3. AVIFAUNA IMPACTS					
13.26. Disturbance of avifauna and displacement effects.	To reduce impact on avifauna.	13.26.1. No off-road driving must be permitted 13.26.2. Measures to control noise and dust should be applied	» Frequent inspections to ensure	» Weekly or bi-weekly » Once before the dismantling	» ECO and Ornithologist

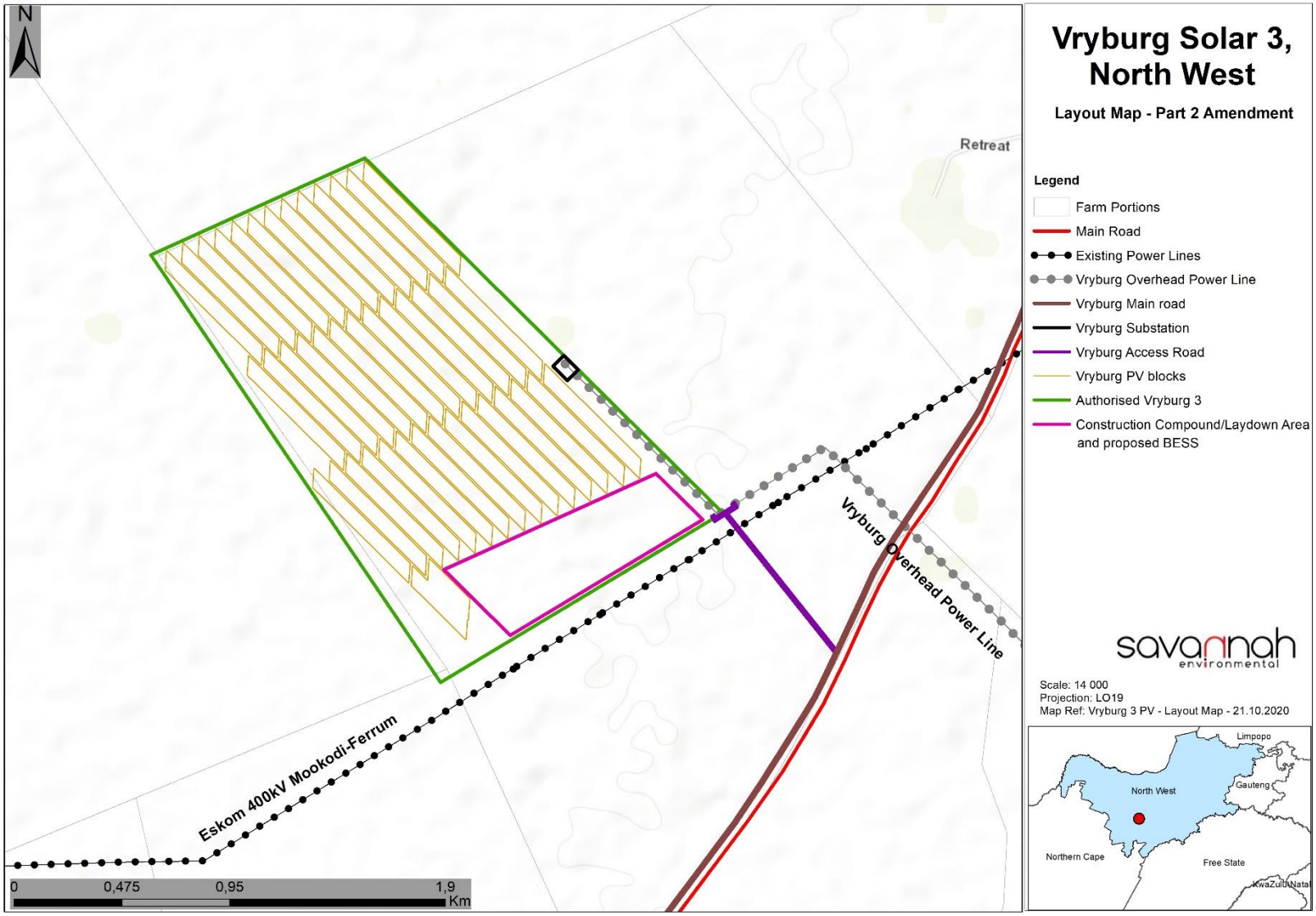
Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		according to current best practice in the industry. 13.26.3. Access to areas outside the construction footprint should be strictly controlled and limited as much as possible. 13.26.4. Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. 13.26.5. The recommendations of the ecological specialist study must be strictly implemented, especially as far as limitation of the footprint is concerned. 13.26.6. Prior to the dismantling commencing, an avifaunal specialist should conduct a site walkthrough, covering the existing power line route, to identify any nests/breeding/roosting activity of Red List species, the results of which may inform the final work schedule in close proximity to that specific area,	compliance with the EMPr » Avifaunal specialist	activities commence	

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		scheduling activities around avian breeding and/or movement schedules, and lowering levels of associated noise.			
D.4. WASTE MANAGEMENT					
13.27. Generation of waste due to disassembly of the Solar PV facility infrastructure and associated structures.	Avoid substantial negative impacts at the decommissioning phase due to insufficient planning.	13.27.1. Suitable receptacles must be provided for the temporary storage of various waste types such as scrap metal and concrete, until it is removed to the nearest licensed landfill.	» Audit the implementation of mitigation measures recommended for the decommissioning phase.	» During the decommissioning phase	» ECO
		13.27.2. Waste separation is encouraged and therefore receptacles should be labelled to reflect the different waste types.	» Audit the implementation of mitigation measures recommended for the decommissioning phase.	» During the decommissioning phase	» ECO
		13.27.3. Ensure that the construction mitigation and management measures are adhered to during the decommissioning phase.	» Audit the implementation of mitigation measures recommended for the decommissioning phase.	» During the decommissioning phase	» ECO

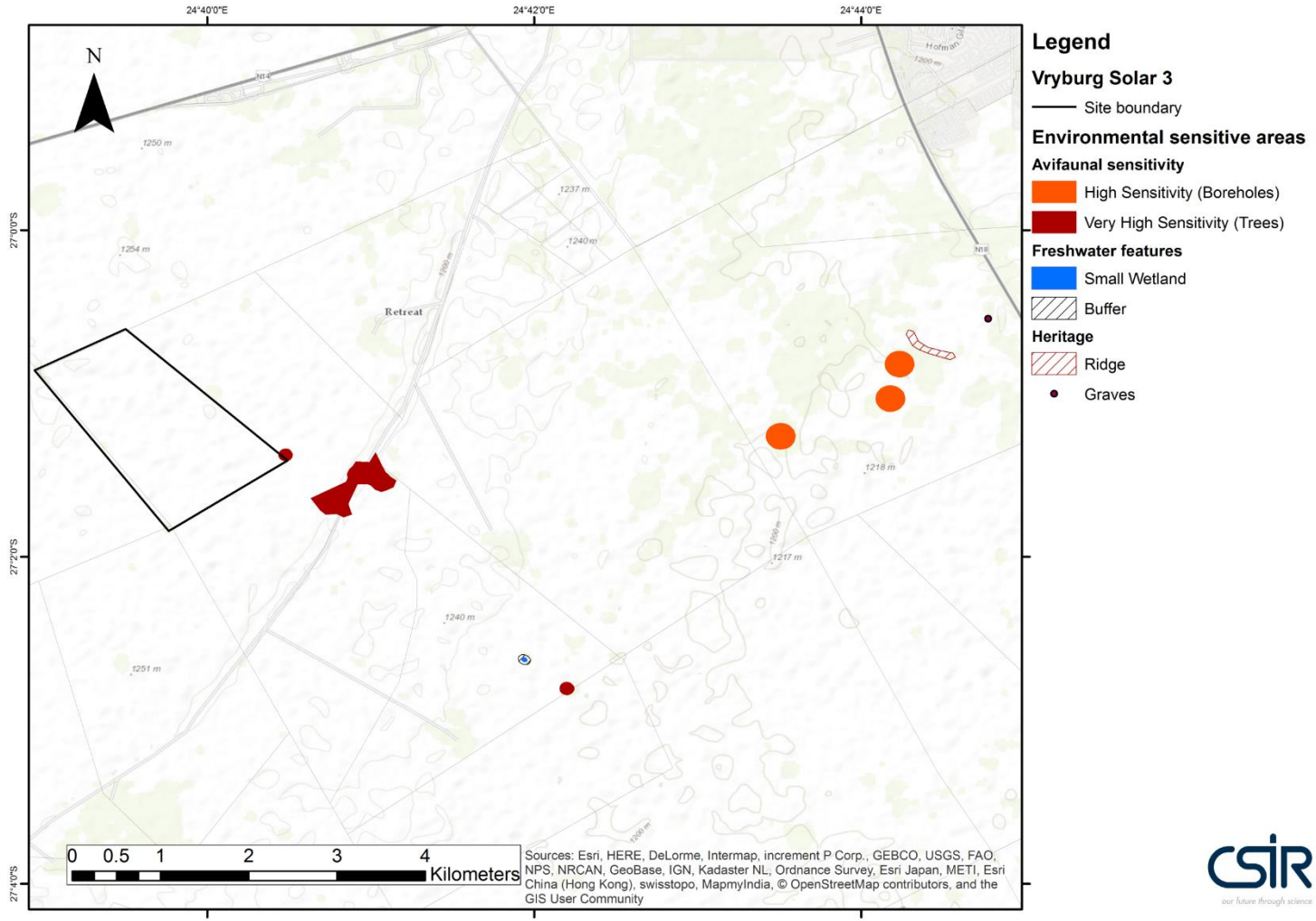
14 APPENDIX A(1) – SITE LAYOUT MAP



15 APPENDIX A(2) – SITE LAYOUT MAP (REVISION 1)



16 APPENDIX B(1) –ENVIRONMENTAL SENSITIVITY MAP



17 APPENDIX B(2) –ENVIRONMENTAL SENSITIVITY MAP (REVISION 1)