**K2022578590 (SOUTH AFRICA) PTY LTD**

# PROPOSED UP TO 130MW PHULA PV FACILITY, NEAR STEELPOORT IN THE LIMPOPO PROVINCE PROJECT ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR) CONSULTATION EMPR

**DFFE REF: 14/12/16/3/3/2/2350**

J&W Report No.: JW346/23/K135 - Rev 1

October 2023

Jones & Wagener
Engineering & Environmental Consultants

Internet presence: www.jaws.co.za

# EXECUTIVE SUMMARY

## Project Background and Motivation

K2022578590 (South Africa) Proprietary Limited (hereafter referred to as "the Applicant") is proposing to develop a Solar Photovoltaic (PV) energy facility and associated infrastructure (hereafter referred to as "Phula PV project") on the Remainder of, and Portion 2 of the farm De Grooteboom 373 KT in the Limpopo Province. The proposed project site is situated in close proximity to the local chrome and platinum mines near Steelpoort, 33 km north-west of the town of Mashishing/Lydenburg (**Figure 2-1**).

The development area of approximately 249 hectares (ha) was identified by the Applicant as a suitable area for the proposed Phula PV project. The Solar PV planned generation capacity output will be up to 130 Megawatts (MW). The proposed Phula PV project is being developed with the aim of generating renewable energy to supply to the national grid under the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or similar procurement programme.

## Legal requirements

In terms of the Environmental Impact Assessment (EIA) Regulations promulgated under the National Environmental Management Act (Act 107 of 1998) (NEMA), an Environmental Authorisation (EA) is required for the proposed Phula PV Facility.

Jones & Wagener (Pty) Ltd Engineering & Environmental Consultants (J&W) has been appointed as an independent Environmental Assessment Practitioner (EAP) to undertake the EA application process for the facility and to compile the required Environmental Management Programme (EMPr) in terms of the NEMA Regulations, as amended. The Department of Forestry, Fisheries and Environment (DFFE) reference for the Phula PV project is **14/12/16/3/3/2/2350**.

This EMPr forms part of the documentation submitted to the DFFE as the Competent Authority (CA) for the authorisation of the proposed project.

## Purpose

This EMPr has been prepared for all development phases of the proposed Phula PV Facility to ensure environmentally responsible development. It has been compiled in accordance with Appendix 4 of the EIA Regulations, as amended, and will be updated in terms of specific requirements listed in any authorisations issued for the proposed project.

The EMPr shall be binding on all the parties involved in all phases of the proposed Phula PV Facility (i.e., construction, operation and decommissioning). The EMPr shall be enforceable at all levels of contract and operational management within the project. It is the responsibility of the Applicant's Project Manager (PM) to ensure that the environmental management measures in this document as well as all relevant legislation are complied with.

## Objectives of this EMPr

The objectives of this EMPr are as follows:

- Detail compliance actions with regard to applicable legislation and guidelines (local, provincial and/or national) related to the project (**Section 3**);
- Describe actions that, when implemented, will result in the mitigation of environmental impacts or improved management of activities, thus reducing the likelihood of impacts occurring (**Section 7**);
- Define organisational and administrative arrangements for environmental management and monitoring of the proposed project, including defining the responsibilities of staff as well as co-ordination, liaison and reporting procedures (**Section 4**);

- Ensure that site personnel are made aware of pro-active environmental management and mitigation measures to be adopted during all phases of the project (**Section 9**);
- Define procedures for environmental control, in the event of pollution (spillage) or similar events requiring action (**Section 8**); and
- Define procedures for feedback to ensure continual improvement in environmental performance (**Section 12**).

### Environmental Management Actions

Throughout the undertaking of the environmental studies, individual aspects were assessed by qualified specialists and the outcome thereof has informed this EMPr. The environmentally sensitive areas or no-go areas were identified (**Figure 2-2**). Measures to avoid or minimise the identified impacts are prescribed in this EMPr (**Section 7**). The Generic EMPr for the onsite substation is also attached on **APPENDIX A**. Monitoring of the effect of the environmental management measures is required in terms of this EMPr.

### Concluding Statement

An EMPr is a working document and as such will be implemented throughout the life cycle of the project and may be amended as the responsibility for environmental management is fulfilled and adapted. It should be included as part of the contractor's contract and in the AGV's specifications for the contract. The content of this EMPr is enforceable under the general conditions of contract and the contractor should therefore ensure that the tender price submitted covers all the costs of compliance with it.

## DOCUMENT APPROVAL RECORD

Report No.: JW346/23/K135 - Rev 1

| ACTION | FUNCTION | NAME | DATE | SIGNATURE |
|---|---|---|---|---|
| Prepared | Environmental Assessment Practitioner | Luceth Khumbuzi (Reg EAP, EAPASA) | 21/09/2023 |  |
| Reviewed | Project Coordinator & Environmental Assessment Practitioner | Jana Minnaar (Reg EAP, EAPASA; PriSciNat) | 29/09/2023 |  |
| Approved | Project Director | Jacqui Hex (Reg EAP, EAPASA; PriSciNat) | 01/10/2023 |  |

**LOCATION**: Lat: -24.946272
(Decimal Degrees) Long: 30.144112

## RECORD OF REVISIONS AND ISSUES REGISTER

| DATE | REVISION | DESCRIPTION | ISSUED TO | ISSUE FORMAT | NO. COPIES |
|---|---|---|---|---|---|
| 28/09/2023 | A | Draft for internal review | J. Minnaar | Electronic | N/A |
| 29/09/2023 | A | Draft for internal review | J. Hex | Electronic | N/A |
| 2/10/2023 | 0 | Draft for Client review | K. Williams | Electronic | N/A |
| 10/10/2023 | 1 | Draft for public review | I&APs | Electronic and Hard Copy | 1 |
| 10/10/2023 | 1 | Draft for DFFE | DFFE | Electronic | N/A |

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ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)
CONSULTATION EMPR REPORT NO: JW346/23/K135 - Rev 1

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## APPENDICES

## ABBREVIATIONS/ACRONYMS USED IN THIS REPORT

| ABBREVIATION | TERM |
|---|---|
| Applicant | K2022578590 (South Africa) Proprietary Limited |
| AIP | Alien and Invasive Plants |
| BA | Basic Assessment |
| BESS | Battery Energy Storage System |
| CA | Competent Authority |
| CAA | Civil Aviation Act (Act 13 of 2009) |
| CARA | Conservation of Agricultural Resources Act |
| CM | Contractor Manager |
| CR | Critically Endangered |
| DFFE | Department of Forestry, Fisheries and the Environment (previously known as the Department of Environmental Affairs (DEA)) |
| DMRE | Department of Mineral Resources and Energy |
| DWS | Department of Water and Sanitation |
| EA | Environmental Authorisation |
| EAP | Environmental Assessment Practitioner |
| EAPASA | Environmental Assessment Practitioners Association of South Africa |
| ECO | Environmental Control Officer |
| EH&S | Supervisor: Environment, Health & Safety |
| EIA | Environmental Impact Assessment |
| EMPr | Environmental Management Program report |
| EN | Endangered |
| EPC | Engineering Procurement and Construction |
| FTLM | Fetakgomo Tubatse Local Municipality |
| GA | General Authorisation |
| GN | Government Notice |
| GNR | Government Notice Regulation |
| ha | Hectares |
| IRP | Integrated Resource Plan |
| J&W | Jones & Wagener (Pty) Ltd Engineering and Environmental Consultants |
| km | kilometres |
| kV | kilovolt |
| LEDET | Limpopo Economic Development, Environment and Tourism |
| LT | Least Threatened |
| m | metres |

| ABBREVIATION | TERM |
|---|---|
| MW | Megawatt |
| NCR | Noise Control Regulations |
| NDCR | National Dust Control regulations |
| NEM:AQA | National Environmental Management: Air Quality Act (Act 39 of 2004) |
| NEM:BA | National Environmental Management Biodiversity Act (Act 10 of 2004) |
| NEM:WA | National Environmental Management Waste Act (Act No.59 of 2008). |
| NEMA | National Environmental Management Act (Act 107 of 1998) |
| NFA | National Forests Act (Act 84 of 1998) |
| NFEPA | National Freshwater Ecosystem Priority Areas |
| NHRA | National Heritage Resources Act (Act 25 of 1999) |
| NRTA | National Road Traffic Act (Act 93 of 1996) |
| NWA | National Water Act (Act 36 of 1998) |
| O&M | Operations and Maintenance |
| OHSA | Occupational Health and Safety Act (Act 85 of 1993) |
| PCS | Power Conversion Stations |
| PM | Project Manager |
| PPE | Personal Protective Equipment |
| PrSciNat | Professional Natural Scientist |
| PV | Photovoltaic |
| RAL | Road Agency Limpopo |
| REIPPPPP | Renewable Energy Independent Power Producer Procurement Programme |
| S&EIR | Scoping and Environmental Impact Reporting |
| SACAA | South African Civil Aviation Authority |
| SACNASP | South African Council for Natural Scientific Professions |
| SAHRA | South African Heritage Resources Agency |
| SANRAL | South African National Roads Agency SOC Ltd |
| SCC | Species Conservation Concern |
| SDM | Sekhukhune District Municipality |
| SEF | Solar Energy Facilities |
| SM | Site Manager |
| SS | Switching Substation |
| TCLP | Toxic Characteristic Leaching Procedure |
| VN | Vulnerable |
| WML | Waste Management Licence |
| WUL | Water Use Licence |

Jones & Wagener
Engineering & Environmental Consultants
59 Bevan Road PO Box 1434 Rivonia 2128 South Africa
tel: 00 27 11 519 0200 www.jaws.co.za email: post@jaws.co.za

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# 1. INTRODUCTION

K2022578590 (South Africa) Proprietary Limited (hereafter referred to as "the Applicant") is proposing to develop a solar Photovoltaic (PV) energy facility and associated infrastructure (hereafter referred to as "Phula PV project") on the Remainder of, and Portion 2 of the farm De Grooteboom 373 KT in the Limpopo Province. The proposed project site is situated in close proximity to the local chrome and platinum mines near Steelpoort, 33 km north-west of the town of Mashishing/Lydenburg (**Figure 2-1**).

The development area of approximately 249 hectares (ha) was identified by the the Applicant as a suitable area for the proposed Phula PV project. The solar PV planned generation capacity output will be up to 130 Megawatts (MW). The Phula PV project is being developed with the aim of generating renewable energy to supply to the national grid under the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or similar procurement programme.

In terms of the Environmental Impact Assessment (EIA) Regulations promulgated under National Environmental Management Act (Act 107 of 1998) (NEMA), an Environmental Authorisation (EA) is required for the proposed Phula PV project. The Applicant has also identified two (2) alternatives for the grid connection infrastructure for the proposed solar facility, however, the EA application for the grid infrastructure will be subject to separate Basic Assessment (BA) process.

Jones & Wagener (Pty) Ltd Engineering & Environmental Consultants (J&W) has been appointed as an independent Environmental Assessment Practitioner (EAP) to undertake the Scoping and Environmental Impact Assessment (S&EIA) process for the Solar PV facility required EA and compiled the Environmental Management Programme (EMPr) in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA). The Department of Forestry, Fisheries and Environment (DFFE) reference for the Phula PV project is **14/12/16/3/3/2/2350**.

This EMPr forms part of the documentation submitted to the DFFE as the Competent Authority (CA) for the authorisation of the proposed project. The EMPr is a working document and as such will be implemented throughout the life cycle of the project and may be amended as the responsibility for environmental management is fulfilled and adapted. It should be included as part of the contractor's contract and the specifications for the contract. The contents of this EMPr is enforceable under the general conditions of contract and the contractor should therefore ensure that the tender price submitted covers all the costs of compliance with it.

## 1.1 Background

The proposed Phula PV project is proposed in response to the identified objectives of the national and provincial government, and local and district municipalities to develop renewable energy facilities for power generation purposes. The developer will explore opportunities to submit a bid in terms of a regulated power purchase procurement process (e.g., REIPPPP or similar procurement programme) to evacuate the generated power into the national grid. This will aid in the diversification and stabilisation of the country's electricity supply, which in line with the objectives of the Integrated Resource Plan (IRP).

From a regional perspective, the area within the Limpopo Province was identified for the development of a commercial PV facility due to the excellent solar resources, topography that is suitable for a solar PV facility, and availability of land on which the development can occur.

## 1.2 Purpose of this EMPr

The EMPr provides management actions required to reduce negative environmental impacts and enhance positive ones. This is achieved by introducing requirements and mitigatory measures that must be implemented by personnel to protect, conserve and sustain the environment throughout the life cycle of the project.

This EMPr has been prepared for all phases of the proposed project to provide recommendations and guidelines for environmental compliance monitoring throughout the duration of the proposed project as well as to ensure that all relevant impacts are considered, to ensure environmentally responsible development. The main purpose of this EMPr is to ensure that all relevant factors are considered for "good environmental practice" during all phases of the development.

This EMPr serves as a guideline document aimed at addressing environmental issues identified and guide the sustainable management (to avoid and / or minimise environmental damage) of the environment for the duration of all the project phases. It also informs all relevant parties, including the contractor, Environmental Manager (EM) and Environmental Control Officer (ECO), of their duties in the fulfilment of the legal requirements for the implementation phases of the project, with particular reference to the prevention and mitigation of anticipated potential environmental impacts.

This EMPr has been compiled in accordance with Appendix 4 of the EIA Regulations, as amended, and will be further updated in terms of specific requirements listed in any authorisations issued for the proposed project. This EMPr shall be binding on all the parties involved in all phases of the Phula PV project (i.e., construction, operation and decommissioning**)** and shall be enforceable at all levels of contract and operational management within the project. It is the responsibility of the Applicant Project Manager (PM) to ensure that the environmental management measures in this document as well as all relevant legislation are complied with.

## 1.3 Objectives of this EMPr

The objectives of this EMPr are as follows:

- Detail compliance actions with regard to applicable legislation and guidelines (local, provincial and/or national) related to the project;
- Describe actions that, when implemented, will result in the mitigation of environmental impacts or improved management of activities, thus reducing the likelihood of impacts occurring;
- Define organisational and administrative arrangements for environmental management and monitoring of the proposed project, including defining the responsibilities of staff as well as co-ordination, liaison and reporting procedures;
- Ensure that site personnel are made aware of pro-active environmental management and mitigation measures to be adopted during all phases of the project;
- Define procedures for environmental control, in the event of pollution (spillage) or similar events requiring action; and
- Define procedures for feedback to ensure continual improvement in environmental performance.

## 1.4 Authorisation Holder and Contractor Commitment

is the Authorisation Holder to be held liable for any environmental issues that may arise on the project site during the various project phases. The project requires a commitment on the following:

- Ensure compliance with the environmental, health and safety requirements;
- Ensure that environmental conditions / requirements that are stipulated in the EA, EMPr, Water Use Licence (WUL) and other approved permits/licences are complied with;
- Resolve any problems and claims resulting from damage immediately to ensure the smooth running of operations;
- Implement this EMPr for the benefit of all parties involved; and
- Preserve the natural environment by limiting destructive activities on the project site.

## 1.5 Details of the EAP

The details of the EAP responsible for the EA application process in respect of this project are provided in **Table 1-1** below.

**Table 1-1: Project EAP details**

| | | | | | |
|---|---|---|---|---|---|
| COMPANY | Jones & Wagener (Pty) Ltd Engineering and Environmental Consultants | | | | |
| PROJECT EAP | Ms. Jana Minnaar (de Jager) | | | | |
| POSTAL ADDRESS: | PO BOX 1434, Rivonia, 2128 | | | | |
| EMAIL: | jana@jaws.co.za | TEL: | +27 11 519 0200 | FAX: | +27 11 519 0201 |
| PROFESSIONAL REGISTRATION (S): | Registered EAP (EAPASA) | DATE: | 01/03/2022 – 29/02/2024 | REG NO: | 2019/665 |

A brief summary of the expertise of the environmental team associated with this project is provided in **Table 1-2**.

**Table 1-2: Expertise of the EAPs**

| NAME | ORGANISATION | HIGHEST QUALIFICATIONS | EXPERIENCE | PROFESSIONAL REGISTRATIONS |
|---|---|---|---|---|
| Ms. Jacqui Hex (Project Director) | J&W | MSc Environmental Management | 15 years | EAPASA Registered EAP SACNASP PrSciNat |
| Ms. Jana de Jager (Project Coordinator -EAP) | | MSc Environmental Management | 6 years | EAPASA Registered EAP SACNASP PrSciNat |
| Ms. Luceth Khumbuzi (Environmental Scientist) | | BSc Environmental Science | 5 years | EAPASA Registered EAP |
| Ms Anelle Lötter (Public Participation Practitioner) | | National Diploma in Journalism | 20+ years | Member of the International Association of Public Participation (IAP2) |

# 2. DESCRIPTION OF THE PROJECT

## 2.1 Project location

The proposed development site is situated in close proximity to the local chrome and platinum mines near Steelpoort, 33 km south-east of the town of Lydenburg. It is located on the Remainder of, and Portion 2 of the farm De Grooteboom 373 KT within Fetakgomo Tubatse Local Municipality (FTLM) in the Limpopo Province. The locality of the proposed site is presented in **Figure 2-1** and details of project site are provided in **Table 2-1**.

**Table 2-1: Site details for the Phula PV project**

| | |
|---|---|
| PROVINCE | Limpopo |
| LOCAL MUNICIPALITY | Fetakgomo Tubatse (Greater Tubatse) |
| DISTRICT MUNICIPALITY | Sekhukhune |
| NEAREST TOWN | 33km south-east of the town of Lydenburg |
| PHYSICAL ADDRESS | Farm De Grooteboom 373 KT, Greater Tubatse, Steelpoort, 1133 |
| SITE CENTRAL COORDINATES | 24°56'46.58"S; 30° 8'38.80"E |
| SITE AREA | approximately 249 ha |
| FARM NAME | De Grooteboom 373 KT |
| PORTION NO. | Remainder of portion 0, and Portion 2 |

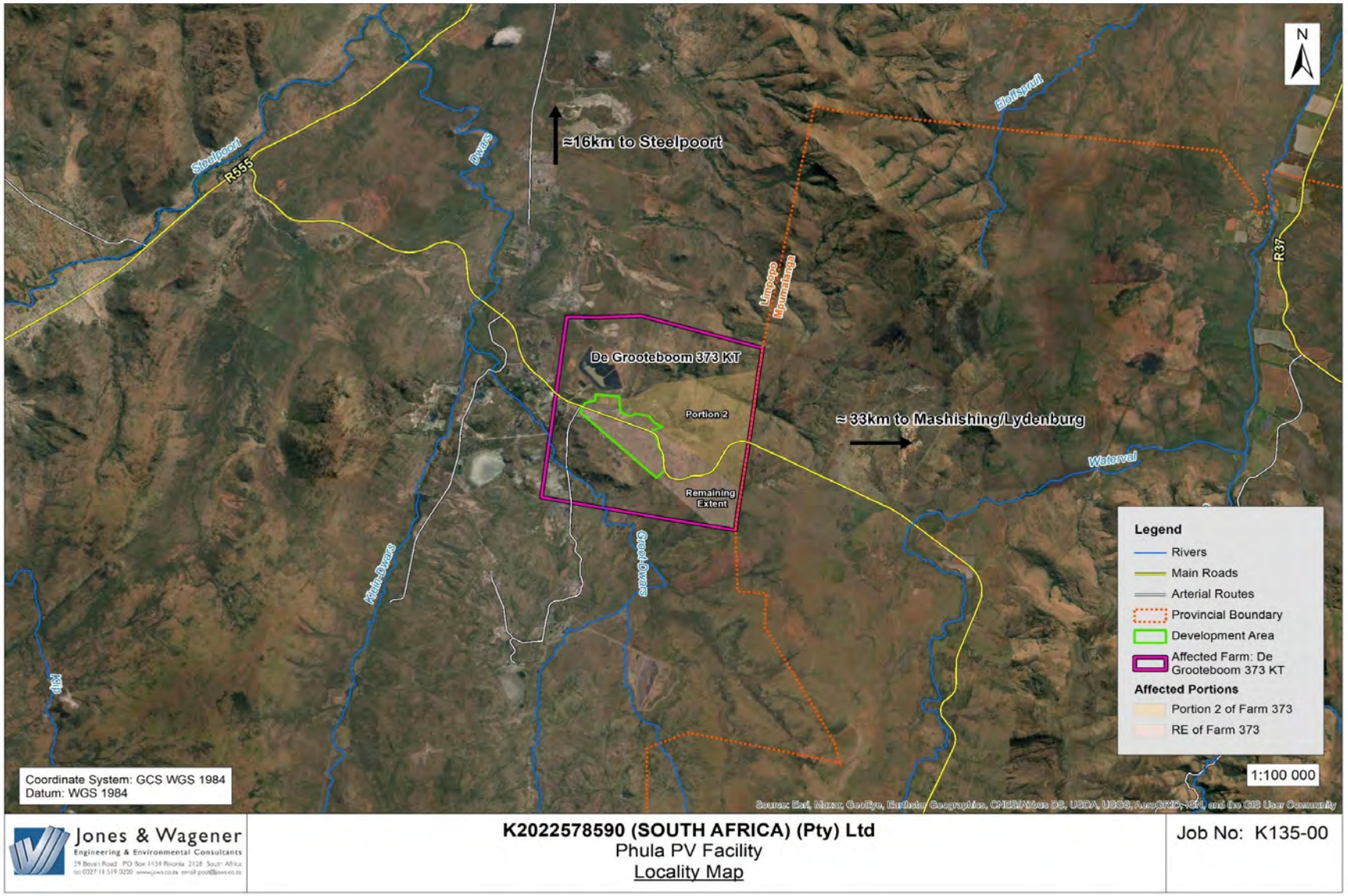



**Figure 2-1: Locality map of Phula PV facility**

## 2.2 Description of proposed activities

The Phula PV project will make use of solar PV technology to generate electricity (a maximum capacity of up to 130MW) from solar energy. The proposed Phula PV project development footprint will cover an area of 184.36 ha of the overall proposed development area of approximately 249 ha layout as presented in **Figure 2-2**. The developer has identified two (2) alternatives for the grid connection infrastructure for the proposed solar facility. However, the EMPr will be compiled during the EA application process for the grid infrastructure.

### 2.2.1 Components of the Phula PV facility

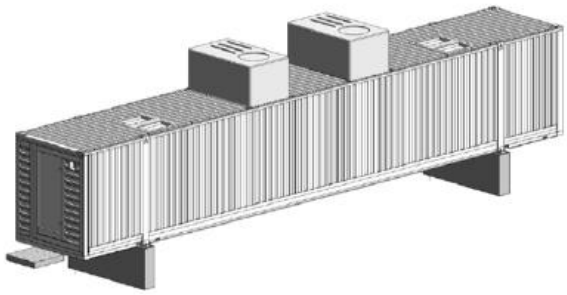
The main technology will be inverter and solar PV generation based. Inverter technology will either be string-type and mounted on or next to the PV structures, or central-type and mounted in containers on concrete foundations.

The Phula PV project site is proposed to accommodate the following infrastructure:

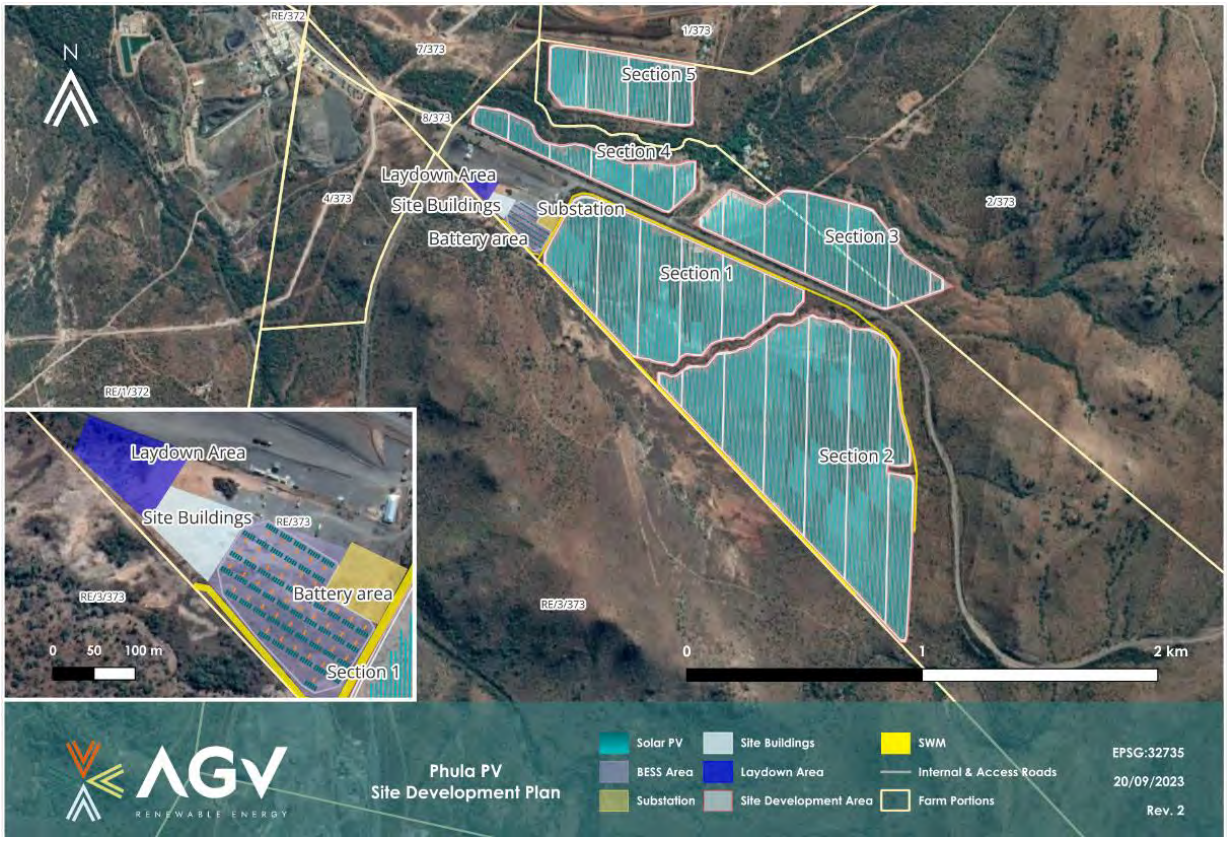
- PV panels mounted on either a single axis tracking or fixed structure;
- Inverters and transformers;
- Low voltage cabling between the PV panels to the inverters;
- Fence around the project development area with security and access control;
- Camera surveillance;
- 33kV cabling between the project components and the facility substation;
- 33/132kV onsite facility substation;
- Battery Energy Storage System (BESS) with a footprint of 2.5ha;
- Site offices and maintenance buildings, including workshop areas for maintenance and storage as well as parking for staff and visitors;
- Laydown/staging area on-site in front of mounting structures during installation;
- Temporary store area close to site entrance (less than 2ha);
- Access roads (up to 6m wide) and internal distribution roads (up to 5m wide);
- Temporary concrete batching facility; and
- Stormwater management infrastructure.

**Table 2-2** below provides a summary of the infrastructure required for the establishment of the proposed Phula PV solar energy facility. The layout plan is provided in **Figure 2-2** .

**Table 2-2: Details of infrastructure as part of the Phula PV project**

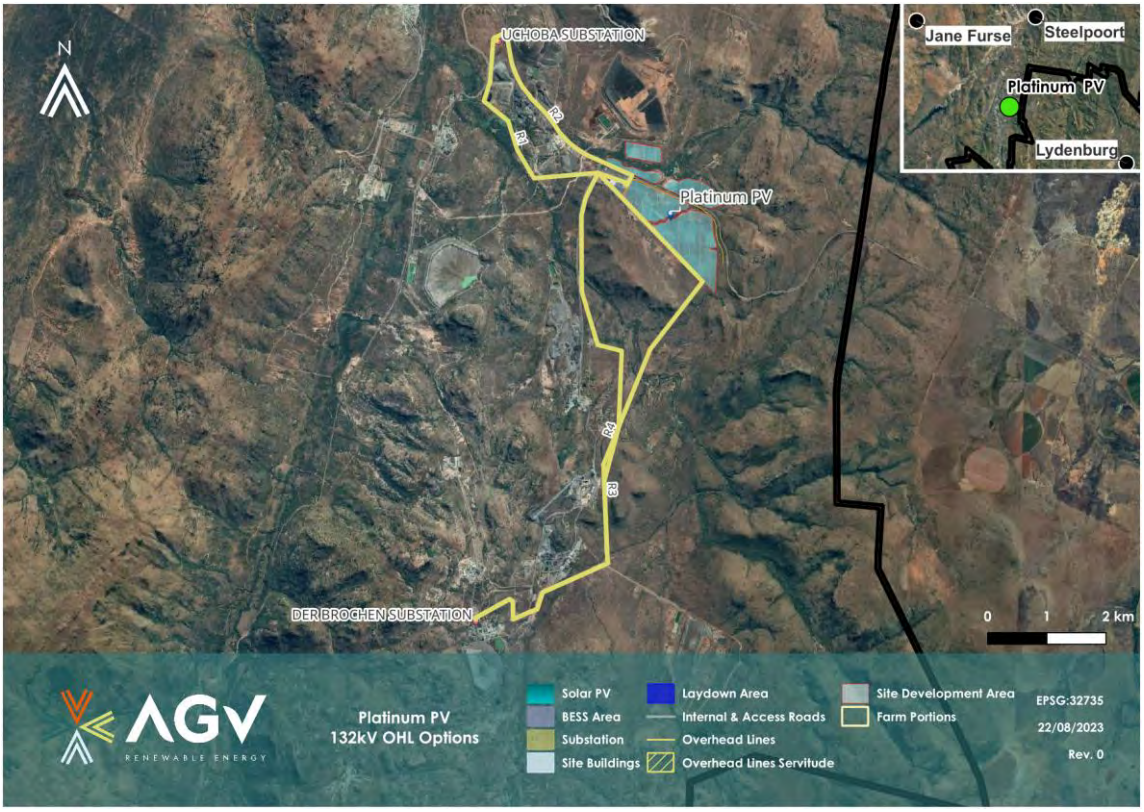
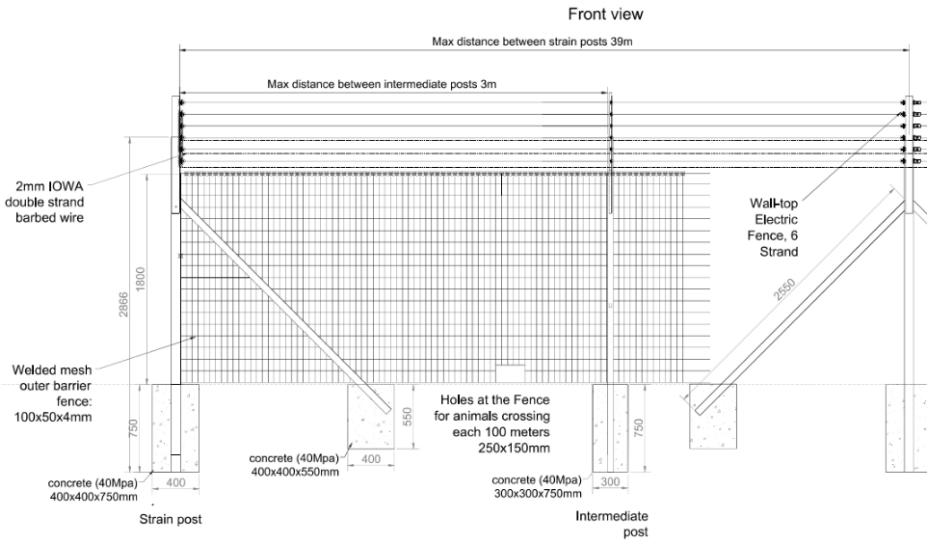
| INFRASTRUCTURE | DESCRIPTION / DIMENSIONS |
|---|---|
| Contracted capacity of PV facility | Up to 130 MW |
| Technologies | • Solar Photovoltaic (PV) system<br>• PV modules mounted on either a single axis tracking or fixed structure.<br>• Monofacial or Bifacial Panels<br>• Lithium-Ion, Vanadium Redox Flow or similar Batteries |
| BESS capacity | 100MW / 500MWh |
| Onsite substation | 33kV cabling between the project components and the facility substation. 33kV/132kV onsite facility substation. |
| Height of PV modules | 3m at highest point above ground level when PV modules are pointing due east or west. |
| Battery array height | Up to 3.5 metres<br>  |
| On-site substation and BESS complex area | The proposed facility layout has been revised:<br>A 50m avifauna buffer around the Springkaanspruit, a 38m biodiversity buffer dividing the main development area into two portions and the conceptual stormwater management infrastructure have informed the layout of the proposed Phula PV facility.<br>Therefore, the revised facility layout makes provision for one on-site substation at the Section 1 (southwestern portion) of the proposed development – gold polygon in Figure 2. The footprint area is approximately 0.6 ha.<br>A BESS area is proposed west of the on-site substation with a proposed footprint area of approximately 2.5 ha – purple polygon in Figure 2. The combined footprint is therefore (approximately) 3.1 ha.<br>A construction laydown / storage area is proposed west of the BESS with a proposed footprint of 0.93 ha. |

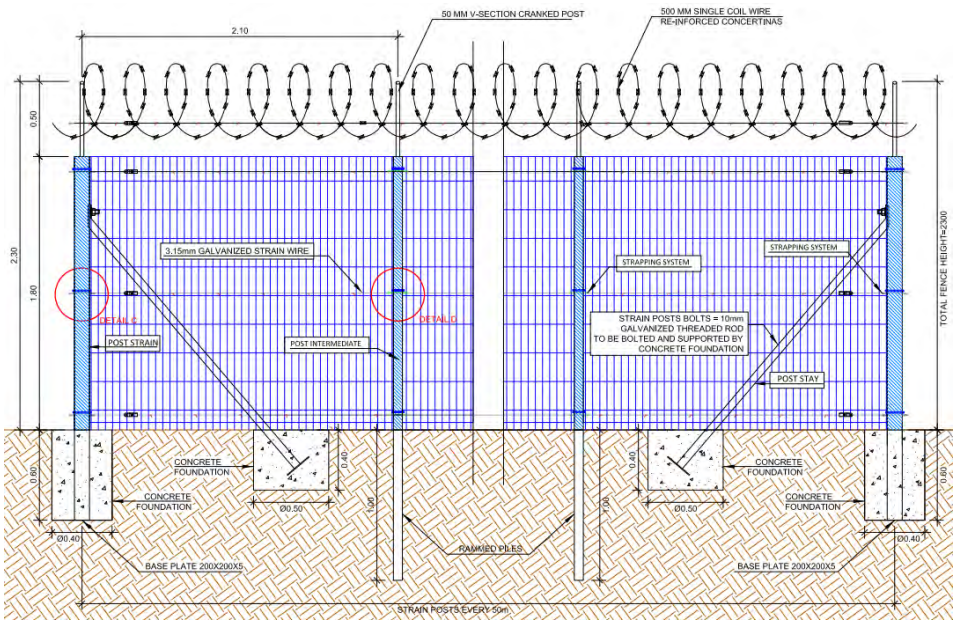
| INFRASTRUCTURE | DESCRIPTION / DIMENSIONS |
|---|---|




| | | | |
|---|---|---|---|
| Development footprints | FOOTPRINT | AREA | CENTRAL CO-ORDINATES (DMS) |
| | Section 1 | 44.37 ha | 24°56'38.54"S; 30° 8'22.30"E |
| | Section 2 | 79.45 ha | 24°56'59.56"S; 30° 8'46.97"E |
| | Section 3 | 28.53 ha | 24°56'31.77"S; 30° 8'48.73"E |
| | Section 4 | 12.76 ha | 24°56'21.89"S; 30° 8'13.81"E |
| | Section 5 | 16.32 ha | 24°56'10.79"S; 30° 8'17.82"E |
| | Laydown area | 0.931 ha | 24°56'25.39"S; 30° 7'57.36"E |
| | Site buildings | 0.75 ha | 24°56'27.65"S; 30° 8'0.00"E |
| | Substation | 0.56 ha | 24°56'29.68"S; 30° 8'7.25"E |
| | Battery Area | 2.5 ha | 24°56'30.43"S; 30° 8'3.97"E |
| | Total area | 184.36 ha | |
| Laydown and temporary storage area | Laydown/staging area on-site in front of mounting structures during installation. The proposed temporary store area is located west of the proposed BESS area with a footprint of approximately 0.93 ha | | |
| Operations and Maintenance (O&M) building area | O&M building will be located at the area named 'Site Buildings' near the substation and battery areas or at the western-most side of Section 1. The estimated size of the building is 600m², excluding parking. | | |

| INFRASTRUCTURE | DESCRIPTION / DIMENSIONS |
|---|---|
| Width of internal access roads | Access roads (up to 6m wide) and internal distribution roads (up to 5m wide). |
| Length of internal access roads | Estimated at approx. 27 km. |
| Site access | Proposed access roads have been recommended by a transport engineer. These access points consider the various guidelines and policies in terms of the sites location and the provincial roads.<br>Five access points are proposed (depicted on the layout plan):<br>• Access 1 and 2 – access to the main (southern) facility area<br>• Access 3 – opposite access 2 and this provides access to the northern most area (north of the Springkaanspruit). Access 3 will follow an existing gravel road which traverses the river. It is likely that this will require some works within the river to ensure safe crossing of the river. This may include culverts. If this is required, works within the river will be during the dry period.<br>• Access 4 – this will provide access to the northeastern portion of the facility area – a new access is proposed as the existing access road is too close to Access 2 and 3.<br>• Access 5 – opposite access 1 providing access to the most western portion area of the facility. |
| Grid connection and proximity<br>(Subject to separate authorisation process) | Grid connection will be one of the following options, as shown by the diagram:<br>• Route 1 between the solar PV site and the Uchoba 132kV Substation running South past Dwarsrivier Mine.<br>• Route 2 between the solar PV site and the Uchoba 132kV Substation running North past Dwarsrivier Mine<br>• Route 3 between the solar PV site and Anglo Mototolo Shaft supply substation, named Eskom Der Brochen Substation. Western line.<br>• Route 3 between the solar PV site and Anglo Mototolo Shaft supply substation, named Eskom Der Brochen Substation. Eastern line. |

| INFRASTRUCTURE | DESCRIPTION / DIMENSIONS |
|---|---|
| |  |
| Height of the powerline | Approximately 21 m |
| Height of substation fencing | Fence height to be between 2.5m and 3m, as per the following:<br>Example 1 (including electric fencing):<br>  <br>Example 2 (alternative to electric fence): |

| INFRASTRUCTURE | DESCRIPTION / DIMENSIONS |
|---|---|
| |  |
| Type of fencing | Welded steel chain link mesh, or welded steel mesh, hot-dip galvanised, or Clear-vu (or similar) fence. |

### 2.2.2 Project development phases

The proposed Phula PV project development phases are discussed in more detail in **Table 2-3** below.

**Table 2-3: Project development phases for the proposed Phula PV project**

| PRE-CONSTRUCTION | |
|---|---|
| Pre-planning – legal requirements | • The project will need to comply with the relevant legislation which may require several authorisations, permits, or licences to be obtained prior to the commencement of construction i.e., WUL, tree removal permit etc. Details on the legislation relevant to the project is provided in Section 3 of this report. |
| Conduct surveys prior to construction | • Including, but not limited to confirmation of the micro-siting footprint (i.e., the precise location of the PV panels, on-site facility substation and the associated infrastructure) and a geotechnical survey.<br>• Undertake walk-though of all areas to be developed. Where protected fauna or flora are present on-site, appropriate permitting for the removal or destruction of these species must be undertaken. Walk-through to include the verification and demarcation of bird nests and heritage resources (if any). |
| CONSTRUCTION | |
| Procurement and employment | • The construction phase employment opportunities are short-term and temporary.<br>• The expected construction period is up to 18-months with approximately 250 workers on site at peak (i.e., not at all times). This includes high skilled, medium skilled, and low skilled workers.<br>• Construction period (250 at peak) employment opportunities:<br>• high skilled workers - 10 |

| | |
|---|---|
| | • medium skilled workers - 20<br>• low skilled workers – 220 |
| Establishment of access road/s to the site | • Existing access roads will be utilised where possible to minimise impact and will be maintained where required.<br>• Access road/s (up to 6m in wide) to the site and internal distribution roads (up to 5m wide) between project components to be constructed which includes stormwater channels and turning bypass areas. The length of the internal roads will be determined on the final layout dependent on the technical and environmental requirements.<br>• A welded steel chain link mesh, or welded steel mesh, hot-dip galvanised, or Clear-vu (or similar) fence between 2.5m and 3m will be placed around the project development area with security and access control |
| Undertake site preparation | • This will include the clearance of vegetation. This will require the stripping of topsoil which will need to be stockpiled, backfilled and/or spread on site. |
| Establishment of temporary construction laydown areas | • Construction laydown areas for the storage of components. Temporary store area close to site entrance will be less than 2ha in size. |
| Transport of components and equipment to and within the site | • The existing access roads will be used to transport all components and equipment required during the construction phase.<br>• Typical civil engineering construction equipment will need to be brought to the project site (e.g., excavators, trucks, graders, compaction equipment, cement etc.), as well as components required for the mounting of the PV support structures, construction of the on-site facility substation and site preparation. |
| Erect PV panels, construct substation, invertors, and BESS, and connect PV arrays to the substation | • For array installations, vertical support posts will be driven into the ground. The posts will hold the support structures on which the PV panels would be mounted. Brackets will attach the PV modules to the tables. The foundations of the inverter enclosures and transformers will be prepared. Wire harnesses will connect the PV panels to the electrical collection systems. Underground cables and overhead circuits will connect the Power Conversion Stations (PCS) to the on-site AC electrical infrastructure, and ultimately the on-site facility substation. This process also involves the installation of the BESS. The following sequence is conducted for the construction of a substation:<br>◦ Conduct geotechnical investigation to determine founding conditions.<br>◦ Conduct a site survey.<br>◦ Establish the work zone. This includes placing fencing around the site.<br>◦ Prepare the substation site. This includes vegetation clearance, construction of access roads, site grading and levelling.<br>◦ Excavate and lay the foundations.<br>◦ Install the grounding grid.<br>◦ Build the command building.<br>◦ Backfill the foundations and substation yard.<br>◦ Assemble the steel structures.<br>◦ Install the electrical equipment.<br>◦ Rehabilitate the disturbed area.<br>◦ Testing and commissioning of substation.<br>• The PV arrays will connect to the substation via low and medium voltage electrical cables, to be placed underground where feasible. |

| | |
|---|---|
| Establish ancillary infrastructure | • An Operations and Maintenance building, offices, warehouse/workshop and storage area will be required. The establishment of this infrastructure will require vegetation clearance, levelling, and excavation of foundation prior to construction. |
| Undertake Site Rehabilitation | • Commence with rehabilitation efforts once construction is completed, and all construction equipment is removed.<br>• Access points to the site that will not be required for the operation phase will be closed and prepared for rehabilitation. |
| OPERATION | |
| Procurement and employment | • The construction phase employment opportunities are long-term. However, there are instances where short-term contract opportunities are anticipated.<br>• The operation phase is approximately 35 years with 60 workers (approximately) on site at peak (i.e., not at all times). This includes high skilled, medium skilled, and low skilled workers.<br>• Operation period (60 at peak) employment opportunities:<br>◦ high skilled workers - 4<br>◦ medium skilled workers – 12<br>◦ low skilled workers – 46<br>• Employees that can be sourced from the local municipal area include the low skilled and medium-skilled personnel (such as safety and security staff and certain maintenance crew). Highly skilled personnel may include those recruited from outside the local area where these resources are not available within the area. |
| Operation and Maintenance | • Full time security, monitoring and maintenance. |
| DECOMMISSIONING | |
| Requirements | • Decommissioning the facility at the end of its economic life.<br>• Potential for repowering of the facilities, depending on the condition of the facilities at the time and economic factors.<br>• Decommissioning activities to comply with the legislation relevant at the time. |
| Site preparation | • Confirming the integrity of the access to the site to accommodate the required decommissioning equipment.<br>• Mobilisation of construction equipment. |
| Disassembly and removal of existing components | • Components to be reused, recycled, or disposed of in accordance with regulatory requirements.<br>• Concrete will be removed and will be covered with soil to a depth sufficient for the re-growth of natural vegetation. |
| Components to be disposed of or recycled | • Foundation<br>• PV panels<br>• Wire and steel<br>• Any other component of the facility that may not be readily resold or recycled. |

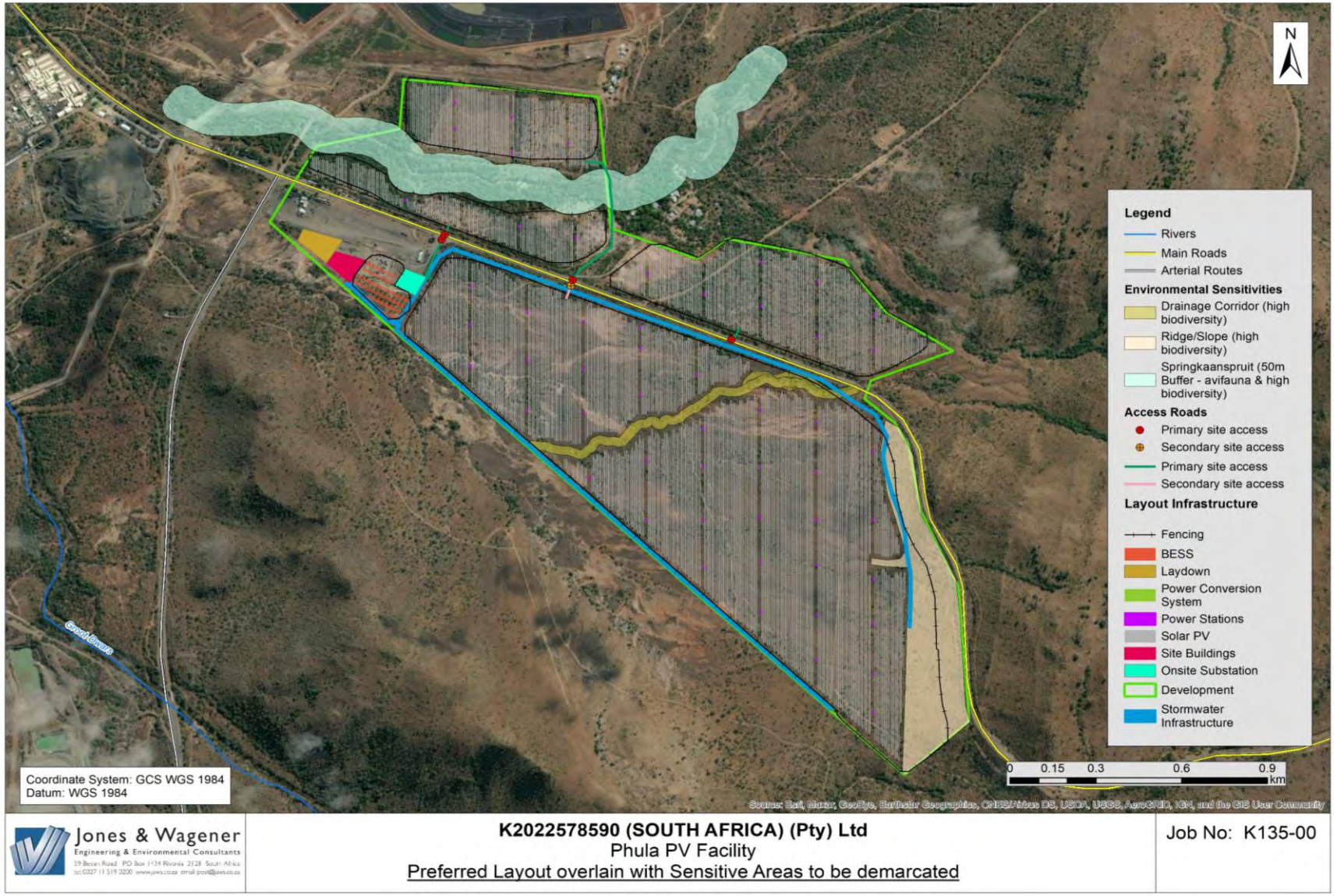



**Figure 2-2: Development layout plan  overlain with sensitive areas to be demarcated**

# 3. LEGAL CONTEXT

Environmental legislation in South Africa was promulgated with the aim of, at the very least, minimising and at the most preventing environmental degradation. The relevant Acts and Regulations applicable to the Phula PV project are outlined below.

## 3.1 Relevant legislations

**Table 3-1** below provides an overview of the environmental legislation applicable to this proposed Phula PV project.

**Table 3-1: Summary of relevant environmental legislation applicable to this project**

| LEGISLATION | COMPETENT AUTHORITY / ORGAN OF STATE | SUMMARY OF RELEVANCE |
|---|---|---|
| Constitution of the Republic of South Africa (1996) | The President and National Executive | The Constitution of the Republic of South Africa provides in the Bill of Rights that: Everyone has the right –<br>a) to an environment that is not harmful to their health or well-being; and<br>b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that –<br>i. prevent pollution and ecological degradation;<br>ii. promote conservation; and<br>iii. secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. |
| National Energy Act (Act 34 of 2008) | DMRE | The aim of, and as noted in the National Energy Act is *"to ensure that diverse energy resources are available, in sustainable quantities and at affordable prices, to the South African economy in support of economic growth and poverty alleviation, taking into account environmental management requirements and interactions amongst economic sectors".* |
| National Environmental Management Act (Act 107 of 1998) (NEMA) | DFFE | The NEMA (as amended) provides the framework for environmental decision-making predominantly though the EIA Regulations (GN No. 362 in the Government Gazette of 8 December 2014, as amended) which serve as the instrument through which development decisions can be made. Specifically, for those developments which trigger certain 'listed activities' identified in GN 327, 325 and 324 (as amended June 2021), that are considered to have potentially detrimental impacts on the environment.<br>Several listed activities are triggered by the proposed project and EA must therefore be sought via a Scoping and Environmental Impact Report (S&EIR) as per the requirements of the EIA Regulations (GN 326 of 2017, as amended in 2021). This Act also sets out various principles that will be adopted in the S&EIR e.g., the precautionary principle, duty of care, and polluter pays principle. |
| National Environmental Management: Air Quality Act (Act 39 of 2004) (NEM:AQA) | SDM | This Act aims to regulate and protect the environment, as noted in this Act, by "*providing reasonable measures for the prevention of air pollution and ecological degradation, and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto*".<br>Specific to the project are the Regulations pertaining to the control of fugitive noise and dust emissions that may arise from the project activities. |

| LEGISLATION | COMPETENT AUTHORITY / ORGAN OF STATE | SUMMARY OF RELEVANCE |
|---|---|---|
| National environmental Management Waste Act (Act 59 of 2008) (NEM:WA) | FTLM, DFFE | A list of waste management activities that have or are likely to have a detrimental effect on the environment have been published in terms of this Act in GN 921 of 2013. Should any listed activities be triggered, a BA or EIA is required to be undertaken for identified listed activities in support of an application for Waste Management Licences.<br>The proposed project does not constitute a Listed Activity requiring a Waste Management Licence (WML) as defined in GNR 921. However, general and hazardous waste should be managed in terms of this act. |
| National Dust Control Regulations (GN 827 of 2013) (NDCR) | SDM | During construction, there will be localised liberation of dust due to excavations and the hauling of materials around the site. The NDCR prescribes general measures for the control of dust in all areas. |
| Occupational Health and Safety Act (Act 85 of 1993) | Department of Labour | Provides for the health and safety of persons at work as well as of those persons connected with the use of plant and machinery. Protects persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work and establishes an advisory council for occupational health and safety. Establishes inspection services, and grants powers to inspectors to investigate and obtain information.<br>The Occupational Health and Safety Officer should ensure that all activities associated with implementation of the project is in compliance with the OHSA |
| National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEM:BA) | DFFE/ LEDET | This Act aims for the management of all biodiversity within South Africa. The 2007 Threatened or Protected Species Regulations (GN R150, as amended) provides protection through a permit system as well as through the identification of restricted activities. If required, the relevant permits will be applied for. The Act also provides for duty of care with regards to control of alien species and provides a list of threatened or protected ecosystems and species in one of the following four categories: critically endangered (CR), endangered (EN), vulnerable (VN), protected (species only), and least threatened (LT).<br>All aspects related to fauna and flora were assessed by relevant specialist and their findings informed the management measures outlined in Section 7.2. Mitigation measures outlined in this section should be adhered to ensure holistic environmental management. |
| National Forests Act (Act 84 of 1998), as amended (NFA) | DFFE | There are 47 protected tree species in terms of the NFA that may not be cut, destroyed, damaged or removed unless a permit has been granted by the DFFE.<br>All aspects related to natural biodiversity associated impacts were assessed by relevant specialist and their findings informed the management measures outlined in Section 7.2. Mitigation measures outlined in this section should be adhered to ensure holistic environmental management. |
| National Heritage Resources Act (Act 25 of 1999) (NHRA) | South African Heritage Resource Agency (SAHRA) and Limpopo Heritage Resources Authority (LIHRA) | In terms of Section 38 of the NHRA, any person who intends to undertake *"any development … which will change the character of a site exceeding 5,000 square metres ($m^2$) in extent", "the construction of a road powerline, or pipeline…exceeding 300 m in length"* must at the very earliest stages of initiating the development notify the responsible heritage resources authority, SAHRA or the relevant provincial heritage agency, of the proposed development.<br>All aspects related to heritage resource associated impacts were assessed by archaeological and palaeontological specialist and their findings informed the management measures outlined in Section 7.2. Mitigation measures outlined in this section should be adhered to ensure holistic environmental management. The chance find procedure outlined in Section 10 should be adhered in case heritage resources are found on site. |

| LEGISLATION | COMPETENT AUTHORITY / ORGAN OF STATE | SUMMARY OF RELEVANCE |
|---|---|---|
| National Water Act (Act 36 of 1998) (NWA) | Department of Water and Sanitation (DWS) | Section 21 of the NWA recognises and defines water uses that require the approval of DWS in the form of a GA or WUL. There are restrictions on the extent and scale of identified activities, determined through the DWS risk assessment matrix, for which GAs apply.<br>There are watercourses that transverse the proposed project site. Triggered water use activities in terms of Section 21 of the NWA may include the following in terms of Section 21 of the Act:<br>(c) Impeding or diverting flows when construction occurs within a watercourse or within the regulated area of a watercourse (500 m of a wetland or 100m from a river);<br>(i) Alteration of the bed or banks of a watercourse of any activities within 500 m of a wetland.<br>The information in the geohydrologist and wetland and aquatic ecologist specialist's report will be used in support of any WUL or GA Applications. Consultation with DWS will inform and confirm the exact water uses applicable to the proposed development. |
| National Road Traffic Act (Act 93 of 1996) (NRTA) | Road Agency Limpopo (RAL) | Certain vehicles and loads cannot be moved on public roads without exceeding the limitations in terms of the dimensions and/or mass as prescribed in the Regulations of the NRTA.<br>Due to the large size of many of the facility's components will need to be transported via "abnormal loads". Staff will also have to be transported to the site on a daily basis. Access to the site will be via existing roads. |
| Civil Aviation Act (Act 13 of 2009) (CAA) | South African Civil Aviation Authority (SACAA) | The CAA provides for the control and regulation of aviation within South Africa. It provides additional measures directed at more effective control of the safety and security of aircrafts, airports and the like, and provide for establishment of SACAA with safety and security oversight functions.<br>All aspects related to visual intrusion associated with the development were assessed by visual specialist and their findings informed the management measures outlined in Section 7.2. Mitigation measures outlined in this section should be adhered to ensure holistic environmental management. |
| Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA) | Department of Agriculture, Land Reform and Rural Development | Implementation of control measures for soil conservation works as well as alien and invasive plant species in and outside of urban areas is provided for in the CARA.<br>All aspects related to natural biodiversity associated impacts were assessed by relevant specialist and their findings informed the management measures outlined in Section 7.2. Mitigation measures outlined in this section should be adhered to ensure holistic environmental management. |

Please note that the above list is not exhaustive, the project owner and contractors must ensure that other relevant provincial legislation and local by-laws applicable to this development are complied with.

# 4. ROLES AND RESPONSIBILITIES

This section outlines the various responsibilities for the implementation of the EMPr during the project implementation phase.

## 4.1 Responsibility matrix

**Table 4-1** below provides a summary of the responsible staff associated with the proposed project.

**Table 4-1: Responsibility matrix**

| ROLE | RESPONSIBILITY |
|---|---|
| Applicant / Developer (Authorisation Holder) | Ensures compliance with the EMPr, EA, licences and/or permits |
| Project Manager (PM) | Overall project management and EMPr implementation |
| Environmental Control Officer (ECO) appointed by Authorisation Holder | Auditing of the implementation of EMPr and EA. |
| Contractor Manager (CM) | Implementation and compliance with recommendations and conditions of the EMPr and EA. |
| Site Manager (SM) | Overseeing of site works, managing of contractor and liaison with PM and ECO. |
| Supervisor: Environment, Health & Safety (EH&S) | Ensures compliance with the EMPr and EA in terms of EH&S |

## 4.2 Responsibilities

### 4.2.1 DFFE

The DFFE is the competent authority (CA) responsible for authorising this EMPr and has overall responsibility for ensuring that the Authorisation Holder complies with requirements of this EMPr, and any conditions listed in the approved EA.

The responsible authority shall:

- be responsible for any significant amendments that may be required to the EMPr;
- undertake random site inspections to check compliance with the EMPr and EA conditions; and
- recommend any further measures in case of non-conformance.

### 4.2.2 Project Manager (PM)

The main responsibility of the PM is to ensure that the contractor complies with the environmental measures prescribed in this document and any conditions from the CA. Additionally, the PM should:

- Assume overall responsibility for the effective implementation and administration of the EMPr and the conditions and requirements of the EA;
- Ensure that the EMPr and EA conditions are included in the contractor's contract;
- Ensure that the applicable supervisor and contractors are provided with the EMPr and EA and any other relevant permit/licence;
- Implement the recommendations made as a result of the annual independent / external audits;
- Monitor the implementation of the EMPr throughout the project by means of site inspections and meetings; and
- Ensure that periodic environmental performance audits are undertaken on the project implementation.

### 4.2.3 Environmental Control Officer (ECO)

The ECO should be employed by the developer for the duration of the project. The ECO should have appropriate training and experience in the implementation of environmental management specifications. The primary role of the ECO is to act as an independent quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts. The ECO's responsibility includes monitoring that the EMPr is implemented, and EA conditions are complied with. In addition to this, the ECO should:

- Conduct regular and comprehensive site inspections / audits, in conjunction with the SM, to monitor whether the contractor is compliant with the EMPr in terms of the actions outlined in the document and with any conditions stipulated in the EA. Inspections must take place monthly and a copy of the inspection checklist must be kept on file;
- Keep a register of all incidents (fuel spills, complaints, injuries, legal transgressions etc.) and of all documentation related to the EMPr;
- Report any problems or complaints, which could not be resolved in collaboration with the CM, to the PM;
- Check that monitoring takes places in accordance with the management measures outlined in the EMPr;
- Compilation of ECO Reports that must be submitted to the project team, DFFE, developer and any other authority/body deemed necessary by the project team; and
- Ensure that all personnel are trained in accordance with the requirements outlined in the EMPr.

The ECO must be an independent and suitably qualified with sound environmental knowledge to understand and implement the EMPr. Details of the appointed ECO must be submitted to the Director: Compliance Monitoring of the DFFE.

### 4.2.4 Contractor Manager.

The Contractor has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract are in line with the EMPr and that Method Statements are implemented as described. External contractors must ensure compliance with this EMPr and the Water Use Licenses (WUL) while performing the onsite activities as per their contract with the PM. The contractors are required, where specified, to provide Method Statements setting out in detail how the management actions contained in the EMPr will be implemented during construction phase activities.

In addition, the Contractor shall:

- Adhere to all conditions of contract, including the EMPr and EA – where a condition in the EA contradicts the EMPr, the condition in the EA supersedes the condition in the EMPr unless otherwise confirmed by the CA in writing;
- Before any construction may commence, ensure that they have a copy of all licenses and permits required in terms of the EA, EMPr and the WULs that were obtained by the Authorisation Holder prior to the Contract being awarded.
- Ensure that they obtain all other outstanding permits required to comply with the requirements of the EA, the EMP and the WULs, in particular the WUL for the extraction of the amount of water he requires from rivers and streams.
- Supply a copy of all required licenses and permits to the Engineer for records.
- Where specified the Contractor shall appoint a suitably qualified professional to carry out a search and rescue of environmentally sensitive/endangered vegetation and prepare all necessary rehabilitation plans.
- Ensure that the environmental actions prescribed in this document (including any revisions, additions and amendments) and the conditions and requirements of the EA are adhered to and effectively implemented. This includes the on-site implementation of mitigation measures to minimise environmental impacts;
- Discuss the implementation of and compliance with the measures contained in the EMPr, with personnel at routine site meetings;
- Monitor environmental performance and conformance with the management measures contained in the EMPr and EA during site inspections;
- Report progress towards implementation of and non-conformances with the management measures contained in the EMPr and EA at site meetings with the PM and / or ECO;
- Inform the EH&S Manager of any incidents or emergencies that occur on site, together with a record of action taken;
- Report and record all accidents and incidents resulting in injury or death to the EH&S manager;
- Consider the legal rights of the surrounding communities and regional stakeholders;
- Ensure quality in all technical and environmental work performed; and
- Utilise this EMPr for the benefit of all parties involved.

### 4.2.5 Site Manager

The SM will be responsible for supervising site works, managing the contractor(s) and ensuring compliance with the EMPr and EA. In addition, the SM should:

- Issue site instructions to the Contractor to ensure compliance with EMPr;
- Conduct regular site inspections, in conjunction with the ECO, to ensure that the contractor is compliant with the EMPr in terms of the management actions outlined in the document. Inspections must take place monthly and a copy of the inspection checklist must be kept on file;
- Ensure monitoring audits are conducted (as per the EA) to ensure compliance with the EMPr; and
- Confine activities to the demarcated construction site, prevent actions that may cause harm to the environment and take steps to prevent pollution on site.

### 4.2.6 Environment, Health and Safety Manager

The EH&S Manager shall:

- Conduct regular site inspections, in conjunction with the SM, to ensure that the contractor is compliant with the EMPr in terms of the management actions outlined in the document. Inspections must take place monthly and a copy of the inspection checklist must be kept on file;
- Keep a register of all incidents (fuel spills, complaints, injuries, legal transgressions etc.) and of all documentation related to the EMPr;
- Report any problems or complaints, which could not be resolved in collaboration with the CM, to the PM; and
- Ensure that all personnel are trained in accordance with the requirements outlined in the EMPr and EA.

## 5. METHOD STATEMENT

The appointed Contractor shall provide the SM with a Method Statement (with input from the ECO if necessary) for all the proposed activities to be undertaken. The Method Statement shall cover applicable details with regards to:

- Scope of work;
- Timing and location of activities;
- Construction of general earthworks including shaping and compaction, and general surface water management;
- Sourcing of borrow material;
- Materials and equipment to be used;
- Getting the equipment to and from site;
- How the equipment / material will be moved while on site;
- How and where material will be stored;
- The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- Compliance / non-compliance with the environmental management measures, and procedures to rectify non-compliances; and
- Emergency response procedures.

The contractor must comply with the approved method statement, and any activity covered in the method statement must not commence without approval from the PM.

Should the required Method Statements note be submitted timeously prior to the commencement of an activity, the activity in question shall be suspended until the Method Statement is approved by the PM.

Any environmental damage caused by the contractor without an approved Method Statement will be for the cost of the contractor, and to the satisfaction of the PM.

Method Statements may include, but are not limited to:

- Site clearing
- Cement and concrete batching
- Wastewater control
- Dust management
- Spoil erosion prevention
- Stormwater management

# 6. GENERAL REQUIREMENTS FOR THE PHULA PV PROJECT

The following general requirements will apply during the project:

- Transparent and continuous liaison between Authorisation Holder, the PM, contractors and landowners to ensure everyone is informed at all times;
- Where applicable, the adjacent landowners will be informed in advance of the starting date of construction;
- All infrastructure shall be protected against damage at all times and any damage shall be rectified immediately;
- Appropriate site management and regular monitoring of site works;
- Thorough documentation and record keeping of all complaints and actions taken;
- Regular site inspections and good control over the construction / closure phase of the project;
- Appointment of relevant personnel to implement this EMPr; and
- Environmental Audits to be carried out as per the frequency specified by the authorities.

# 7. ENVIRONMENTAL MANAGEMENT MEASURES

The management measures documented in each of the sections below have been compiled using the impact assessment and mitigation measures documented in the specialist reports undertaken and the associated EIAr for the proposed Phula PV project.

The management measures have been divided into those applicable during each development phase.

## 7.1 Impact Management Outcomes

**Table 7-1** details the objectives of the specific management activities associated with the proposed Phula PV project.

**Table 7-1: Objectives of the Environmental Measures**

| PROJECT STAGE | OBJECTIVE |
|---|---|
| Planning/Design Phase and Construction initiation | • Ensure that the design phase of the project takes cognisance of environmental sensitivities and opportunities. |
| | • Ensure that all necessary legal obligations and contractual conditions have been met prior to construction commencement.<br>• Ensure that all role players and stakeholders are aware of the pending activities and have received timeous notice.<br>• Ensure that all staff undergo induction and environmental awareness training prior to the initiation of the project.<br>• Ensure that emergency procedures are in place to enable a rapid and effective response to all types of emergencies. |
| | • To ensure that waste is appropriately stored, handled and safely disposed of at a licensed waste facility. |

| PROJECT STAGE | OBJECTIVE |
|---|---|
| | • Ensure proper demarcation of the project area prior to initiation.<br>• Ensure that all areas impacted during construction are rehabilitated.<br>• Ensure that access to no-go areas / demarcated environmental sensitive areas are prevented.<br>• Ensure that activities are limited to the disturbed footprint. |
| Operation phase | • Ensures that operation activities are properly managed in respect of environmental aspects and impacts.<br>• Enables the solar energy facility's operation activities to be undertaken without significant disruption to other land uses in the area, in particular with regard to farming practices, traffic and road use, and effects on local residents.<br>• Ensure that the facility and associated infrastructure is well maintained;<br>• Ensure that all rehabilitated areas are monitored, remedy measures should be applied for any issue identified;<br>• Establishment of clear reporting, communication, and responsibilities in relation to overall implementation of EMPr; |
| Decommissioning Phase | • Use of the construction phase EMPr conditions as a guideline to facilitate the detailed decommission phase;<br>• Ensure the demolishing of any on site infrastructure is undertaken in line relevant building standards and regulations;<br>• All structures, foundations and sealed areas are demolished, removed and waste material disposed of at an appropriately licensed waste disposal site or as requirement by the relevant legislation;<br>• Ensure that all access/service roads not required to be retained by landowners are closed and fully rehabilitated;<br>• All disturbed areas are compacted, sloped and contoured to ensure drainage and runoff and to minimise the risk of erosion; and<br>• Ensure that retrenchments comply with South African Labour legislation. |

## 7.2 Impact Management Actions

**Table 7-2** to **Table 7-5** indicates the management measures to be undertaken during the planning, construction, operational and decommissioning phases for the Phula PV Facility.

Please note that the Authorisation Holder will be held accountable for the implementation of all the management measures below.

**Table 7-2: Planning phase management measures**

| MITIGATION ACTIONS | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| Approvals | | | |
| The EMPr must be seen as a dynamic document. However, any changes to the EMPr, which are environmentally defendable, must be submitted to the authorities for acceptance before such changes may be affected. | Throughout project | When necessary | PM |
| A copy of the EMPr, EA, WUL and other obtained permits/licences must be kept on site in a designated Environmental File. The EMPr, EA, and WUL must be produced to the relevant authorised official(s) upon request and must be made available for inspection by any employee or agent of the holder of the authorisation and licences who works or undertakes work at the property. | Throughout project | Throughout project, with monthly inspection by ECO | ECO<br>PM<br>SM |
| No work shall commence until acceptance of this EMPr (and all required authorisations are licences) from the authorities has been obtained. | Prior to commencement | Once-off | ECO<br>PM |
| A signed agreement must be obtained from the contractor indicating their willingness to comply with the EMPr. | Prior to commencement | Once-off | CM<br>PM |
| Mitigation measures of the Generic EMPr for onsite substation (APPENDIX A) should be adhered to | Throughout project | Throughout project | SM<br>CM<br>PM<br>EH&S<br>ECO |
| Waste management | | | |
| Appoint a waste contractor to remove all construction waste (hazardous and general) to an appropriate, licensed waste management facility (for reuse/recycling or final disposal). | Prior and Through-out construction/closure | Once-off | SM<br>PM<br>EH&S |

| MITIGATION ACTIONS | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| Develop and implement a construction waste management plan for all construction waste, including re-use and recycling. This should include a spill management plan. | Prior to commencement and throughout construction/closure | Throughout project | SM<br>CM<br>PM<br>EH&S |
| Ensure that suitable spill kits and absorption materials are purchased prior to commencement of construction and stored suitably in places where there is a high risk of hazardous spills occurring. | Prior to commencement and throughout construction/closure | Throughout project | SM<br>CM<br>PM<br>EH&S |
| Ensure that portable chemical toilets are installed at the contractor's camp. | Prior to commencement and throughout construction/closure | Throughout project | SM<br>CM<br>PM<br>EH&S |
| Construction site planning | | | |
| All site establishment components must be positioned to minimise the area disturbed. | Throughout project | Throughout | SM<br>CM |
| The contractor must provide the PM with the intended actions and programme for site establishment including the site layouts, demarcation for bunded areas for hazardous material storage, soil stockpiles, excavations, storm water and erosion management measures and access points for machinery and services. | Prior to commencement | Once-off | CM<br>PM |
| All construction activities and laydown areas must be restricted to low sensitivity areas and existing roads must be used to access site where possible and as per the EA. | Prior to commencement and throughout project | Through-out | CM<br>SM |
| Highly sensitive areas to be avoided must be indicated on the site plans and demarcated on site as "no-go" areas/buffer zones, outlined in Figure 2-2. | Prior to commencement | Once-off | PM<br>CM<br>SM |

| MITIGATION ACTIONS | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| | | | EH&S |
| Environmental awareness | | | |
| All personnel and contractors must undergo Environmental Awareness training. A signed register of attendance must be kept as proof and filed in the Environmental File. | Prior to commencement | Once-off | SM<br>CM<br>EH&S |
| Site workers should undergo environmental induction training to address correct conduct and keeping noise levels minimal. | Prior to commencement | Once-off | SM<br>CM<br>EH&S |
| The environmental induction training must address the use and management of sanitation facilities (chemical portable toilets) and general site management and housekeeping. | Prior to commencement | Once-off | SM<br>CM<br>EH&S |
| **Contractor's Yard establishment and Stockpile area** | | | |
| Construction camp and ablution facilities must be located in an approved area that is least visible to the public and must be kept tidy. | Prior to commencement and throughout project | Throughout | SM<br>CM |
| The contractor's yards must be established outside any sensitive areas and siting must be approved by the SM. | Prior to commencement | Once-off | ECO<br>CM<br>SM |
| Terrestrial biodiversity | | | |
| An effective Alien Invasive Awareness and Management Programme should be established, focusing on the identification and removal of pervasive invasive species. | Prior to commencement | Once-off | PM |

| MITIGATION ACTIONS | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| An independent suitably qualified scientist is to be appointed as ECO to oversee works as well as monitor the re-establishment of lost Species of Conservation Concern (SCCs) within the site and proposed stormwater infrastructure. | | | ECO |
| Watercourse | | | |
| Design of naturalised dissipating structures at the final stormwater discharge location into non-perennial system 2 (Central Drainage Corridor) | Prior to commencement | Once-off | PM<br>Engineer<br>ECO |
| The design of the connection between non-perennial system 2 and 4, must be undertaken to ensure that erosion is minimised, and that natural vegetation is established. A Method Statement is required for this work. | | | |
| Re-design of concrete lined channels to not be concrete lined and to include more “natural features”, for example channels to be sinusoidal, attenuation facilities to be included along the channel to dissipate the flow, inclusion of boulders to create varying habitat, and establishment of indigenous vegetation. | | | |
| Aquatic biodiversity | | | |
| Appointment of the Aquatic Specialist or suitably qualified, SACNASP Registered (PriSciNat) person to undertake the bio-monitoring and surface water monitoring as outlined in Section 11.3.1. | Prior to commencement | Once-off | PM |
| Monitoring programme outlined in Section 11.3.1 should be implemented prior to construction phase as this will ensure routine inspections of the aquatic features and habitat. Sites to be monitored:<br>• Springkaanspruit<br>• Dwars River<br>• Unnamed Tributaries<br>Bio-monitoring must be conducted once during the wet summer period and once during the dry winter period in order to mitigate any seasonable variability effects. Surface water assessments will be included within the bio-monitoring programme as it is generally closely interlinked to any sudden changes in bio-monitoring data | Prior to commencement | Biomonitoring – Bi-annual<br>Surface Water – Quarterly | SM<br>EH&S Specialist |
| Boundaries of the development footprint and no-go areas be clearly demarcated prior to the clearing of vegetation to prevent the encroachment of activities into the surrounding natural and sensitive areas | Prior to commencement | Once-off | SM<br>CM |

| MITIGATION ACTIONS | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| | | | EH&S |
| Socio-economic | | | |
| Develop and implement a Health and Safety Plan according to SHEQ best practices for the construction phase. Limit safety risks through design considerations, location of infrastructure and precautionary construction management principles | Prior to commencement | Once-off | CM<br>EH&S |
| Procurement should be focused within the municipal areas and district if such materials, services and equipment are available | Throughout | Throughout | PM<br>CM<br>EH&S |
| The design of administrative buildings should blend in with surrounding environment | Prior to commencement | Once-off | PM<br>Engineer<br>ECO |
| The Social Management and Monitoring Plan outlined in Section 11.3.2 should be adhered to. | Throughout | Throughout | PM<br>SM<br>CM<br>EH&S |

**Table 7-3: Construction management measures**

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| General | | | |
| Mitigation measures on Generic EMPr for onsite substation (APPENDIX A) should be adhered to | Throughout construction/closure | Throughout | PM<br>CM<br>SM<br>EH&S<br>ECO |
| A new access road and crossing must be constructed within the site boundaries This is to be as per the structures design. | Throughout construction/closure | Once-off | CM<br>SM |
| Total construction duration should be 12-18 months. Construction should start after the rainy season. | Throughout construction/closure | Throughout | CM<br>SM |
| Fencing off only the independent PV areas with clamber proof fencing while allowing for semi-permeable fencing options along the site borders and drainage lines, should it be necessary. This will maintain the connectivity between the drainage line and ridge/slope area and adjacent external habitats.<br>Upstream and downstream ends of drainage lines to be left open/fenced with high permeability fencing.<br>Semi-permeable fencing options should be considered for internal fencing to allow movement of small mammals and reptiles through the site.<br>A Method Statement is required for these works. | Throughout project | Throughout | CM<br>SM |
| Laydown and storage areas must be restricted to low sensitivity areas. Materials may not be stored for extended periods of time and must be removed from the project area once the construction/closure phase has been concluded | Throughout construction/closure | Throughout | CM<br>SM<br>EH&S |
| Labour and community | | | |
| The SM shall ensure the following is maintained on site:<br>• A daily site diary;<br>• A non-conformance register; and | Throughout construction/closure | Daily with monthly inspection by EH&S | SM<br>CM<br>EH&S |

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| • Public complaints register. | | | |
| Ensure supervision of employees at all times. | Throughout construction/closure | Through-out | SM<br>CM<br>EH&S |
| All staff must be made aware of the conditions of the EMPr, EA, WUL and other approved permits/licenses through regular toolbox talks with refresher sessions too.. | Throughout project | Through-out | ECO<br>SM<br>CM<br>EH&S |
| Security and access | | | |
| The contractor must provide security and regulate site access 24/7. | Throughout construction/closure | Daily | SM<br>CM |
| No access roads to be constructed across the remaining sections of Central Drainage Corridor (as per provided layout) | Throughout construction/closure | Through-out | SM<br>CM<br>EH&S |
| Waste management | | | |
| Appointed waste contractor to remove all construction waste (hazardous and general) to an appropriate, licensed waste management facility (for reuse/recycling or final disposal) | Prior and Throughout construction/closure | Weekly with monthly inspection by EH&S | SM<br>PM<br>EH&S |
| Ensure that there is sufficient and suitable spill kits and absorption materials are stored suitably in places where there is a high risk of hazardous spills occurring. | Prior to commencement and throughout construction/closure | Throughout project | SM<br>CM<br>PM<br>EH&S |

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| Ensure that portable chemical toilets are installed at the contractor's camp. These toilets must be secured and should be weather-proof. | Prior to commencement and throughout construction/closure | Throughout project | SM<br>CM<br>PM<br>EH&S |
| Ensure that the site is kept tidy with dedicated waste bins/skips and waste must be stored in bunded areas | Throughout construction/closure | Throughout | SM<br>CM<br>EH&S |
| A spill management plan must be compiled prior to construction and put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas | Throughout construction/closure | Throughout | SM<br>CM<br>EH&S |
| Hydrocarbon spills must be cleaned immediately with spill-sorb or similar product in the event that they should occur | Throughout construction/closure | When necessary | CM<br>SM<br>EH&S |
| Drip trays and/or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use | Throughout construction/closure | Continuous | CM<br>SM<br>EH&S |
| Leaking equipment and vehicles must be repaired immediately or be removed from project area to facilitate repair | Throughout construction/closure | When necessary | CM<br>SM<br>EH&S |
| Safety | | | |
| Personal Protective Equipment (PPE) and safety gear appropriate to the task being undertaken must be worn by all site personnel (e.g., hard hats, safety boots, reflective vests, masks etc.). All people working on site must operate in compliance with all safety measures as laid out in the Occupational Health and Safety Act (Act 85 of 1993) (OHSA). | Throughout construction/closure | Throughout | EH&S<br>CM<br>SM |
| Air Quality | | | |

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| Restrict traffic volumes and vehicle speeds to reduce the dust emissions from unpaved roads | Throughout construction/closure | Throughout | CM<br>SM |
| Minimise extent of disturbed areas and early revegetation on exposed areas must be implemented | Throughout construction/closure | Throughout | CM<br>SM |
| Regular dust suppression of roads and storage stockpiles using water sprayers and stabilisation of soils via vegetation, rock cladding or chemicals, if necessary.<br>Water sprayers must be applied to unpaved haul and access roads | Throughout construction/closure | Throughout | SM<br>CM |
| The trucks carrying the waste material must be equipped with covers/tarpaulins to minimise material being dropped off the vehicles or being windblown | Throughout construction/closure | Throughout | CM<br>SM |
| Double handing of material must be avoided as this may generate dust | Throughout construction/closure | Throughout | SM<br>CM<br>EH&S |
| Noise | | | |
| Temporary noise barriers and use 'low noise' equipment (including alternative reversing alarms) must be used where possible | Throughout construction/closure | Throughout | SM<br>CM |
| All diesel-powered equipment must be regularly maintained and kept at a high level of maintenance. This should include the regular inspection and, if necessary, replacement of intake and exhaust silencers. Any change in the noise emission characteristics of equipment should serve as trigger for withdrawing it for maintenance | Throughout construction/closure | Monthly | SM<br>CM |
| Use of vehicle horns should be minimized where possible. | Throughout construction/closure | Monthly | SM<br>CM |
| Project activities must be limited to the prescribed construction times 7:00 am to 17:00 pm | Throughout construction/closure | Daily | SM<br>CM |

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| Should noise related complaints be received, an investigation must be undertaken. The investigation of complaints should include an investigation into equipment that likely result or resulted in noise levels annoying to the community. This could be achieved with source noise measurements. | Throughout construction/closure | When necessary | SM<br>CM<br>EH&S<br>PM |
| Heritage | | | |
| During construction, should chance finds of heritage resources be identified, the ECO should be notified, and construction must halt immediately. | Throughout construction/closure | When necessary | SM<br>CM<br>ECO |
| Chance Find Procedure outlined in Section 10 must be adhered to, in case heritage resources are identified | | | |
| Visual | | | |
| Only clear areas required for the proposed project. | Throughout construction/closure | Throughout | SM<br>CM |
| Ensure that large trees are retained as far as possible, especially along the perimeter of each of the development sections and the R577 tar road. | Throughout construction/closure | Throughout | SM<br>CM |
| Limit vehicle movement to dedicated access roads as far as possible. | Throughout construction/closure | When necessary | SM<br>CM |
| If dust entrainment becomes a visible issue, consider addressing through use of a water cart (if water availability allows). If water is too scarce, consider chemical treatments. | Throughout construction/closure | Throughout | SM<br>CM<br>EH&S |
| Keep a stakeholder register of all impacts to track issues that require further mitigation. | | | |
| Ensure all heavy machinery is contained within the lay-down areas when not in use and regularly serviced to avoid smoke. | | | |
| No fires permitted on site. | | | |
| Ensure that construction waste is regularly collected and contained within the laydown areas and not creating a visual impact | Throughout construction/closure | Weekly | SM<br>CM |

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| | | | EH&S |
| Burying of any waste including domestic waste, empty containers on the site should be strictly prohibited and all waste must be removed to an approved disposal site. | Throughout construction/closure | Throughout | SM<br>CM<br>EH&S |
| Limit night-time lighting to avoid light pollution of nearby lodges and guest houses, unless it is required for security purposes. | | | |
| Concurrent rehabilitation to be undertaken that could include re-vegetation of construction and/or rehabilitated areas underneath or adjacent to panels, and the removal of alien vegetation species. | Throughout construction/closure | Throughout | SM<br>CM |
| Soil | | | |
| Minimise the area of soil disturbance and clearing of vegetation | Throughout construction/closure | Throughout | SM<br>CM |
| Vehicles must remain on designated access routes and no undisturbed areas are to be driven on. | Throughout construction/closure | Throughout | SM<br>CM |
| Access routes must be pegged and clearly demarcated | Throughout construction/closure | Throughout | SM<br>CM |
| Areas that are denuded must be revegetated promptly with the recommended species mix to prevent erosion. | Throughout construction/closure | Throughout | SM<br>CM |
| Ensure all current agricultural (grazing) practices can continue on the remainder of the property and that no current agricultural jobs are lost | Throughout construction/closure | When necessary | CM<br>SM |
| Areas that are compacted must be ripped and vegetated | Throughout construction/closure | Throughout | SM<br>CM |
| Erosion measures must be implemented to prevent stockpile from erosion. Small stockpiles must be covered with a tarpaulin during very windy and wet conditions. | Throughout construction/closure | Throughout | SM<br>CM |
| All vehicles must be maintained in a working order with no hydrocarbon leaks which may result on soil contamination | Throughout construction/closure | Throughout | SM |

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| | | | CM<br>EH&S |
| All vehicles must be stored with oil catchment sumps, or drip trays must be placed below vehicles. | Throughout construction/closure | Throughout | SM<br>CM<br>EH&S |
| Any contamination must be cleaned up immediately by removing the contaminated topsoil and disposing of the soil in a licences waste disposal site. The area where the topsoil was removed must be replaced with commercially sourced topsoil. | Throughout construction/closure | When required | SM<br>CM<br>EH&S |
| Spread absorbent sand on areas where oil spills are likely to occur, such as the refuelling areas. | | | |
| Ensure that construction waste is regularly collected and contained within the laydown areas. | Throughout construction/closure | Weekly | SM<br>CM<br>EH&S |
| Burying of any waste including domestic waste, empty containers on the site should be strictly prohibited and all waste must be removed to an approved disposal site. | Throughout construction/closure | Throughout | SM<br>CM<br>EH&S |
| Undertake annual inspections of site condition to ensure any areas of erosion is identified and repaired prior to the next rainy season. | Throughout construction/closure | Annually | ECO<br>SM |
| Avoid the Springkaanspruit and associated buffers. The buffer should be demarcated prior to the commencement of any activities on site. The demarcation must be regularly checked. | Throughout construction/closure | Throughout | SM<br>CM<br>EH&S |
| Manage stormwater is such a way that water flow concentration is avoided to dissipate the potential erosive forces. | | | |
| If soils are excavated for the footing placement, ensure that the soil is utilised elsewhere for rehabilitation/road building purposes. | Throughout construction/closure | Throughout | SM<br>CM |

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| If dust entrainment becomes a visible issue, consider addressing through use of a water cart (if water availability allows). If water is too scarce, consider chemical treatments on roads to avoid dust. | Throughout construction/closure | Throughout | SM<br>CM<br>EH&S |
| Keep a stakeholder register of all impacts to track issues that require further mitigation. | | | |
| Wetland and riparian areas | | | |
| No vehicles or activities, dumping or clearing is permitted within areas that are declared as no-go areas. | Throughout construction/closure | Throughout | SM<br>CM |
| Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events | Throughout construction/closure | Throughout | SM<br>CM |
| Clean up any sediment spills or contamination immediately to minimise potential hazardous impacts | Throughout construction/closure | When necessary | CM<br>SM<br>EH&S |
| If erosion occurs, corrective actions (erosion berms) must be taken to minimise any further erosion from taking place | Throughout construction/closure | When necessary | SM<br>CM |
| The non-perennial river 1 (Springkaanspruit) and associated 50 m avifaunal buffer and portions of non-perennial river 2 and 4 and associated 38 m buffer (Central Drainage Corridor), which have been avoided as part of the Phula PV project development layout, should be cordoned-off to prevent access to this area, by people or vehicles, during the construction phase, The demarcation must be undertaken prior to any construction activities may commence on site. | Throughout construction/closure | Throughout | SM<br>CM<br>EH&S |
| Sediment traps must be installed to prevent sediment, from the upstream cleared areas, entering the remaining river systems | Throughout construction/closure | Throughout | SM<br>CM |
| The construction activities are to be undertaken during the dry season, as far as possible. | | | |
| The laydown of the contractor camp is to be located outside of the delineated boundaries of non-perennial rivers 1 (Springkaanspruit), 2 and 4 (Central Drainage Corridor), (as specified), with no other camps to be erected | | | |

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| Areas which are to be cleared of vegetation, including contractor laydown areas, must remain within the designated footprints and be as small as possible | | | |
| Only vehicles, equipment and personnel that have been authorised should be allowed within the construction areas. Additionally, vehicles must be regularly maintained and ensure they are in good working order which will largely reduce spills and leakages that may occur. Where vehicles are kept on site, they should ensure drip trays are placed underneath stored vehicles to ensure no runoff and contamination into groundwater and watercourses | Throughout construction/closure | Throughout | SM<br>CM<br>EH&S |
| Establishment of indigenous vegetation and a variation of habitat types within artificial channel, at the intersection of the artificial channel and the non-perennial system 2 (Central Drainage Corridor), as well as adequate measures to ensure dissipation and attenuation of flow to provide natural pools of water and facilitate sediment control | Throughout construction/closure | Throughout | SM<br>CM<br>ECO |
| Exposed soil/ soil stockpiles associated with the Phula PV project, upgradient of the remaining non-perennial rivers should be protected (e.g., use of bunds) in order to limit erosion and sedimentation to the rivers adjacent and downgradient.<br>The time at which soil is exposed is limited as far as possible which will prevent both transported and air-borne sediment from entering into the non-perennial rivers | Throughout construction/closure | Throughout | SM<br>CM<br>EH&S |
| Stockpiled soil should not exceed 2 m in height | Throughout construction/closure | Throughout | SM<br>CM |
| Excavation of pits for the foundation of solar panels and support structures may result in loose sediments within the landscape, specifically if construction activities are undertaken during the wet season or subject to intense rainfall events (if applicable). Sediment traps can be created by pegging an appropriate geotextile that can be held down by cobbles/boulders or a similar mitigation measure such as a geotextile wrapped hay bales, which spans the work area | | | |
| During excavation of the foundations to facilitate support structures, soil must be stockpiled upgradient of the excavated pits, ensuring that mixture of the lower and upper layers of the excavated soil should be kept to a minimum. These soils must be used to close off the excavated pits, immediately after installation of the support structures | | | |
| Implement and maintain an Alien and Invasive Plants (AIP) management programme (Appendix C of this EMPr), during the construction and operational phase of the Phula PV project | Throughout construction/closure | Throughout | SM |

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| Any concrete can be toxic to freshwater habitat and associated biota. Proper handling and disposal is imperative to minimize discharges into the non-perennial rivers situated adjacent and downgradient. High alkalinity associated with cement can thus affect and contaminate soils, surface and ground water. | | | CM<br>EH&S |
| The following should be adhered to when aiming to minimise cement related impacts on freshwater environment:<br>• Fresh concrete should not be mixed near the proximity of the remaining non-perennial rivers and associated buffer zones, as applicable;<br>• The mixing of cement should be undertaken within the construction camp and may not be mixed on bare soil;<br>• Mixing of concrete is also to be strictly undertaken within a lined, bound or bunded portable mixer with the consideration of using ready mix concrete;<br>• A batter board or other suitable impermeable platform/mixing tray is to be provided onto which any mixed concrete can be deposited whilst it awaits placing;<br>• Washout areas should be designated outside of the confines of the remaining non-perennial rivers and wash water should be treated on-site or discharged to a suitable sanitation system ensuring that wash water is not released directly into the rivers or the artificial stormwater diversion;<br>• Any cement bags must be disposed of in the demarcated hazardous waste receptacles;<br>• Concrete spillage outside of the areas of application must be promptly removed and taken to a suitably licenced waste disposal site | | | |
| Aquatic biodiversity | | | |
| It is essential that a monitoring programme in Section 11.3.1 is implemented as this will ensure routine inspections of the aquatic features and habitat. Continuous awareness should be implemented by the ECO during the construction activities to ensure that impacts will not modify aquatic habitat and biota to such an extent that the present or future desired state of the watercourses would be compromised.<br>Sites to be monitored:<br>• Springkaanspruit<br>• Dwars River<br>• Unnamed Tributaries | Continuous | Biomonitoring – Bi-annual<br>Surface Water – Monthly | SM<br>EH&S<br>Specialist |

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| Bio-monitoring must be conducted once during the wet summer period and once during the dry winter period in order to mitigate any seasonable variability effects. Surface water assessments will be included within the bio-monitoring programme as it is generally closely interlinked to any sudden changes in bio-monitoring data | | | |
| Rehabilitation of the proposed road crossings after construction to minimise impact on wider river reaches of the watercourses | After construction | Throughout | SM<br>CM<br>EH&S |
| Proposed stormwater management plan which includes "soft vegetated channels" (where possible), and bio-retention areas should be implemented | Throughout construction/closure | Throughout | CM<br>SM |
| Structures at road crossings should consist of nothing more than low water crossings that will not impede water or sediment movement | Throughout construction/closure | Throughout | CM<br>SM<br>EH&S |
| Boreholes should be sited away from surface water features to ensure no impact on the flow and sanitation services should be linked to municipal lines or the use of septic tanks that is emptied on an as-and-when needed basis | Throughout construction/closure | Once-off | |
| Highly sensitive features within the buffer zones such as the Springkaanspruit must maintain the 15 m buffer with strict control measures to ensure and prevent any degradable impact occurs on these systems. | Throughout construction/closure | Throughout | |
| Terrestrial Flora and Fauna | | | |
| Effectively control alien plants as part of the alien vegetation management plan to be implemented.<br>• Alien invasive plant material should be removed from the site to reduce the potential for re-establishment.<br>• Ongoing management as part of the alien invasive management programme.<br>• The Alien Invasive Management Plan will need to be applied broadly to the entire footprint to effectively reduce alien invasive species and prevent their recolonisation of cleared areas | Throughout project | Continuous | SM<br>CM<br>EH&S |
| No trapping, killing or poisoning of any wildlife is permitted. No harvesting of plants, plant material, animal or surface water may be allowed | Throughout project | Throughout | SM<br>CM |
| Speed limits should be strictly enforced on-site to minimize the risk of roadkill. Driving during nighttime should be restricted so far as possible | Throughout construction/closure | When necessary | SM<br>CM |

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| Restrict all movement to designated sensitive areas earmarked for avoidance. These must be clearly demarcated as "No Access" areas | Throughout project | Throughout | SM<br>CM<br>EH&S |
| Fence designs utilized for the construction of the development site, should be highly visible to birds and be regularly tensioned to reduce the risk of bird entanglements and collisions. The use of barbed or razor wires must be avoided so far as possible | Throughout construction/closure | When necessary | SM<br>CM |
| Care should be taken to avoid the propagation or introduction of weeds and alien plant species during the construction phase. | Throughout construction/closure | Throughout | SM<br>CM<br>EH&S |
| All vehicle and machinery activities on-site should be strictly controlled to reduce the impacted area to an absolute minimum | Throughout construction/closure | Throughout | SM<br>CM |
| Any bird fatalities recorded on-site during the construction phase should be documented in detail and reported to an avifaunal specialist for advice on any appropriate mitigation measures | Throughout construction/closure | Throughout | SM<br>CM<br>EH&S<br>Specialist |
| Sensitive areas (i.e., drainage line and ridge/slope area) to be avoided to maintain ecological functionality and provide refugia for species no longer able to survive in areas to be transformed. | Throughout construction/closure | Throughout | SM<br>CM<br>EH&S |
| Strict implementation of "No access" to the identified sensitive areas (i.e., drainage line and ridge/slope area). Create connectivity between ridge/slope and drainage line, as well as connectivity between the drainage line and adjacent habitats downstream, through effective natural stormwater channels/paddocks and bioretention ponds. Please also refer to the fencing mitigations above to improve connectivity | | | |
| Road verges and berms should be capped with topsoil to allow for natural vegetation to establish | Throughout construction/closure | Throughout | SM<br>CM |
| A suitable storm water management plan will need to be implemented to control the water runoff within the site and prevent erosion and sedimentation build up within drainage lines. This will need to consider the sensitive drainage line identified as an avoidance area | Throughout construction/closure | Throughout | SM<br>CM |

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| • Stormwater channels should be natural as far as possible to create additional natural habitat and provide suitable corridors for amphibian and other faunal species. In addition, a V-drain and paddock system should be implemented to allow for sediment trapping and natural succession. This should be a focus to connect the Ridge/slope area with the sensitive drainage line identified in the southern portion of the site.<br>• Flow dissipation measures to be installed at the lower extremities of the stormwater system.<br>• Berms built for flood protection of the PV facility, should be sown with naturally occurring grass. | | | |
| Bulk of vegetation clearing and earthworks to be completed at the end of the dry season to reduce erosion from water runoff. | Throughout construction/closure | Throughout | SM<br>CM<br>EH&S |
| In PV areas, compacted soil to be ripped and tilled following construction and sown with natural grasses such as *Cynodon dactylon*, which will stabilise the highly erodible soils (grass height: 400mm). Note: Without re-seeding, grass heights will exceed 1 m should the site be allowed to revegetate naturally. Re-seeding will allow the establishment of invertebrate communities and will allow the grass to produce seed which will improve the ecological functionality, as grass will not need to be cut. | | | |
| Groundwater | | | |
| The spill management outlined in Section 8 should be adhered to. | Throughout construction/closure | Throughout | SM<br>CM<br>EH&S |
| Spill-sorb or a similar product must be kept on site and used to clean up hydrocarbon spills in the event that they should occur. | | | |
| Construction equipment and vehicles must be serviced and refuelled off-site. | Throughout construction/closure | Throughout | SM<br>CM |
| Any contamination must be cleaned up immediately by removing the contaminated topsoil and disposing of the soil in a licences waste disposal site. The area where the topsoil was removed must be replaced with commercially sourced topsoil. | Throughout construction/closure | Once-off | SM<br>CM<br>EH&S |
| Spread absorbent sand on areas where oil spills are likely to occur, such as the refuelling areas. | | | |
| Groundwater levels should be monitored regularly and adhere to sustainable yield | Throughout construction | Quarterly | SM<br>CM<br>EH&S |

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| Surface water and Stormwater Management | | | |
| A suitable naturalised storm water management plan must be implemented to control the water runoff and potential pollution into water sources. This will need to consider the sensitive drainage line to be avoided. | Throughout construction/closure | Throughout | SM<br>CM |
| Emergency repairs to construction vehicles must take place only in dedicated areas that are equipped with drip trays. | Throughout construction/closure | Throughout | CM<br>SM |
| No routine repairs or servicing of construction vehicles will be permitted on site. | Throughout construction/closure | Throughout | CM<br>SM |
| Bunded containment and settlement facilities must be provided for hazardous materials, such as fuel and oil and for dirty construction activities requiring containment of storm water, such as servicing areas and workshops. | Throughout construction/closure | Throughout | CM<br>SM |
| Vehicles to be adequately maintained and fitted with drip trays when left standing. It is advisable that spill kits are available on site. | Throughout construction/closure | Once-off | CM<br>SM |
| Minimise footprint of disturbance and contaminated areas as far as possible | Throughout construction/closure | Throughout | CM<br>SM |
| Use of chemical toilets must be made for sewage management | Throughout construction/closure | Throughout | CM<br>SM<br>EH&S |
| Erosion protection measures must be implemented at areas of concern in conjunction with a canal/berm system to collect contaminated surface runoff and direct this water to an adequately sized, temporary silt trap/sump during the construction process to be monitored before release. | Throughout construction/closure | Throughout | CM<br>SM |
| Water quality must be monitored downstream and upstream of construction areas before and during construction where practical, in order to detect any increase in suspended solids or turbidity. If the water quality monitoring indicates an increase in suspended solids, water management around the construction areas must be reviewed and upgraded. | Throughout construction/closure | Monthly | CM<br>SM<br>EH&S<br>PM<br>Specialist |

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| Temporary storm water collection sumps will be provided to allow suspended solids in the storm water to settle before releasing the storm water to the catchment. | Throughout construction/closure | Throughout | CM<br>SM |
| Traffic | | | |
| Only existing roads and those constructed within the site boundary are to be used by construction vehicles. | Throughout construction/closure | Throughout | SM<br>CM<br>EH&S |
| Component delivery to/ removal from the site can be staggered and trips can be scheduled to occur outside of peak traffic period | | | |
| The use of mobile batching plants and quarries near the site would decrease the impact on the surrounding road network, if available and feasible | | | |
| Staff and general trips should occur outside of peak traffic periods | | | |
| Socio-economic | | | |
| The Social Management and Monitoring Plan outlined in Section 11.3.2 should be strictly adhered to. | Throughout construction/closure | Throughout | SM<br>CM<br>EH&S |
| Prioritise any possible new local labour in the recruitment process as part of the company's own recruitment policy or as part of the contractor management plan and stipulate the procurement of new employees, especially in the unskilled category, from the local communities | Throughout construction/closure | Throughout | PM<br>CM |
| Procurement should be focused within the municipal areas and district if such materials, services and equipment are available | | | |
| Make use of any existing databases of available workers and include the legal local representatives, local municipalities and other legally established community structures in the process | | | |
| Communication efforts concerning job creation opportunities at the PV facility should refrain from creating unrealistic expectations. Job opportunities must be clearly communicated | | | |

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| Outside contractors are likely to be housed in Steelpoort, Mashishing, Burgersfort and other urban areas where there is availability. Existing accommodation facilities on the farm De Grooteboom can also be utilised if avaialable. | | | |
| The workers are expected to be transported to site on a daily basis, where feasible | | | |
| Employment of unskilled individuals, that will form the bulk of the construction workforce, from the local communities will limit the need for additional temporary accommodation | | | |
| The project proponent and contractors should create conditions that are conducive for the involvement of entrepreneurs, small businesses, and SMME's during the construction process of the PV facility | Throughout construction/closure | Throughout | PM<br>SM<br>CM<br>EH&S |
| Fencing of the property, lighting, cameras, and 24-hour security to be installed and implemented to improve security at and around the site. In addition to these measures, | | | |
| Contractors, sub-contractors and construction workers must be trained in health and safety policies, environmental awareness and emergency preparedness | | | |

**Table 7-4: Operational management measures**

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| Waste | | | |
| Good housekeeping must be maintained on site | Throughout project | Throughout | PM<br>SM<br>EH&S |
| Ensure that suitable spill kits and absorption materials are stored suitably in places where there is a high risk of hazardous spills occurring | | | |
| Hazardous substances must be stored in sealed containers within a clearly demarcated designated area | | | |
| Waste handling, collection, and disposal operations must be managed and controlled by a waste management contractor | | | |

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| The storage of batteries, associated with the proposed PV panels, will comply with the National Norms and Standards for the Storage of Waste. | Lifespan of solar PV panels | Throughout | EH&S<br>PM |
| Visual | | | |
| Visible site problems, such as erosion, should be rectified as soon as possible as part of the ongoing maintenance of the site. | Ongoing | Throughout | PM<br>SM<br>EH&S |
| As part of the maintenance of the site, grass should be cut and removed/baled rather than burned to avoid a visual smoke impact and to ensure that there is always adequate vegetative cover. | Ongoing | Monthly | SM<br>EH&S |
| Establish visual screening by planting indigenous trees along the perimeter of the facility | Ongoing | Throughout | PM<br>CM<br>EH&S |
| Seed mix to be adjusted to utilise shade tolerant species under the solar panel areas. | Ongoing | Throughout | PM<br>CM<br>EH&S |
| The solar panel unit must be painted in nonreflective paint as far as possible. | Ongoing | Once-off | PM<br>EH&S |
| Soil | | | |
| The rehabilitated area must be monitored quarterly for compaction, fertility, and erosion. If erosion occurs, corrective actions (erosion berms) must be implemented to reduce further erosion from taking place | Ongoing | Quarterly | PM<br>EH&S |
| Wetland and riparian areas | | | |
| The emergence of the alien plant species must be monitored, and action undertaken in accordance with an alien vegetation management plan | Ongoing | Monthly | PM<br>EH&S |

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| If erosion occurs, corrective actions (erosion berms) must be implemented to reduce further erosion from taking place | Ongoing | As necessary | PM<br>EH&S |
| Any stormwater that forms part of the Phula PV project must not be concentrated and it should be ensured that flows remain diffuse at the outlets of any culverts. This can be achieved by installing dissipators to reduce flow before entry into the downgradient landscape, specifically non-perennial river 2 (Central Drainage Corridor) and portions downgradient outside the proposed project site | Throughout project | Regularly (specifically after rain) | PM<br>CM |
| The BESS and substation are recommended to be regularly inspected to ensure no leakages and spills occur which should be immediately reported to the environmental manager if identified. It is recommended that an emergency spill kit and contingency plan is put in place in the event of any spills of hydrocarbons occur so as to reduce ingress at the confluence of the non-perennial rivers downgradient | Ongoing | Regularly | PM<br>SM<br>EH&S |
| Establish vegetation on the ground underneath the solar panels with indigenous grasses in order to reduce sedimentation that may occur from bare, exposed areas | Ongoing | As necessary | SM<br>EH&S |
| Any maintenance vehicles used must be in good working order and ensure there are no spills or leaks occurring whilst undertaking maintenance work. Drip trays are recommended to be placed underneath maintenance vehicles when they are parked | Throughout | Throughout | SM<br>EH&S |
| Should erosion be noted at the base of the support structures, this may potentially impact on the non-perennial rivers situated adjacent. These areas must be adequately rehabilitated by infilling and stabilising/plugging erosion gullies, resurfacing disturbed areas and revegetating these areas with suitable indigenous vegetation | Throughout | When required | SM<br>EH&S |
| The movement of maintenance vehicles along internal access roads should be minimised to what is essential for the completion of the necessary maintenance activities and should not be allowed to drive indiscriminately through the surrounding areas or within the associated buffers of the Springkaanspruit and the remaining sections of non-perennial river 2 and 4 (Central Drainage Corridor) | Throughout project | Throughout | SM<br>EH&S |
| Sufficient separation of clean and dirty water systems should be undertaken with specific mention to areas associated with the BESS and laydown areas. Dirty water cannot be released to the downstream environment unless a WUL has been obtained and the conditions in the WUL adhered to | Throughout project | Throughout | SM<br>EH&S |

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| Terrestrial Flora and Fauna | | | |
| Alien plant species must be monitored effectively, by compilation and implementation of an alien vegetation management plan | Ongoing | Monthly | PM<br>SM<br>ECO |
| Monitoring needs to be conducted of vegetation communities within these areas during the post-closure phase in order to assess the state of rehabilitation. | 1 year after construction | Monthly | PM<br>SM<br>ECO |
| Reactive management for bird electrocutions is recommended. Any electrocutions occurring on substations or associated infrastructure should be documented in detail and reported to an avifaunal specialist for the relevant mitigation measures | Throughout project | Throughout | PM<br>SM<br>EH&S |
| No trapping, killing or poisoning of any wildlife is permitted | Throughout project | Throughout | PM<br>SM<br>EH&S |
| If any bird activity (e.g., breeding or roosting) occurs which impedes on the operations of the project, a detailed report must be documented and presented to an avifaunal specialist for consultation on the relevant mitigation measures. Both current and any new nest sites, especially of species of conservation concern, should be managed in accordance with the relevant environmental legislations | Once | When necessary | PM<br>SM<br>EH&S |
| The use of rodenticides should be avoided both on-site and around any infrastructure associated with the construction and operation of the development. Whilst effective, the toxic nature of these rodenticides carries an unnecessary secondary poisoning risk to predatory avifauna, especially owls and species prone to scavenging. | Throughout project | Throughout | SM<br>EH&S |
| Environmentally friendly cleaning chemicals should be used on-site in conjunction with carefully planned management of surface water and drainage systems | Throughout project | Continuous | SM<br>EH&S |
| Any bird fatalities recorded on-site during the operational phase should be documented in detail and reported to an avifaunal specialist for advice on any appropriate mitigation measures | Throughout project | When necessary | SM<br>EH&S<br>Specialist |

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| The best practice guidelines recommendation of at least one year of operational phase monitoring should be followed | At least one year | Monthly | SM<br>EH&S |
| Lighting at the PV facility should have appropriate shielding or make use of downward directional fixtures with low intensity lighting | Throughout project | Throughout | SM<br>EH&S |
| Chemical use for the control of vegetation growth to be done in accordance with recommended guidelines | | | |
| Aquatic biodiversity | | | |
| Buffer zones such as the Springkaanspruit must maintain the 15 m buffer with strict control measures to ensure and prevent any degradable impact occurs on these systems | Throughout | Throughout | SM<br>EH&S |
| It is essential that a monitoring programme in Section 11.3.1 is implemented as this will ensure routine inspections of the aquatic features and habitat. Continuous awareness should be implemented by the ECO during the construction activities to ensure that impacts will not modify aquatic habitat and biota to such an extent that the present or future desired state of the watercourses would be compromised.<br>Sites to be monitored:<br>• Springkaanspruit<br>• Dwars River<br>• Unnamed Tributaries<br>Bio-monitoring must be conducted once during the wet summer period and once during the dry winter period in order to mitigate any seasonable variability effects. Surface water assessments will be included within the bio-monitoring programme as it is generally closely interlinked to any sudden changes in bio-monitoring data | Continuous | Biomonitoring – Bi-annual<br>Surface Water – Quarterly | SM<br>EH&S<br>Specialist |
| Surface water | | | |
| Continue to monitor downstream and upstream water quality. | Throughout | Monthly | EH&S<br>PM<br>Specialist |

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| Visual inspection and monitoring of storm water infrastructure must be undertaken at the toe the final landform to ensure that there is no erosion alongside them. The flow paths will periodically need to be desilted to ensure that the flow depth is maintained, and large vegetation growth removed to prevent the flow paths from blocking. | Throughout | Monthly | EH&S<br>PM |
| Groundwater | | | |
| Groundwater levels should be monitored regularly and adhere to sustainable yield | Throughout construction | Quarterly | SM<br>CM<br>EH&S |
| Socio-economic | | | |
| Maximise the employment of locals where the required skills are available | Throughout | Throughout | PM<br>SM |
| Skills development and on-site training would be imperative to enhance capacity building and equipping employees with transferable skills | | | |
| Develop a database of goods and services that could potentially be outsourced to the local community as part of the PV facility operation | | | |
| Establish supply links with localised suppliers | | | |
| Suitable accommodation facilities would be required for the employees and their families.<br>Incorporate the additional need for housing as part of the municipality's overall planning strategy. | | | |
| If any legitimate land claim with regards to the property is legally settled in future, it must be dealt with accordingly | | | |

**Table 7-5: Decommissioning management measures**

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| Visual | | | |
| Visible site problems, such as erosion, should be rectified as soon as possible as part of the ongoing maintenance of the site. | Ongoing | Throughout | SM<br>cM<br>EH&S |
| Ensure the disturbed footprints are returned to land that can support grazing practices and per the current farming practices. | Ongoing | Throughout | CM<br>PM<br>EH&S |
| If bare areas are apparent, re-seed with indigenous seed mix relevant to the study area | | | |
| As part of the maintenance of the site, grass should be cut and removed/baled rather than burned to avoid a visual smoke impact and to ensure that there is always adequate vegetative cover. | Ongoing | Monthly | CM<br>SM<br>EH&S |
| Soil | | | |
| The rehabilitated area must be monitored quarterly for compaction, fertility, and erosion. If erosion occurs, corrective actions (erosion berms) must be implemented to reduce further erosion from taking place | Ongoing | Quarterly | PM<br>EH&S |
| Ensure the disturbed footprints are returned to land that can support grazing practices and per the current farming practices | Decommissioning | Monthly | PM<br>EH&S<br>Rehabilitation specialist |
| If bare areas are apparent, re-seed with indigenous seed mix relevant to the study area | | When required | |
| Ensure all compacted footprints are ripped 150mm deep (where rocks allow) | | When required | |
| Wetland and riparian areas | | | |
| The emergence of the alien plant species must be monitored, and action undertaken in accordance with an alien vegetation management plan | Ongoing | Monthly | PM<br>SM<br>ECO |

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| If erosion occurs, corrective actions (erosion berms) must be implemented to reduce further erosion from taking place | Ongoing | As necessary | PM<br>EH&S |
| Terrestrial Flora and Fauna | | | |
| Alien plant species must be monitored effectively, by compilation and implementation of an alien vegetation management plan | Ongoing | Throughout | PM<br>SM<br>ECO |
| Monitoring needs to be conducted of vegetation communities within these areas during the post-closure phase in order to assess the state of rehabilitation.<br>It is recommended to specify that an acceptable grass cover shall mean that not less than 75% of the hydroseeded area shall be covered with grass. The maintenance period in respect of grass shall commence when an acceptable grass cover as defined above has been established and shall be 12 months. | 1 year after closure | Quarterly | SM<br>EH&S<br>ECO |
| Rehabilitated areas must be monitored for any erosion. If erosion occurs, corrective actions (erosion berms) must be implemented to reduce further erosion from taking place | 2 years after closure | Quarterly up | SM<br>EH&S<br>ECO<br>Rehabilitation specialist |
| No trapping, killing or poisoning of any wildlife is permitted | Throughout project | Throughout | SM<br>CM<br>EH&S |
| Aquatic biodiversity | | | |
| Buffer zones such as the Springkaanspruit must maintain the 15 m buffer with strict control measures to ensure and prevent any degradable impact occurs on these systems | Throughout | Throughout | SM<br>CM<br>EH&S |
| It is essential that a monitoring programme in Section 11.3.1 is implemented as this will ensure routine inspections of the aquatic features and habitat. Continuous awareness should be implemented by the ECO | Continuous | Biomonitoring – Bi-annual | SM<br>EH&S |

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| during the construction activities to ensure that impacts will not modify aquatic habitat and biota to such an extent that the present or future desired state of the watercourses would be compromised.<br>Sites to be monitored:<br>• Springkaanspruit<br>• Dwars River<br>• Unnamed Tributaries<br>Bio-monitoring must be conducted once during the wet summer period and once during the dry winter period in order to mitigate any seasonable variability effects. Surface water assessments will be included within the bio-monitoring programme as it is generally closely interlinked to any sudden changes in bio-monitoring data | | Surface Water – Quarterly | Specialist |
| Surface water | | | |
| Continue to monitor downstream and upstream water quality. | Decommissioning | Monthly | EH&S<br>SM<br>Specialist |
| Visual inspection and monitoring of storm water infrastructure must be undertaken at the toe the final landform to ensure that there is no erosion alongside them. The flow paths will periodically need to be desilted to ensure that the flow depth is maintained, and large vegetation growth removed to prevent the flow paths from blocking. | Decommissioning | Annually | EH&S<br>SM |
| Socio-economic | | | |
| Replace technology and infrastructure with newer technology and infrastructure to extend the life of the facility. | Decommissioning | When required | CM<br>SM |
| The project proponents must develop mechanisms to assist employees, prior to the retrenchment date, and in the transition phase after closure of the facility. This can include offering portable skills development programmes during the operational phase, and by providing assistance in accessing available and suitable jobs with other PV facilities or companies. | | As necessary | PM<br>EH&S |
| Focus on non-core related local supply links during the operational phase to facilitate easier transitioning of local suppliers to other industries | | Throughout | PM<br>CM<br>SM |

| MITIGATION: ACTION | DURATION OF IMPLEMENTATION | FREQUENCY OF MONITORING IMPLEMENTATION | RESPONSIBLE PERSON FOR IMPLEMENTATION |
|---|---|---|---|
| Safety controls and measures must be put in place to avoid unauthorised entry to the site. | | | CM<br>SM |
| Recycling or refurbishment of materials and panels | | | CM<br>SM |
| Discarding of materials must be sufficiently dealt with in a feasible and environmentally sound way. Safe disposal of all types of material (wires, invertors, racking systems, fencing) | | Weekly | CM<br>SM |
| Toxic Characteristic Leaching Procedure (TCLP) tests can be undertaken on panels to determine how and where panels can be disposed of at a landfill | | When required | SM<br>CM<br>EH&S |
| Vehicles must be in good working order and drivers have to keep to speed limits to limit safety risks and minimise noise and dust pollution created by heavy vehicle movement | | Throughout | |

***Note: The relevant mitigation measures contained under the construction section should be applied during decommissioning, hence some are repeated in this section.***

# 8. EMERGENCY PREPAREDNESS AND RESPONSE PLAN

The emergency preparedness and response plan serves to guide for the implementation measures for any emergency that may occur during the development phases of the project and to ensure compliance with the NEMA as well as other applicable legislations.

## 8.1 Hazard analysis

The following hazards could occur at the Phula PV site during the construction/closure phase:

- Fires: structural fires, chemical fires, hydrogen fires, diesel fuel oil fires, electrical fires, , veld fires, vehicle and machine fires;
- Diesel fuel oil/chemical spillages;
- Injury on site: personal injury accidents and motor vehicle collisions;
- Critical auxiliary equipment failures;
- Power outages resulting in property damage or resulting in a situation that endangers the life of employees;
- Crime, resulting in theft, damage to property and loss to life.

This list is not exhaustive and other influencing dynamics on site must always be considered.

## 8.2 Prevention

A number of actions must be undertaken to eliminate or minimize hazards.

### 8.2.1 General housekeeping

Overall, good general housekeeping should be observed and practiced at all times on site. Access roads and all entry/exist points should be kept clear of obstructions. Chemicals should be stored in suitable storage containers and containment areas, clearly marked and locked as required.

### 8.2.2 Fire prevention and fire extinguishers

Fire extinguishers and other firefighting equipment must be clearly visible and accessible. All personnel must receive training on the correct use of this equipment. And all equipment should be inspected, serviced and tested according to the manufacturer's specification or relevant standards.

### 8.2.3 Materials handling and storage

Materials required in construction operations shall be stored and handled in a manner to prevent deterioration and damage to the materials, ensure safety of workmen in handling operations and non-interference with public life including safety of public, prevention of damage to public property and natural environment. The following shall be taken into consideration for storage areas:

- Located away from sensitive receptors;
- No potential health and safety risks for the employees on site;

- Easily accessible in a safe manner;
- Stacked on a well-drained, flat and unyielding surface;
- Well ventilated (i.e., storage in a closed area);
- Not likely to be damaged.
- Well bunded and with spill kit close by (i.e., in hazardous storage area).

Materials shall be separated according to kind, size and length and placed in neat, orderly piles. All passageways shall be kept clear of dry vegetation, greasy substance and debris.

Copies of the Safety Data Sheets should be available on file. Safety Data Sheets to be developed in accordance with SANS 10234. Additionally, the appropriate SANS standard must be adhered to.

### 8.2.4 Spillages prevention

In order to prevent risk of spillages, the following should be considered:

- Storage and transport of diesel fuel oil/chemicals should be done according to the Safety Data Sheets.
- Hydrocarbon spillage containment and clean-up kits should be available on-site at all times.
- The loading/unloading equipment, storage containers/tanks, and/or the associated delivery infrastructure should be inspected regularly by qualified personnel to ensure they are in good working conditions.
- Drip trays must be utilised during daily greasing and re-fuelling of machinery and to catch incidental spills and pollutants. They should be placed underneath the stationary vehicles on areas with possible leakages.
- Drip trays must be inspected on a weekly basis for leaks and effectiveness and emptied when necessary. This is to be closely monitored during rain events to prevent overflow.
- No refuelling or servicing should be undertaken without absorbent material or drip pans properly placed to contain spilled fuels.
- All construction vehicles will be properly maintained to prevent leaks.
- Cement mixing must be confined to a designated area and must be done on an impervious surface.
- Chemical toilets used during construction must be regularly cleaned.
    - In hydrocarbon materials or any other chemical waste storage areas, the following should be undertaken:
    - Any chemicals and materials stored on site should be clearly labelled and copies of the Safety Data Sheets should be available on file. Safety Data Sheets to be developed in accordance with SANS 10234.
    - All chemicals and materials should be stored in suitable storage containers and in well-ventilated storage areas according to their characteristics, e.g., flammability, corrosivity, etc.;
    - Incompatible chemicals should be stored separately; and
    - The appropriate SANS standard must be adhered to.
- Spill control equipment should be located wherever significant quantities of hazardous materials are received or stored.

- The Contractor should label any container with hazardous materials. They should ensure compliance with relevant labelling requirements for any container (including tanks) used on-site to store accumulated hazardous wastes.
- Hazardous wastes will be collected regularly and disposed of in accordance with all applicable laws by a registered service provider.

This would therefore require a suitable induction course. Note: only the employees with training in spill response should attempt to contain or clean up a spill.

### 8.2.5 Injury on site

All personnel (including contractors) and visitors shall wear appropriate personal protective equipment (PPE) and clothing according to the expected risks or exposure associated with the area visited and the activities carried out.

All personnel (including contractors) should be made aware of the risks and the preventative measures to limit the likelihood of an emergency taking place.

This would therefore require a suitable induction course.

### 8.2.6 Crime

Sufficient security personnel should be stationed at all times at the main entrances/exits at the Phula PV site. All personnel and contractors should be required to visibly wear identification badges at all times.

### 8.2.7 Emergency assembly point

Suitable emergency assembly point(s) shall be identified, and the area should be clearly marked. All site personnel and visitors should be made aware of its location(s).

## 8.3 Training

Training aims to create an understanding of the Emergency Preparedness Response Plan and the responsibilities of the relevant personnel, as well as educate site employees on the procedures to be followed during an emergency.

All employees and contractors will be trained in emergency response procedures. The Health and Safety Manager shall distribute the Emergency Preparedness Response Plan to all parties in charge of ensuring the plans implementation. All relevant information in the Emergency Preparedness Response Plan shall be communicated to all employees and contractors. This information shall include information on potential emergency risks/threats, appropriate first-person response to incidents/emergencies and notification procedures.

All site personnel, including contractors, are to be trained in the appropriate responses for emergencies. The training is mandatory and is to be conducted on a regular basis.

## 8.4 Management of emergency procedures

The overall objective of managing emergency incidents lie in minimising environmental impacts associated with emergency procedures; and provide a safe and healthy working environment to construction workers and the public.

### 8.4.1 Emergency contact information

A list of emergency contact numbers shall be readily available and clearly visible at various points at the facility. This shall include (but not limited) to the following:

- Paramedic;
- Phula PV site safety officer on duty;
- Phula PV site manager;
- Phula PV site Emergency Services Coordinator;
- Security;
- South African Police Service;
- Fire Department (from the Municipality);
- Ambulance/Emergency Response;
- Provincial Department of Water and Sanitation; and
- DFFE

### 8.4.2 Inventory and maintenance of emergency equipment

Emergency equipment shall be maintained and checked regularly to ensure that it is in a working condition according to the maintenance schedule. Essential equipment such as first aid kits, flashlights and batteries, fire extinguishers and portable spill kits shall be accessible at all times.

Ensure that the designated person(s) knows how the equipment should be operated. A list of all emergency equipment shall be kept and maintained in good order by the subordinate manager in each area.

### 8.4.3 Safe working procedures

Safe working procedures (or SWP's) should be developed for circumstances where work will be done under hazardous conditions. These should be updated if a procedural, equipment or hazard change occurs.

## 8.5 Response

The actions to be executed immediately upon occurrence, during, and after an emergency/disaster are outlined in this section.

### 8.5.1 Vehicle accident

The first person at the scene must assess the situation and report the accident information to his/her supervisor. This person should furthermore:

- Administer first aid as may be required. Do not move seriously injured person(s);
- Show the Paramedic and other emergency personnel to the injured person(s) upon their arrival;
- Address any spills according to a Waste/Chemical spill procedure.

### 8.5.2 Fire

The first person at the scene must assess the situation and report the following information to his/her supervisor:

- State that there is a fire and provide details on the location thereof;
- Type and size of the fire (dust, building, grass, electrical, chemical, equipment etc.);
- Direction of the fire;
- Property / equipment that can be damaged by the fire;
- Whether or not there is electricity involved and if it has been switched off;

Burning of waste is not permitted. The contractor shall comply with the National Veld and Forest Fire Act (No. 101 of 1998).

### 8.5.3 Waste or Chemical Spill

The procedures vary depending on the extent of the spill. Once the spill occurs, the employee will need to evaluate the waste/chemical spill in order to determine whether or not it is a major or minor spill.

#### *8.5.3.1* Response procedure

The first person on the scene at a spill site shall:

- Immediately notify appropriately trained personnel;
- Isolate and stop the spill if possible and begin clean-up (if it is safe);
- Report the spill to a supervisor and/or inspector(s); and
- Initiate evacuation of the area if necessary.

The site personnel will only attempt to clean up or control a spill if they have received proper training and possess the appropriate protective clothing and clean-up materials. Untrained individuals will notify the appropriate response personnel and may only attempt to isolate the spill, if safe.

**In case of a minor spill:**

- Wear appropriate Personal Protective Equipment, if required;
- Inform other personnel of the incident;
- Stay up-wind;
- Confine the spill as much as possible using sand, sawdust or other suitable absorbent material;
- Use an appropriate, portable spill kit to clean up;
- If necessary, vacate the immediate area;
- Collect waste and treat or dispose of at appropriate facility.

**In case of a major spill:**

- Wear appropriate PPE as required;
- Inform other personnel of the incident;
- Stay up-wind;

- Avoid contact with material and evacuate people in immediate area, if necessary;
- Security to demarcate the area with barrier tape (barrier net) where the substance was spilled (ensure that the person demarcating the area performs this task upwind of the spill to prevent contact with vapours);
- Report to the ECO who will contact a qualified Environmental Emergency Response Team and who will be contracted to clean the area, ensure the area is isolated and prevent further pollution. Report the following:
  - Type of incident that took place (e.g., spill);
  - Location of the incident (state clearly whether it occurred near a watercourse and if so, state the watercourse which will be affected);
  - Severity of the incident;
  - Possible environmental impact of the incident;
  - Personnel and property/equipment in danger;
  - Substance spilled (identify the substance via the packaging label or Safety Data Sheet);
  - Quantity of substance spilled;
  - Size of the spill and equipment required for cleaning or containing the spill;
  - Prevailing wind direction;
  - Determine the substance's hazard to humans and the correct disposal methods from to the Safety Data Sheet.
- The Health, Safety and Environmental (HS&E) Manager shall designate a person from to take photos. Sampling equipment should be taken on site to analyse the effect of pollution on the environment.
- The Health, Safety and Environmental Manager, after consultation with the AGV Manager, shall communicate incident information to relevant organisations.
- Report the incident to the DHSWS and DFFE in the case that water pollution and or environmental damage has been caused.
- Report the incident to the Police Services in the case that large scale evacuation or regional warnings need to be given.

### 8.5.4 Evacuation

A site plan must be on site at all times and be visible to all personnel. The plan shall display the areas of responsibility of the contingency officers, as well as all emergency exits. Site plan of the construction site and camps including all buildings, boundaries and outside features must indicate the positions of the following:

- Emergency exits;
- Assembly points;
- Locations of fire extinguishers;
- Fire alarm pull stations' location;
- Roads; and
- Site layout plan.

### 8.5.5 Medical emergency

All workers will be supplied with the required PPE as per the Occupational Health and Safety Act (Act No. 85 of 1993).

All personal injuries, no matter how minor, that occur on the Phula PV site must be reported to the Paramedic. All documentation regarding the injury should be forwarded to the HS&E manager for record purposes.

## 8.6 Recovery

### 8.6.1 Assessment of extent of damage

A suitably qualified person shall assess the damage after the emergency to determine the extent of damage and propose corrective actions to remediate damages and impacts.

### 8.6.2 Remediation

Any remediation measures that are implemented shall be conducted under the supervision of a suitably qualified person. Remediation shall include measure to prevent the incident from recurring (where possible).

### 8.6.3 Incident communication / reporting

Only the ECO, after consultation with the Phula PV Project Manager, shall communicate incident information to government bodies, downstream users and/or affected parties if necessary.

Major spill shall be reported to the ECO within 48 hours of the incident.

Any incident or accident in which a substance pollutes or has the potential to pollute a water resource or have a detrimental effect on a water resource, shall be reported to the DWS.

Any major incident such as spillage, fire, emissions, which may lead to danger to the public or environment shall be reported to:

- Department of Forestry, Fisheries and the Environment
- SAPS and Fire Protection Service;
- Provincial Department or municipality; and
- All persons whose health may be affected.

The report shall include:

- Nature of incident; date of incident report, immediate actions taken;
- Substances involved, estimation of the quantities released and their possible acute effect on persons and the environment and data needed to assess the effects;
- Initial measures to minimize impacts;
- Cause of incident whether direct or indirect, including equipment, technology, system or management failure; and
- Avoidance measures taken or to be taken.

Within 14 days, a further report shall be submitted to the DFFE, provincial departments (head of department) and municipality to enable an initial evaluation of the incident.

### 8.7 Record keeping

The HS&E manager shall keep the following records for a period of two (2) years:

- Emergency Response Drills (including copies of drills conducted by contractors) if undertaken;
- Incident reports regarding details of emergency situations;
- Action plans developed for the rectification of issues arising from emergency drills; and
- Any reports submitted to the DFFE as per the legal requirements.

Copies of the above must be submitted to the Paramedic/HS&E manager.

## 9. ENVIRONMENTAL AWARENESS PLAN

It is important to ensure that the Contractor has the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and ongoing minimisation of environmental harm. It is vital that all personnel are adequately trained to perform their designated tasks to an acceptable standard.

The Contractor shall ensure that its employees and sub-Contractors who carry out all or part of the Contractor's obligations are adequately trained with regard to the implementation of the EMPr, as well as environmental legal requirements and obligations. Training shall be conducted by the Contractor HS&E as and when required, as determined by the ECO.

## 10. CHANCE FIND PROCEDURE

Heritage resources are protected in terms of the National Heritage Resources Act, Act 25 of 1999 (NHRA). If any of the applicant' employees find any heritage resources during any developmental activity, the following chance find procedure must be implemented:

- An appropriately qualified heritage practitioner / archaeologist must be identified to be called upon in the event that any possible heritage resources or artefacts are identified;
- Should an archaeological site or cultural material be discovered during construction (or operation), the area should be demarcated, and construction activities halted;
- The qualified heritage practitioner / archaeologist will then need to come out to the site and evaluate the extent and importance of the heritage resources and make the necessary recommendations for mitigating the find and the impact on the heritage resource;
- The contractor therefore should have some sort of contingency plan so that operations could move elsewhere temporarily while the materials and data are recovered and
- Construction can commence as soon as the site has been cleared and signed off by the heritage practitioner / archaeologist.

## 11. SITE DOCUMENTATION /MONITORING /REPORTING

The Applicant/Authorisation Holder's site documentation shall be used to keep records on site and all non-compliances to the EMPr, EA and the WUL will be reported within 48 hours. All documents shall be kept on site and be available for monitoring and auditing purposes. An Environmental Audit Team may require access to this documentation for auditing purposes when site visits are conducted. The documentation shall be signed by all parties to ensure that such documents are legitimate.

Regular monitoring of all site works by the SM, ECO and CM is imperative to ensure that any problems encountered are solved punctually and amicably. When the SM is unavailable, the PM / ECO shall keep up-to-date on all works to ensure no problems arise. The following checklist may be used as an environmental performance monitoring tool.

**Table 11-1: Environmental performance monitoring checklist**

| Person responsible for this construction is: | | |
|---|---|---|
| Name: | | |
| Designation: | | |
| Reporting of environmental performance, problems and priorities are as follows: | | |
| | | |
| | | |
| | | |
| Environmental monitoring of the construction is according to the following schedule: | | |
| | | |
| | | |
| The following negative environmental impacts have been identified at the site: | | |
| Environmental Problem | | Location |
| | | |
| | | |
| | | |
| | | |
| In order to solve (mitigate) the above identified negative environmental impacts, the following plan of action is to be implemented: | | |
| Problem | Solution | Date to be completed |
| | | |
| | | |
| | | |
| | | |

| Person responsible for environmental monitoring (follow-up) is: | | |
|---|---|---|
| Name: | | |
| Designation: | | |
| Monitoring Date: | | |
| Monitoring (follow-up) plan of implemented remedial action: | | |
| Problem | Solution as implemented | Has the solution worked, if not, what actions are still to be taken |
| | | |
| | | |
| | | |
| | | |

## 11.1 Document control

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

### 11.1.1 Documentation to be available

The following documentation must be kept on site in order to record compliance with the EMPr:

- A full copy of the signed environmental authorisation;
- Copy of the EMPr;
- Copy of the Water Use Licence;
- Copy of all rehabilitation plans (designs), including stormwater management;
- A legal register of relevant legislation;
- Emergency Response Plan
- Environmental Policy of the Principal Contractor;
- Environmental register, which includes:
  - Communications Register including records of complaints, and, minutes and attendance registers of all environmental meetings and environmental related toolbox talks.
  - Monitoring Results – including environmental monitoring reports, register of audits, etc.

- Incident book – including copies of notification of Emergencies and Incidents, this must be accompanied by a photographic record.

## 11.2 Compliance monitoring and audit

An environmental audit forms part of the monitoring methods relating to the mitigation and management and must be undertaken by a qualified and independent ECO. Undertaken inspections must be compiled in a report format.

Environmental audits will be undertaken by the ECO and are a legal requirement in terms of NEMA once an EA is issued and as long as the EMPr is valid. The findings and outcomes of these audits will be recorded in the EMPr file. The environmental audits and associated reports must be conducted and submitted to the CA at intervals as indicated in the EA.

The ECO shall prepare a monthly Environmental Audit Report. At a frequency determined by the EA, the PM shall submit the monthly reports to the CA in terms of the 2014 EIA Regulations, section 34. At a minimum the Monthly report is to cover the following:

- Weekly Environmental Checklists;
- Deviations and non-compliances with the checklists;
- Non-compliances issued;
- Completed and reported corrective actions;
- Environmental Monitoring;
- General environmental findings and actions.

### 11.2.1 Corrective action records

For each significant non-compliance, a documented corrective action must be recorded. On receiving a non-compliance notice from the ECO, the contractor / 65anagers will ensure that the corrective actions required take place within the stipulated timeframe. On completion of the corrective action the contractor is to issue a Corrective Action Report in writing to the ECO. If satisfied that the corrective action has been completed appropriately, the ECO is to sign-off on the Corrective Action Report and attach the report to the non-compliance notice in the EMPr file. A corrective action is considered complete once the report signed off by the ECO.

### 11.2.2 Photographic record

A digital photographic record will be kept. The photographic record will be used to show before, during and post rehabilitation evidence of the project as well used in cases of damages claims if they arise. Each image must be dated, and a brief description note attached.

The Contractor shall:

- Allow the ECO access to take photographs of all areas, activities and actions.

The ECO shall keep an electronic database of photographic records which will include:

- Pictures of all areas designated as work areas, camp areas, construction sites and storage areas taken before these areas are set up;
- All bunding and fencing;
- Road conditions and road verges;

- Condition of all farm fences;
- Topsoil storage areas;
- All areas to be cordoned off during construction;
- Waste management sites;
- Ablution facilities;
- Any non-conformances deemed to be “significant”;
- All completed corrective actions for non-compliances;
- All required signage; and
- All areas before, during and post rehabilitation.

Relevant photographs will be included in the Final Environmental Audit Report.

## 11.3 Specific Monitoring Programmes

Monitoring is essential to prevent and mitigate any potential impacts on the receiving environment at the proposed site and to warrant that environmental management measures are enforced. It is suggested that the below monitoring be undertaken for three (3) years post-closure and thereafter be re-evaluated. The following on-going monitoring programme should be undertaken for the Phula PV facility.

### 11.3.1 Aquatic monitoring programme

It is crucial that a monitoring programme is implemented by the applicant with the aim in conserving and protecting the aquatic environment to the desired ecological state. A comprehensive database on the aquatic ecosystem will provide more accurate data over a timeframe in order to provide more accurate and site specific recommendations and mitigation measures that requires implementation. Table 11-2 provides an overview of a typical monitoring programme associated with a Phula PV Facility.

**Table 11-2: Recommended Aquatic Monitoring Programme**

| PROJECT PHASE | MONITORING REQUIREMENTS | SITES TO BE MONITORED | MONITORING FREQUENCY |
|---|---|---|---|
| Pre-Construction phase | • Bio-monitoring<br>• Surface Water Monitoring | • Springkaanspruit<br>• Dwars River<br>• Unnamed Tributaries | • Bi-annual Bio-monitoring<br>• Quarterly Surface Water monitoring |
| During Construction phase | • Bio-monitoring<br>• Surface Water Monitoring | • Springkaanspruit<br>• Dwars River<br>• Unnamed Tributaries | • Bi-annual Bio-monitoring<br>• Monthly Surface Water monitoring |
| Post Construction phase | • Bio-monitoring<br>• Surface Water Monitoring | • Springkaanspruit<br>• Dwars River<br>• Unnamed Tributaries | • Bi-annual Bio-monitoring<br>• Quarterly Surface Water monitoring |

Bio-monitoring must be conducted once during the wet summer period and once during the dry winter period in order to mitigate any seasonable variability effects. It is recommended that surface water assessments be included within the bio-monitoring programme as it is generally closely interlinked to any sudden changes in bio-monitoring

data. Surface water results will also be beneficial in identifying any site specific surface water run-off impacts related to the solar panels as well as the construction phase.

### 11.3.2 Social management and monitoring plan

**Table 11-3** details the measures to be undertaken to mitigate the negative impacts while enhancing the positive impacts associated with Phula PV project.

**Table 11-3: Social Management and Monitoring Plan**

| SOCIAL MANAGEMENT AND MONITORING PLAN | | | |
|---|---|---|---|
| OBJECTIVE 1: | MAXIMISE LOCAL EMPLOYMENT OPPORTUNITIES AND LOCAL PROCUREMENT DURING CONSTRUCTION AND OPERATION AND MINIMISE JOB LOSSES DURING DECOMMISSIONING AND CLOSURE; IMPACT ON POVERTY | | |
| Mitigation: Action/control | | Responsibility | Timeframe |
| Encourage any possible new local labour in the recruitment process as part of the company's own recruitment policy or as part of the contractor management plan, if allowable, and encourage the procurement of new employees, especially in the unskilled category, from the local communities. | | Contractor | Construction |
| Procurement is encouraged within the municipal areas and district if such materials, services and equipment are available and suitable for the proposed development. | | Contractor | Construction and Operation |
| Make use of any existing databases of available workers and include the legal local representatives, local municipalities and other legally established community structures in the process. | | Contractor | Construction |
| Maximise the employment of locals where the required skills are available. | | Contractor | Construction and Operation |
| If possible, a percentage of the workforce at the PV construction should be considered for women and the disabled. | | Contractor | Construction |
| Involvement of entrepreneurs, small businesses, and SMME's during the construction process of the PV facility is encouraged where possible | | Contractor | Construction |
| Tender documentation should contain guidelines for the involvement of labour, entrepreneurs, businesses and SMME's from the local sector. | | Contractor | Construction and Operation |
| Communication efforts concerning job creation opportunities at the PV facility should refrain from creating unrealistic expectations and it should be clearly communicated. | | Contractor | Construction |
| Skills development and on-site training would be imperative to enhance capacity building and equipping employees with transferable skills. Continue to provide skills development and capacity building opportunities for employees as part of the operational phase. | | Contractor | Operations |
| Develop a database of goods and services that could potentially be outsourced to the local community as part of the PV facility operation | | Contractor | Operations |
| Establish supply links with localised suppliers, where feasible. | | Contractor | Operations |
| Replace technology and infrastructure with newer technology and infrastructure to extend the life of the facility, if feasible. | | Contractor | Operations and Decommissioning |

| SOCIAL MANAGEMENT AND MONITORING PLAN | | |
|---|---|---|
| The project proponents must develop mechanisms to assist employees, prior to the retrenchment date, and in the transition phase after closure of the facility. This can include offering portable skills development programmes during the operational phase, and by providing assistance in accessing available and suitable jobs. | Contractor | Operations and Decommissioning |
| Focus on non-core related local supply links during the operational phase to facilitate easier transitioning of local suppliers to other industries. | Contractor | Operations and Decommissioning |
| Monitoring | Annually as per the agreed commitments and procurement strategies<br>Complaints Register | |

| OBJECTIVE 2: | MINIMISE ANY POTENTIAL NEGATIVE IMPACTS ASSOCIATED WITH THE INFLOW OF WORKERS AND JOBSEEKERS | |
|---|---|---|
| Mitigation: Action/control | Responsibility | Timeframe |
| Communication efforts concerning job creation opportunities at the PV facility should refrain from creating unrealistic expectations. Job opportunities must be clearly communicated | Contractor | Construction |
| The workers are expected to be transported to site on a daily basis. | Contractor | Construction |
| Employment of unskilled individuals, that will form the bulk of the construction workforce, from the local communities will limit the need for additional temporary accommodation | Contractor | Construction |
| Incorporate the additional need for housing as part of the municipality's overall planning strategy. | Contractor | Operations |
| Maximise the employment of locals where the required skills are available. | Contractor | Construction and Operations |
| Monitoring | Annually as per the agreed commitments and procurement strategies<br>Environmental Incident Log<br>Complaints Register | |

| OBJECTIVE 3: | ENHANCE LOCAL AND REGIONAL ECONOMIC BENEFITS | |
|---|---|---|
| Mitigation: Action/control | Responsibility | Timeframe |
| Direct and indirect spin-offs from employment to be enhanced through local procurement. | Contractor | Construction and Operation |
| Procurement should be focused within the municipal areas and district if such materials, services and equipment are available | Contractor | Construction and Operation |
| The contractor should create conditions that are conducive for the involvement of entrepreneurs, small businesses, and SMME's during the construction process of the PV facility | Contractor | Construction |
| Project proponent to commit to enterprise and socio-economic development by committing a percentage of their revenue to these types of developments. | Authorisation Holder | Operation |
| Socio-economic development programmes to be based on a collaborative and inclusive approach. | Contractor and Authorisation Holder | Operation |
| Develop a local procurement plan. | Contractor | Operation |
| Environmental management of the project site must adhere to environmental regulations. | Contractor and Authorisation Holder | Operation |
| Monitoring | Annually as per the agreed commitments and procurement strategies | |

| SOCIAL MANAGEMENT AND MONITORING PLAN |
|---|

| OBJECTIVE 4: | MINIMISE RISKS TO COMMUNITY SAFETY | | |
|---|---|---|---|
| Mitigation: Action/control | | Responsibility | Timeframe |
| Fencing of the property, lighting, cameras, and 24-hour security to be installed and implemented to improve security at and around the site. | | Contractor and Authorisation Holder | Construction and Operation |
| No accommodation facility / construction camp to be erected on site. Temporary workers to be transported to and from the site on a daily basis | | Contractor | Construction and Operation |
| Temporary traffic calming measures to be implemented at construction site entrance. Mitigation measures of the Traffic Impact Assessment to be implemented. | | Contractor | Construction |
| Develop and implement a Health and Safety Plan according to SHEQ best practices for the construction phase. Limit safety risks through design considerations, location of infrastructure and precautionary construction management principles | | Contractor | Construction |
| Develop an Emergency Response Action Plan | | Contractor | Construction and Operation |
| Environmental management of the project site must adhere to environmental regulations | | Contractor | Construction and Operation |
| Develop and implement a Health and Safety Plan according to SHEQ best practices for the operational phase. | | Contractor | Operation |
| Limit safety risks through implementing safety and security measures. | | Contractor | Construction |
| Develop a Fire Management Strategy and Plan | | Contractor | Construction and Operation |
| Safety controls and measures must be put in place to avoid unauthorised entry to the site. | | Contractor | All phases |
| Develop and implement a Health and Safety Plan according to SHEQ best practices for the decommissioning phase. | | Contractor | Decommissioning |
| Monitoring | Annual environmental performance audits<br>Annual SHEQ performance audits<br>Environmental Incident Log<br>Complaints Register | | |

### 11.3.3 Groundwater monitoring programme

The recommended groundwater monitoring programme (Milnex CC, 2023) indicates that the groundwater monitoring network design should comply with the risk-based source-pathway-receptor principle.

The proposed monitoring network is presented below. Two boreholes are recommended to be monitored.

**Table 11-4: Proposed Monitoring Network**

| Name | Co-ordinates (WGS, 84) | | Status |
|---|---|---|---|
| | Latitude | Longitude | |
| BH2 | -24.940696 | 30.13506 | Proposed production borehole. |
| BH5 | -24.941768 | 30.146607 | Proposed monitoring borehole |

**Table 11-5: Groundwater monitoring programme**

| Monitoring position | Sampling interval | Water Quality Standards |
|---|---|---|
| All monitoring boreholes | Quarterly: measuring the depth of groundwater levels | N/a |
| All monitoring boreholes | Annually: sampling for water quality analysis | • SANS241:2015 Drinking Water Standards<br>• Water Use License/EMP requirements (if applicable) |

# 12. PERFORMANCE ASSESSMENT

In compliance with the legislative requirements Authorisation Holder must conduct monitoring on a continuous basis and conduct EMPr performance audits for the purpose of determining compliance to the commitments made in this application. Performance assessment reports must be submitted to the DFFE to demonstrate that performance assessments of the EMPr are being conducted.

## 12.1 Period

The EMPr performance assessment will be conducted annually by a suitably qualified person with an independent review of the performance assessment every two years. This independent review will be performed by an external, independent third party.

## 12.2 Scope of assessment

The main objective of a performance assessment is to determine whether or not the Phula PV project has complied with its environmental policies and objectives. Therefore, the scope of the performance assessment for the proposed project will include:

- An assessment of the conformance to the environmental policy;
- An assessment of the extent of compliance with the EMPr and legislation;
- A review of the results of previous audits (if available); and
- The identification of areas of potential improvement for the EMPr.

The areas to be audited are those that have been affected by the project, as well as those that have not yet been affected, but still require management. As part of the performance assessment, a risk assessment will be undertaken to assist management in compliance with legislation, financial planning, site-specific decision making, prioritisation and evaluation of risk reduction measures, and to assist in undertaking precautionary or remedial actions.

The performance assessment will include the following:

- Information regarding the period applicable to the performance assessment;
- The scope of the assessment;
- The procedure used for the assessment;
- The interpreted information gained from monitoring the approved EMPr;
- The evaluation criteria used during the assessment;
- The results of the assessment; and
- Recommendations for rectification.

### 12.3 Interpreted information

Where raw data and information is not meaningful for auditing purposes, the data will be interpreted by a suitably qualified specialist, e.g., surface water and groundwater quality, dust monitoring. Once the information has been interpreted and a problem has been identified, measures will be recommended to remediate the existing problem, or to prevent the identified potential problem from reoccurring.

### 12.4 Evaluation criteria used

The criteria used for performance assessments will be conducted taking the following aspects into consideration:

- The legislative requirements;
- Applicable policies and procedures (guidelines) of relevant regulatory authorities applicable to the various environmental components; and
- The aspects identified (and management measures stipulated) in the EMPr.

### 12.5 Results of assessment

The EMPr performance assessment will result in the provision of documentation concerning EMPr performance assessment findings (in tabular format) that will include:

- Method and procedure statement;
- Qualifications and experience of audit team;
- Percentage compliance with EMPr measures;
- Motivation of findings;
- Recommendations pertaining to major non-compliances noted.

### 12.6 Recommendations / rectifications

Recommendations and rectifications will be made depending on the findings of the performance assessment. The EMPr for the Phula PV project should be revised to accommodate improvements, and a follow-up audit should be performed to determine whether the recommendations of the original performance assessment have been implemented.

## 13. EMPR REVISION

The EMPr should be updated to include additional site-specific information and specifications as the project progresses and when required. Any amendments to the EMPr must be approved by the designated authorising authority prior to implementation.

Amendments to the EMPr must be in accordance with Regulations 35 to 37 of the EIA Regulations, 2014 (as amended) [GN No. R.326 of 2017] or any relevant legislation that may be applicable at the time.

## 14. NON-CONFORMANCE PENALTY

The ECO must monitor compliance with this EMPr and conditions of the EA, and report the results in monthly ECO Reports. For the identified non-conformances, the source must be determined, and corrective actions must be identified and implemented.

The ECO to take up any non-compliance issues that may result in a fine/penalty with the PM. The PMs decision with regard to what is considered a violation, its seriousness and the penalty imposed shall be final.

Penalties/fines must be issued at the discretion of the PM as per the penalty's agreement between the PM and Contractor.

## 15. CONCLUSION

The successful implementation of this EMPr and its management actions will ensure that compliance with the environmental legislative requirements are achieved and that the likelihood of impacts occurring is reduced sufficiently. The success of this EMPr and overall sustainability of the project will further increase as a result of the defined organisational and administrative arrangements for environmental management and monitoring of the proposed project as well as procedures for environmental control, in the event of pollution (spillage) or similar events requiring action.

**Luceth Khumbuzi (Reg EAP, EAPASA)**

**Jana Minnaar (de Jager) (Reg EAP, EAPASA; PriSciNat)**

**Jacqui Hex (Reg EAP, EAPASA; PriSciNat)**
for Jones & Wagener

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# APPENDIX A

## GENERIC EMPR FOR ONSITE SUBSTATION

**K2022578590 (SOUTH AFRICA) PTY LTD**

# PROPOSED UP TO 130MW PHULA PV FACILITY, NEAR STEELPOORT IN THE LIMPOPO PROVINCE PROJECT GENERIC ENVIRONMENTAL MANAGEMENT PROGRAMME FOR SUBSTATION INFRASTRUCTURE
## DRAFT GENERIC EMPR

**DFFE REF: 14/12/16/3/3/2/2350**

J&W Report No.: JW347/23/K135-10-Rev0

October 2023

Jones & Wagener
Engineering & Environmental Consultants

Internet presence: www.jaws.co.za

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

environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

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# INTRODUCTION

## 1. Background

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

## 2. Purpose

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

## 3. Objective

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

## 4. Scope

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

## 5. Structure of this document

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

| Part | Section | Heading | Content |
|---|---|---|---|
| A | | Provides general guidance and information and is **not legally binding** | Definitions, acronyms, roles & responsibilities and documentation and reporting. |
| B | 1 | Pre-approved generic EMPr template | Contains generally accepted impact management outcomes and impact management actions required for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of substation infrastructure for the transmission and distribution of electricity, which are presented in the form of a template that has been pre-approved.<br><br>The template in this section is to be completed by the contractor, with each completed page signed and dated by the holder of the EA prior to commencement of the activity.<br><br>Where an impact management outcome is not relevant, the words "not applicable" can be inserted in the template under the "responsible persons" column.<br><br>Once completed and signed, the template represents the EMPr for the activity approved by the CA and is legally binding. The template **is not required** to be submitted to the CA as once the generic EMPr is gazetted for implementation, it has been approved by the CA.<br><br>To allow interested and affected parties access to the pre-approved EMPr template for consideration through the decision-making process, the EAP on behalf of the applicant/proponent must make the hard copy of this EMPr available at a public location and where the applicant has a website, the EMPr should also be made available on such publicly accessible website. |
| | 2 | Site specific information | Contains preliminary infrastructure layout and a declaration that the applicant/holder of the EA |

| Part | Section | Heading | Content |
|---|---|---|---|
| | | | will comply with the pre-approved generic EMPr template contained in Part B: Section 1 and understands that the impact management outcomes and impact management actions are **legally binding**. The preliminary infrastructure layout must be finalized to inform the final EMPr that is to be submitted with the basic assessment report (BAR) or environmental impact assessment report (EIAR), ensuring that all impact management outcomes and impact management actions have been either pre-approved or approved in terms of Part C.<br>This section **must be** submitted to the CA together with the final BAR or EIAR. The information submitted to the CA will be considered to be incomplete should a signed copy of Part B: section 2 not be submitted. Once approved, this Section forms part of the EMPr for the development and is legally binding. |
| C | | Site specific sensitivities/attributes | If any specific environmental sensitivities/attributes are present on the site which require site specific impact management outcomes and impact management actions, not included in the pre-approved generic EMPr, to manage impacts, these specific impact management outcomes and impact management actions must be included in this section. These specific environmental attributes must be referenced spatially, and impact management outcomes and impact management actions must be provided. These specific impact management outcomes and impact management actions must be presented in the format of the pre-approved EMPr template (Part B: section 1)<br><br>This section will not be required should the site contain no specific environmental sensitivities or attributes. However, if Part C is applicable to the site, it **is required** to be submitted together with the BAR or EIAR, for consideration of, and decision on the application for EA. The |

| Part | Section | Heading | Content |
|---|---|---|---|
| | | | information in this section must be prepared by an EAP and must contain his/her name and expertise including a curriculum vitae. Once approved, Part C forms part of the EMPr for the site and is legally binding.<br><br>This section applies only **to additional** impact management outcomes and impact management actions that are necessary for the avoidance, management and mitigation of impacts and risks associated with the specific development or expansion and which are not already included in Part B: section 1. |
| Appendix 1 | | | Contains the method statements to be prepared prior to commencement of the activity. The method statements are **not required** to be submitted to the competent authority. |

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

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

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

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

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

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

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

contemplated in Regulation 36 of the EIA Regulations.

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

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

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

Sub-section 2 is to be prepared by an EAP and must contain his/her name and expertise including a curriculum vitae. This sub-section must include a map of the site sensitivity overlaid with the preliminary infrastructure layout using the national web based environmental screening tool, when available for compulsory use at: https://screening.environment.gov.za/screeningtool. The sensitivity map shall identify the nature of each sensitive feature e.g., threatened plant species, archaeological site, etc. Sensitivity maps shall identify features both within the planned working area and any known sensitive features and within 50 m from the development footprint.

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

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

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

## PART A – GENERAL INFORMATION

### 1. DEFINITIONS

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

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

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

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

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

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

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

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

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

**"solid waste"** means all solid waste, including construction debris, hazardous waste, excess

cement/ concrete, wrapping materials, timber, cans, drums, wire, nails, food and domestic waste (e.g., plastic packets and wrappers);

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

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

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

## 2. ACRONYMS and ABBREVIATIONS

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

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

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

**Table 3-1: Guide to roles and responsibilities for implementation of an EMPr**

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

| Responsible Person(s) | Role and Responsibilities |
|---|---|
| Developer Site Supervisor (DSS) | Role<br>The DSS reports directly to the DPM, oversees site works, liaises with the contractor(s) and the ECO. The DSS is responsible for the day to day implementation of the EMPr and for ensuring the compliance of all contractors with the conditions and requirements stipulated in the EMPr.<br><br>Responsibilities<br>- Ensure that all contractors identify a contractor's Environmental Officer (cEO);<br>- Must be fully conversant with the conditions of the EA. Oversees site works, liaison with Contractor, DPM and ECO;<br>- Must ensure that all landowners have the relevant contact details of the site staff, ECO and cEO;<br>- Issuing of site instructions to the Contractor for corrective actions required;<br>- Will issue all non-compliances to contractors; and<br>- Ratify the Monthly Environmental Report. |
| Environmental Control Officer (ECO) | Role<br>The ECO should have appropriate training and experience in the implementation of environmental management specifications. The primary role of the ECO is to act as an independent quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts. In this respect, the ECO is to conduct periodic site inspections, attend regular site meetings, pre-empt problems and suggest mitigation and be available to advise on incidental issues that arise. The ECO is also required to conduct compliance audits, verifying the monitoring reports submitted by the cEO. The ECO provides feedback to the DSS and Project Manager regarding all environmental matters. The Contractor, cEO and dEO are answerable to the Environmental Control Officer for non-compliance with the Performance Specifications as set out in the EA and EMPr.<br><br>The ECO provides feedback to the DSS and Project Manager, who in turn reports back to the Contractor and potential and Registered Interested &Affected Parties' (RI&AP's), as required. Issues of non-compliance raised by the ECO must be taken up by the Project Manager, and resolved with the Contractor as per the conditions of his contract. Decisions regarding environmental procedures, specifications and requirements which have a cost implication (i.e. those that are deemed to be a |

| Responsible Person(s) | Role and Responsibilities |
|---|---|
| | variation, not allowed for in the Performance Specification) must be endorsed by the Project Manager. The ECO must also, as specified by the EA, report to the relevant CA as and when required.<br><br><u>Responsibilities</u><br>The responsibilities of the ECO will include the following:<br>- Be aware of the findings and conclusions of all EA related to the development;<br>- Be familiar with the recommendations and mitigation measures of this EMPr;<br>- Be conversant with relevant environmental legislation, policies and procedures, and ensure compliance with them;<br>- Undertake regular and comprehensive site inspections / audits of the construction site according to the generic EMPr and applicable licenses in order to monitor compliance as required;<br>- Educate the construction team about the management measures contained in the EMPr and environmental licenses;<br>- Compilation and administration of an environmental monitoring plan to ensure that the environmental management measures are implemented and are effective;<br>- Monitoring the performance of the Contractors and ensuring compliance with the EMPr and associated Method Statements;<br>- In consultation with the Developer Site Supervisor order the removal of person(s) and/or equipment which are in contravention of the specifications of the EMPr and/or environmental licenses;<br>- Liaison between the DPM, Contractors, authorities and other lead stakeholders on all environmental concerns;<br>- Compile a regular environmental audit report highlighting any non-compliance issues as well as satisfactory or exceptional compliance with the EMPr;<br>- Validating the regular site inspection reports, which are to be prepared by the contractor Environmental Officer (cEO);<br>- Checking the cEO's record of environmental incidents (spills, impacts, legal transgressions etc.) as well as corrective and preventive actions taken;<br>- Checking the cEO's public complaints register in which all complaints are recorded, as well as action taken; |

| Responsible Person(s) | Role and Responsibilities |
|---|---|
| | - Assisting in the resolution of conflicts;<br>- Facilitate training for all personnel on the site – this may range from carrying out the training, to reviewing the training programmes of the Contractor;<br>- In case of non-compliances, the ECO must first communicate this to the Senior Site Supervisor, who has the power to ensure this matter is addressed. Should no action or insufficient action be taken, the ECO may report this matter to the authorities as non-compliance;<br>- Maintenance, update and review of the EMPr;<br>- Communication of all modifications to the EMPr to the relevant stakeholders. |
| developer Environmental Officer (dEO) | <u>Role</u><br>The dEOs will report to the Project Manager and are responsible for implementation of the EMPr, environmental monitoring and reporting, providing environmental input to the Project Manager and Contractor's Manager, liaising with contractors and the landowners as well as a range of environmental coordination responsibilities.<br><br><u>Responsibilities</u><br>- Be fully conversant with the EMPr;<br>- Be familiar with the recommendations and mitigation measures of this EMPr, and implement these measures;<br>- Ensure that all stipulations within the EMPr are communicated and adhered to by the Employees, Contractor(s) ;<br>- Confine the development site to the demarcated area;<br>- Conduct environmental internal audits with regards to EMPr and authorisation compliance (on cEO);<br>- Assist the contractors in addressing environmental challenges on site;<br>- Assist in incident management:<br>- Reporting environmental incidents to developer and ensuring that corrective action is taken, and lessons learnt shared;<br>- Assist the contractor in investigating environmental incidents and compile investigation reports;<br>- Follow-up on pre-warnings, defects, non-conformance reports; |

| Responsible Person(s) | Role and Responsibilities |
|---|---|
| | - Measure and communicate environmental performance to the Contractor;<br>- Conduct environmental awareness training on site together with ECO and cEO;<br>- Ensure that the necessary legal permits and / or licenses are in place and up to date;<br>- Acting as Developer's Environmental Representative on site and work together with the ECO and contractor; |
| Contractor | Role<br>The Contractor appoints the cEO and has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract are in line with the EMPr and that Method Statements are implemented as described. External contractors must ensure compliance with this EMPr while performing the onsite activities as per their contract with the Project Developer. The contractors are required, where specified, to provide Method Statements setting out in detail how the impact management actions contained in the EMPr will be implemented during the development or expansion of substation infrastructure for the transmission and distribution of electricity activities.<br><br>Responsibilities<br>- project delivery and quality control for the development services as per appointment;<br>- employ a suitably qualified person to monitor and report to the Project Developer's appointed person on the daily activities on-site during the construction period;<br>- ensure that safe, environmentally acceptable working methods and practices are implemented and that equipment is properly operated and maintained, to facilitate proper access and enable any operation to be carried out safely;<br>- attend on site meeting(s) prior to the commencement of activities to confirm the procedure and designated activity zones;<br>- ensure that contractors' staff repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in EMPr, to the satisfaction of the ECO. |

| Responsible Person(s) | Role and Responsibilities |
|---|---|
| contractor Environmental Officer (cEO) | Role<br>Each Contractor affected by the EMPr should appoint a cEO, who is responsible for the on-site implementation of the EMPr (or relevant sections of the EMPr). The Contractor's representative can be the site agent; site engineer; a dedicated environmental officer; or an independent consultant. The Contractor must ensure that the Contractor's Representative is suitably qualified to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other site Contractors, labourers, the Environmental Control Officer and the public. As a minimum the cEO shall meet the following criteria:<br><br>Responsibilities<br>- Be on site throughout the duration of the project and be dedicated to the project;<br>- Ensure all their staff are aware of the environmental requirements, conditions and constraints with respect to all of their activities on site;<br>- Implementing the environmental conditions, guidelines and requirements as stipulated within the EA, EMPr and Method Statements;<br>- Attend the Environmental Site Meeting;<br>- Undertaking corrective actions where non-compliances are registered within the stipulated timeframes;<br>- Report back formally on the completion of corrective actions;<br>- Assist the ECO in maintaining all the site documentation;<br>- Prepare the site inspection reports and corrective action reports for submission to the ECO;<br>- Assist the ECO with the preparing of the monthly report; and<br>- Where more than one Contractor is undertaking work on site, each company appointed as a Contractor will appoint a cEO representing that company. |

## 4. ENVIRONMENTAL DOCUMENTATION REPORTING AND COMPLIANCE

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

### 4.1. Document control/Filing system

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

### 4.2. Documentation to be available

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

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

### 4.3. Weekly Environmental Checklist

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

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

### 4.4. Environmental site meetings

Minutes of the environmental site meetings shall be kept. The minutes must include an attendance register and will be attached to the Monthly Report that is distributed to attendees. Each set of minutes must clearly record "Matters for Attention" that will be reviewed at the next meeting.

### 4.5. Required Method Statements

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

The method statement must cover applicable details with regard to:

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

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

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

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

### 4.6. Environmental Incident Log (Diary)

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

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

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

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

The Environmental Incident Log will be captured in the Environmental Audit Report (EAR).

### 4.7. Non-compliance

A non-compliance notice will be issued to the responsible contractor by the ECOs via the DSS or Project Manager. The non-compliance notice will be issued in writing; a copy filed in the EMPr file and will at a minimum include the following:

- Time and date of the non-compliance;
- Name of the contractor responsible;
- Nature and description of the non-compliance;
- Recommended / required corrective action; and
- Date by which the corrective action to be completed.
- The contractors shall act immediately when a notice of non-compliance is received and correct whatever is the cause for the issuing of the notice.

Complaints received regarding activities on the development site pertaining to the environment shall be recorded in a dedicated register and the response noted with the date and action taken. The ECO should be made aware of any complaints. Any non-compliance with the agreed procedures of the EMPr is a transgression of the various statutes and laws that define the manner by which the environment is managed. Failure to redress the cause shall be reported to the relevant CA for them to deal with the transgression, as it deems fit. The contractor is deemed not to have complied with the EMPr if, inter alia, There is a deviation from the environmental conditions, impact management outcomes and impact management actions activities, as approved in generic and site specific EMPr as relevant as set out in the EMPr, which deviation has, or may cause, an environmental impact.

### 4.8. Corrective action records

For each non-compliance notice issued, a documented corrective action must be recorded. On receiving a non-compliance notice from the DSS, the contractor's cEO will ensure that the corrective actions required take place within the stipulated timeframe. On completion of the corrective action the cEO is to issue a Corrective Action Report in writing to the ECOs. If satisfied that the corrective action has been completed, the ECOs are to sign-off on the Corrective Action Report, and attach the report to the non-compliance notice in the EMPr file. A corrective action is considered complete once the report has signed off by the ECOs.

### 4.9. Photographic record

A digital photographic record will be kept. The photographic record will be used to show before, during and post rehabilitation evidence of the project as well used in cases of damages claims if they arise. Each image must be dated and a brief description note attached.

The Contractor shall:

- Allow the ECOs access to take photographs of all areas, activities and actions.

The ECOs shall keep an electronic database of photographic records which will include:

- Pictures of all areas designated as work areas, camp areas, development sites and storage areas taken before these areas are set up;
- All bunding and fencing;
- Road conditions and road verges;
- Condition of all farm fences;
- Topsoil storage areas;
- All areas to be cordoned off during construction;
- Waste management sites;
- Ablution facilities (inside and out);
- Any non-conformances deemed to be "significant";
- All completed corrective actions for non-compliances;
- All required signage;
- Photographic recordings of incidents;
- All areas before, during and post rehabilitation; and

- Include relevant photographs in the Final EAR.

### 4.10. Complaints register

The ECOs shall keep a current and up-to-date complaints register. The complaints register is to be a record of all complaints received from communities, stakeholders and individuals. The Complaints Record shall:

- Record the name and contact details of the complainant;
- Record the time and date of the complaint;
- Contain a detailed description of the complaint;
- Where relevant and appropriate, contain photographic evidence of the complaint or damage (ECOs to take relevant photographs); and
- Contain a copy of the ECOs written response to each complaint received and keep a record of any further correspondence with the complainant. The ECO's written response will include a description of any corrective action to be taken and must be signed by the Contractor, ECO and affected party. Where a damage claim is issued by the complainant, the ECOs shall respond as described in (**section 4.11**) below.

### 4.11. Claims for damages

In the event that a Claim for Damages is submitted by a community, landowner or individual, the ECOs shall:

- Record the full detail of the complaint as described in (**section 4.10**) above;
- The DPM will evaluate the claim and associated damage and submit the evaluation to the Senior Site Representative for approval;
- Following consideration by the DPM, the claim is to be resolved and settled immediately, or the reason for not accepting the claim communicated in writing to the claimant. Should the claimant not accept this, the ECO shall, in writing report the incident to the Developer's negotiator and legal department; and
- A formal record of the response by the ECOs to the claimant as well as the rectification of the method of making payments not amount will be recorded in the EMPr file.

### 4.12. Interactions with affected parties

Open, transparent and good relations with affected landowners, communities and regional staff are an essential aspect to the successful management and mitigation of environmental impacts.

The ECOs shall:

- Ensure that all queries, complaints and claims are dealt within an agreed timeframe;
- Ensure that any or all agreements are documented, signed by all parties and a record of the agreement kept in the EMPr file;
- Ensure that a complaints telephone numbers are made available to all landowners and affected parties; and
- Ensure that contact with affected parties is courteous at all times;

### 4.13. Environmental audits

Internal environmental audits of the activity and implementation of the EMPr must be undertaken. The findings and outcomes included in the EMPr file and submitted to the CA at intervals as indicated in the EA.

The ECOs must prepare a monthly EAR. The report will be tabled as the key point on the agenda of the Environmental Site Meeting. The Report is submitted for acceptance at the meeting and the final report will be circulated to the Project Manager and filed in the EMPr file. At a frequency determined by the EA, the ECOs shall submit the monthly reports to the CA. At a minimum the monthly report is to cover the following:

- Weekly Environmental Checklists;
- Deviations and non-compliances with the checklists;
- Non-compliances issued;
- Completed and reported corrective actions;
- Environmental Monitoring;
- General environmental findings and actions; and
- Minutes of the Bi-monthly Environmental Site Meetings.

### 4.14. Final environmental audits

On final completion of the rehabilitation and/or requirements of the EA a final EAR is to be prepared and submitted to the CA. The EAR must comply with Appendix 7 of the EIA Regulations.

**PART B: SECTION 1: Pre-approved generic EMPr template**

## 5. IMPACT MANAGEMENT OUTCOMES AND IMPACT MANAGEMENT ACTIONS

This section provides a pre-approved generic EMPr template with aspects that are common to the development of substation infrastructure for the transmission and distribution of electricity. There is a list of aspects identified for the development or expansion of substation infrastructure for the transmission and distribution of electricity, and for each aspect a set of prescribed impact management outcomes and associated impact management actions have been identified. Holders of EAs are responsible to ensure the implementation of these outcomes and actions for all projects as a minimum requirement, in order to mitigate the impact of such aspects identified for the development or expansion of substation infrastructure for the transmission and distribution of electricity.

The template provided below is to be completed by providing the information under each heading for each environmental impact management action.

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

### 5.1. Environmental awareness training

| **Impact management outcome:** All onsite staff are aware and understands the individual responsibilities in terms of this EMPr. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe of implementation | Responsible person | Frequency | Evidence of compliance |
| All staff must receive environmental awareness training prior to commencement of the activities; | ECO / dEO / cEO | Present environmental awareness training sessions | Construction | ECO | Monthly | Attendance register |
| The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course; | Contractor and ECO | Sufficient sessions should be scheduled through consultation between the Contractor and ECO. | | | | |
| Refresher environmental awareness training is available as and when required; | ECO / cEO / dEO | Present refresher environmental awareness training sessions | | | | |
| All staff are aware of the conditions and controls linked to the EA and within the EMPr and made aware of their individual roles and responsibilities in achieving compliance with the EA and EMPr; | | Ensure that the EA and EMPr is readily available either via a hardcopy document or online | | | | Photographic evidence (for hardcopy) and EMPr filing system<br><br>Training attendance register |
| The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum:<br>Safety notifications; and No littering. | Contractor / cEO | Place clearly visible posters at important locations. | | | | Photographic record |
| Environmental awareness training must include as a minimum the following:<br>Description of significant environmental | ECO / cEO / dEO | Include in environmental awareness training resources | Construction | ECO | Monthly | Environmental awareness training material |

| **Impact management outcome:** All onsite staff are aware and understands the individual responsibilities in terms of this EMPr. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe of implementation | Responsible person | Frequency | Evidence of compliance |
| impacts, actual or potential, related to their work activities;<br>Mitigation measures to be implemented when carrying out specific activities;<br>Emergency preparedness and response procedures;<br>Emergency procedures;<br>Procedures to be followed when working near or within sensitive areas;<br>Wastewater management procedures;<br>Water usage and conservation;<br>Solid waste management procedures;<br>Sanitation procedures;<br>Fire prevention; and<br>Disease prevention. | | | | | | |
| A record of all environmental awareness training courses undertaken as part of the EMPr must be available; | | | | | | |
| Educate workers on the dangers of open and/or unattended fires; | | Filing system including all proof of training | | | | File with proof of training |
| A staff attendance register of all staff to have received environmental awareness training must be available. | | Provide environmental awareness training resources in the required languages | | | | |
| Course material must be available and presented in appropriate languages that all staff can understand. | ECO / cEO/ dEO | Include in environmental awareness training resources | Construction | ECO | Monthly | Environmental awareness training material |

**5.2. Site Establishment development**

**Impact management outcome:** Impacts on the environment are minimised during site establishment and the development footprint are kept to demarcated development area.

| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
|---|---|---|---|---|---|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| A method statement must be provided by the contractor prior to any onsite activity that includes the layout of the construction camp in the form of a plan showing the location of key infrastructure and services (where applicable), including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous materials storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management; | Contractor | Method statement with layout plan of the construction camp / laydown area as per the requirements | Pre-Construction | ECO | Once, prior to construction | Method statement that is compliant with the listed minimum requirements |
| Location of camps must be within approved area to ensure that the site does not impact on sensitive areas identified in the environmental assessment or site walk through; | dEO | | | | | Layout and sensitivity map indicate avoidance of sensitive areas |
| Sites must be located where possible on previously disturbed areas; | | | | | | |
| The camp must be fenced in accordance with ***Section5.5: Fencing and gate installation***; and | Contractor | Erect fencing in accordance with requirements | Pre-Construction | ECO | | Camp is fenced in accordance with **Section5.5.** |

| **Impact management outcome:** Impacts on the environment are minimised during site establishment and the development footprint are kept to demarcated development area. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | listed in **Section5.5.** | | | | |
| The use of existing accommodation for contractor staff, where possible, is encouraged. | | Identify and utilize pre-existing accommodation if available | | ECO | Once, prior to construction | Available accommodation is utilized where available |

**5.3. Access restricted areas**

| **Impact management outcome:** Access to restricted areas prevented. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| Identification of access restricted areas is to be informed by the environmental assessment, site walk through, and any additional areas identified during development; | cEO & dEO | Establish access restricted areas | Pre-Construction, Construction & Operation | ECO | Continuous | Photographic evidence |
| Erect, demarcate and maintain a temporary barrier with clear signage around the perimeter of any access restricted area, colour coding could be used if appropriate; | | Erect appropriate temporary barriers around access restricted areas | | | | |
| Unauthorised access and development related activity inside access restricted areas is prohibited. | | | | | | |

**5.4. Access roads**

| **Impact management outcome:** Minimise impact to the environment through the planned and restricted movement of vehicles on site. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| An access agreement must be formalised and signed by the DPM, Contractor and landowner before commencing with the activities; | DPM & Contractor | Formalize and sign access agreements with affected landowners | Pre-Construction | ECO | Once, prior to construction | Signed agreements filed in system |

| **Impact management outcome:** Minimise impact to the environment through the planned and restricted movement of vehicles on site. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| All private roads used for access to the servitude must be maintained and upon completion of the works, be left in at least the original condition | Contractor | Conduct maintenance activities on private roads used for construction | Construction & Rehabilitation | ECO | Weekly | Photographic record of access roads documenting condition |
| All contractors must be made aware of all these access routes. | DSS | Provide a map showing all access routes associated with the project | Pre-construction Construction Operation | | | Access route map available; |
| Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the contractor's expense; | Contractor | All access route deviations are closed and re-vegetated | Pre-construction Construction Operation | ECO/ dEO /cEO | | Photographic evidence of the closure of access roads and re-vegetation |
| Maximum use of both existing servitudes and existing roads must be made to minimize further disturbance through the development of new roads; | Contractor, cEO & DPM | Existing roads to be used are specified and development of new roads are avoided. | Pre-construction Construction Operation | ECO / cEO | | Approved routes are utilized. |
| In circumstances where private roads must be used, the condition of the said roads must be recorded in accordance with ***Section 4.9: photographic record***; prior to use and the condition thereof agreed by the landowner, the DPM, and the contractor; | DPM & Contractor | Record the conditions of private roads to be used as per the requirements of section 4.9 and agree on the required condition of the | Pre-construction | ECO | Once, prior to road use | Photographic evidence of road conditions prior to use. |

| **Impact management outcome:** Minimise impact to the environment through the planned and restricted movement of vehicles on site. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | roads with the landowner, DPM and contractor | | | | |
| Access roads in flattish areas must follow fence lines and tree belts to avoid fragmentation of vegetated areas or croplands | DPM & dEO | Access route map is designed to follow fence lines and/or tree belts and avoid vegetated areas. | | ECO / dEO / cEO | Once, prior to construction | Approved routes are utilized |
| Access roads must only be developed on a pre-planned and approved road. | DPM & dEO | Access roads constructed only on pre-approved roads | Construction | ECO | Once, prior to construction | Roads developed along pre-approved routes |

**5.5. Fencing and Gate installation**

| **Impact management outcome:** Minimise impact to the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| Use existing gates provided to gain access to all parts of the area authorised for development, where possible; | DSS & Contractor | Identify and inform all relevant staff of the existing gates to be used | Construction | ECO & DSS | Monthly | Existing gates are utilized regularly and new gates are developed only if necessary |
| Existing and new gates to be recorded and documented in accordance with **section *4.9: photographic record***; | | Existing and new gates will be recorded and documented as per the requirements of section 4.9 | | | Once, after the construction of all new gates has been completed | Photographic evidence of the existing and new gates as per the requirements of section 4.9 |

| **Impact management outcome:** Minimise impact to the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| All gates must be fitted with locks and be kept locked at all times during the development phase, unless otherwise agreed with the landowner; | | All gates are fitted with locks and are always locked | | | Weekly | All gates are locked at all times |
| At points where the line crosses a fence in which there is no suitable gate within the extent of the line servitude, on the instruction of the DPM, a gate must be installed at the approval of the landowner; | DPM & DSS | New gate installed | Construction | ECO | Twice, before and after new gate is installed | Photographic evidence of the existing and new gates as per the requirements of section 4.9 |
| Care must be taken that the gates must be so erected that there is a gap of no more than 100 mm between the bottom of the gate and the ground; | Contractor | Ensure that there is a gap of no more than 100 mm between the bottom of the gate and the ground | | ECO, DSS, dEO and cEO | Once, after gate is installed | New gate meets requirement |
| Where gates are installed in jackal proof fencing, a suitable reinforced concrete sill must be provided beneath the gate; | | Install a suitable reinforced concrete sill must be provided beneath the gate | | | | |
| Original tension must be maintained in the fence wires; | | Maintain original tension of fences during activities | Pre-Construction & Construction | ECO & DSS | Monthly | No tension reduction in fence wires |
| All gates installed in electrified fencing must be re-electrified; | | Re-electrify gates installed in electrified fencing | Pre-Construction | | Once, after installation of gates | Gates installed in electrified fencing are electrified |
| All demarcation fencing and barriers must be maintained in good working order for the duration of the development activities; | | Maintain fencing and barriers in good working order | Pre-Construction & Construction | | Monthly | Photographic record of condition of fences erected |

| **Impact management outcome:** Minimise impact to the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| Fencing must be erected around the camp, batching plants, hazardous storage areas, and all designated access restricted areas, where applicable; | | Erect fencing around construction camps, batching plants, hazardous storage areas and access restricted areas. | Construction | | Once, when fencing has been erected | Photographic evidence of erected fences. |
| Any temporary fencing to restrict the movement of life-stock must only be erected with the permission of the landowner. | Contractor and dEO/cEO | Obtain written approval from the relevant landowner where temporary fencing is required to restrict livestock movement | Pre-Construction & Construction | ECO | To be monitored as temporary fencing is required | Landowner's written approval to be provided by the dEO/cEO |
| All fencing must be developed of high-quality material bearing the SABS mark; | Contractor | High-quality material bearing the SABS mark is used for fencing | During construction of fencing | ECO & DSS | To be monitored as fencing is erected | Fencing materials used bears SABS mark |
| The use of razor wire as fencing must be avoided; | Contractor and dEO/cEO | Razor wire must be excluded from fencing materials | Pre-Construction & Construction | | | Fences erected do not include razor wire |
| Fenced areas with gate access must remain locked after hours, during weekends and on holidays if staff is away from site. Site security will be required at all times; | DSS, Contractor and dEO/cEO | Ensure fenced areas are locked as required through the implementation of a formalised process. Appoint a security company | Construction | ECO | Weekly and when required | Fences are locked and no complaints from landowners are received. A security company is appointed |
| On completion of the development phase all temporary fences are to be removed; | Contractor | All temporary fences are to be removed | Post-construction | ECO & DSS | Once, after the construction phase is complete | No temporary fences associated with the project are present following the completion of the |

| **Impact management outcome:** Minimise impact to the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | | construction phase |
| The contractor must ensure that all fence uprights are appropriately removed, ensuring that no uprights are cut at ground level but rather removed completely. | | No uprights are cut at ground level, but are removed completely | | | | Uprights associated with the project are all completely removed |

**5.6. Water Supply Management**

| **Impact management outcome:** Undertake responsible water usage**.** | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| All abstraction points or boreholes must be registered with the DWS and suitable water meters installed to ensure that the abstracted volumes are measured on a daily basis; | DPM & dEO | Register abstraction boreholes with the DWS and install water meters. | Pre-construction | ECO | Once, prior to construction | Authorisation from the DWS and photographic evidence of water meters |

| **Impact management outcome:** Undertake responsible water usage**.** | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| The Contractor must ensure the following:<br>The vehicle abstracting water from a river does not enter or cross it and does not operate from within the river;<br>No damage occurs to the river bed or banks and that the abstraction of water does not entail stream diversion activities; and<br>All reasonable measures to limit pollution or sedimentation of the downstream watercourse area implemented. | N/A – no water will be abstracted from rivers | | | | | |
| Ensure water conservation is being practiced by:<br>• Minimising water use during cleaning of equipment;<br>• Undertaking regular audits of water systems; and<br>• Including a discussion on water usage and conservation during environmental awareness training.<br>• The use of grey water is encouraged | DSS, Contractor and dEO/cEO | Execute the required water conservation measures throughout on- site construction processes | Construction | ECO | Monthly and when required | Successful implementation of water conservation |

**5.7. Storm and waste water management**

| **Impact management outcome:** Impacts to the environment caused by storm water and wastewater discharges during construction are avoided. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| Runoff from the cement/ concrete batching areas must be strictly controlled, and contaminated water must be collected, stored and either treated or disposed of off-site, at a location approved by the project manager; | Contractor and cEO | Measures for the control and management of runoff must be implemented | Construction | ECO | Weekly | Effective management of runoff or contaminated water from the temporary concrete batching plant |
| All spillage of oil onto concrete surfaces must be controlled by the use of an approved absorbent material and the used absorbent material disposed of at an appropriate waste disposal facility; | | Obtain approved absorbent material and ensure waste disposal should be at a licensed hazardous disposal facilities | | | | Availability of approved absorbent material (e.g. drip trays and spill kits) at the construction site and proof of disposal of oil at licensed disposal facilities |
| Natural storm water runoff not contaminated during the development and clean water can be discharged directly to watercourses and water bodies, subject to the Project Manager's approval and support by the ECO; | DPM in consultation with the ECO | Consultation between the DPM and the ECO to determine if water can be discharged directly into water bodies (where present). | | | As and when the need arises to discharge natural stormwater runoff and clean water | Proof of consultation between the DPM and ECO and the outcomes thereof are to be provided. Proof of water quality testing and the results thereof. |
| Water that has been contaminated with suspended solids, such as soils and silt, may be released into watercourses or water bodies only once all suspended solids have been removed from the | N/A | | | | | |

| **Impact management outcome:** Impacts to the environment caused by storm water and wastewater discharges during construction are avoided. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| water by settling out these solids in settlement ponds. The release of settled water back into the environment must be subject to the Project Manager's approval and support by the ECO. | | | | | | |

**5.8. Solid and hazardous waste management**

| **Impact management outcome:** Wastes are appropriately stored, handled and safely disposed of at a recognised waste facility**.** | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| All measures regarding waste management must be undertaken using an integrated waste management approach; | Contractor & cEO | Develop and implement a waste management plan | Construction | ECO | Monthly | Implementation of the waste management plan and proof of waste management through proof of responsible disposal |
| Sufficient, covered waste collection bins (scavenger and weatherproof) must be provided; | | Appropriate waste collection bins must be strategically placed throughout the site | | | Continuous | Photographic evidence of appropriate waste collection bins available throughout the site |
| A suitably positioned and clearly demarcated waste collection site must be identified and provided; | | Identify an appropriate location for the waste collection site which must be clearly demarcated through signage and temporary fencing | | | Once, prior to the start of construction | Photographic evidence of a waste collection site that is appropriately placed and demarcated |
| The waste collection site must be maintained in a clean and orderly manner; | | Regular collection of waste and maintenance of the area must be undertaken as per the waste requirements for the project during construction | | | Continuous | The waste collection site is maintained and clean |

| **Impact management outcome:** Wastes are appropriately stored, handled and safely disposed of at a recognised waste facility**.** | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| Waste must be segregated into separate bins and clearly marked for each waste type for recycling and safe disposal; | Contractor & cEO | Provide separate and clearly marked bins for the different waste types associated with the construction phase | Construction | ECO | Continuous | Photographic evidence of separate and clearly marked waste bins are available on site. Waste generated is separated into the relevant bins. |
| Staff must be trained in waste segregation; | | Include waste segregation as part of the environmental awareness training material | | | Monthly and when required | Environmental awareness training material |
| Bins must be emptied regularly; | | Bins must be emptied before reaching total capacity and on a regular basis as required for the project | | | Monthly | Bins are emptied regularly |
| General waste produced onsite must be disposed of at registered waste disposal sites/ recycling company; | | Disposal of general waste at licensed waste disposal facilities must be undertaken as per the waste management plan | | | | Disposal certificates of disposal at licensed facilities to be provided |
| Hazardous waste must be disposed of at a registered waste disposal site; | | Disposal of hazardous waste at licensed waste disposal facilities must be undertaken | | | | |

| **Impact management outcome:** Wastes are appropriately stored, handled and safely disposed of at a recognised waste facility**.** | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | as per the waste management plan | | | | |
| Certificates of safe disposal for general, hazardous and recycled waste must be maintained | | Obtain and file certificates for safe disposal of waste | | | | Disposal certificates of disposal at licensed facilities available on filing system |

**5.9. Protection of watercourses and estuaries**

| **Impact management outcome:** Pollution and contamination of the watercourse environment and or estuary erosion are prevented. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| All watercourses must be protected from direct or indirect spills of pollutants such as solid waste, sewage, cement, oils, fuels, chemicals, aggregate tailings, wash and contaminated water or organic material resulting from the Contractor's activities; | Contractor & cEO | Contractor's activities to be undertaken in demarcated areas outside of watercourses. Temporary bunds to be made around footprint of Contractor's activities. | Construction | ECO | Weekly | No reported incidents of pollutant spillage. |
| In the event of a spill, prompt action must be taken to clear the polluted or affected areas; | | Create a management plan or process for spillage and execute when necessary | | | | Written feedback from the contractor regarding the spill's management. Photographic evidence of the execution of the spill's management process followed. |
| Where possible, no development equipment must traverse any seasonal or permanent wetland | | Develop a Method statement on how to traverse any seasonal or permanent wetland | | | | No traversing of any seasonal or permanent wetland or following of the method statement where required. |
| No return flow into the estuaries must be allowed and no disturbance of the | N/A – no estuaries present in development area | | | | | |

| **Impact management outcome:** Pollution and contamination of the watercourse environment and or estuary erosion are prevented. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| Estuarine functional Zone should occur; | | | | | | |
| Development of permanent watercourse or estuary crossing must only be undertaken where no alternative access to tower position is available | Contractor & cEO | Ensure that permanent crossings are developed only where no alternative crossing is available. | Pre-construction/Construction | ECO | Continuous | Permanent crossings only where no alternative is available. |
| There must not be any impact on the long term morphological dynamics of watercourses or estuaries; | DPM, dEO & cEO | Develop a method statement for development within a watercourse and follow mitigation measures recommended by the wetland specialist.<br><br>Develop a rehabilitation plan for the disturbed watercourse areas. | Construction | ECO | Weekly | Method statement including recommended mitigation measures and implementation of the method statement.<br><br>Development and implementation of a rehabilitation plan for the affected watercourses. |
| Existing crossing points must be favored over the creation of new crossings (including temporary access) | Contractor, DPM, dEO & cEO | Ensure existing crossings are used where possible. | | | | Use of existing crossings where possible. |

| **Impact management outcome:** Pollution and contamination of the watercourse environment and or estuary erosion are prevented. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| When working in or near any watercourse or estuary, the following environmental controls and consideration must be taken:<br>Water levels during the period of construction; No altering of the bed, banks, course or characteristics of a watercourse<br>During the execution of the works, appropriate measures to prevent pollution and contamination of the riparian environment must be implemented e.g. including ensuring that construction equipment is well maintained;<br>Where earthwork is being undertaken in close proximity to any watercourse, slopes must be stabilised using suitable materials, i.e. sandbags or geotextile fabric, to prevent sand and rock from entering the channel; and<br>Appropriate rehabilitation and re-vegetation measures for the watercourse banks must be implemented timeously. In this regard, the banks should be appropriately and incrementally stabilised as soon as | Contractor & cEO | Activities undertaken near watercourses must be in-line with and consider the specified environmental controls | | | | No degradation of the watercourses and no incidents of destruction reported<br><br>Rehabilitation and re-vegetation of watercourse banks (where applicable) as soon as the development allows |

| **Impact management outcome:** Pollution and contamination of the watercourse environment and or estuary erosion are prevented. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| development allows. | | | | | | |

**5.10. Vegetation clearing**

| **Impact management outcome:** Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| **General:** | | | | | | |
| Indigenous vegetation which does not interfere with the development must be left undisturbed; | Contractor & cEO | Demarcate areas of indigenous vegetation to be avoided before clearance is undertaken | Pre-Construction & Construction | ECO | Weekly | No unnecessary clearance of indigenous vegetation is undertaken |
| Protected or endangered species may occur on or near the development site. Special care should be taken not to damage such species; | | Demarcate areas containing protected or endangered species to be avoided by construction activities | Pre-Construction | | | No clearance of protected or endangered species other than those permitted to be removed |
| Search, rescue and replanting of all protected and endangered species likely to be damaged during project development must be identified by the relevant specialist and completed prior to any development or clearing; | Relevant specialist in consultation with the Contractor and the cEO | Develop and implement a Plant Search and Rescue Plan | Pre-construction & Construction | | | Successful implementation of the Plant Search and Rescue Plan and photographic evidence and notes thereof if required |
| Permits for removal must be obtained from the relevant CA prior to the cutting or clearing of the affected species, and they must be filed; | DPM & ECO | Commence the permitting process in order to obtain the relevant permits for the removal of protected species. Permits kept on file | Pre-construction | | Once, prior to the commencement of the construction phase and removal of the | Permits from the relevant CA if required |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | protected species | |
| The Environmental Audit Report must confirm that all identified species have been rescued and replanted and that the location of replanting is compliant with conditions of approvals; | ECO | Ensure that the audit report indicates all species rescued and replanted and provides feedback in terms of compliance with the conditions of permits for replanting | Construction | dEO & DPM | Once, following construction activities | Environmental Audit Report including items specified in this impact management action |
| Trees felled due to construction must be documented and form part of the Environmental Audit Report; | | Ensure that the audit report documents the details of trees felled | | | Once, following construction activities | Environmental Audit Report including items specified in this impact management action |
| Rivers and watercourses must be kept clear of felled trees, vegetation cuttings and debris; | Contractor | Removal of cleared vegetation from watercourses (where applicable). Felled trees, vegetation cuttings and debris must be disposed of at a licensed waste disposal facility. | | ECO | Monthly | No felled trees, vegetation cuttings and debris are dumped in inappropriate locations and disposal certificates are available on filing system as proof of responsible disposal |
| Only a registered pest control operator may apply herbicides on a commercial basis and commercial application must be carried out under the supervision of a registered pest control operator, supervision of a registered pest control operator or is appropriately trained; | Contractor & cEO | Appoint a suitably qualified pest control operator, if required. | Construction & Operation | | If and when the use of herbicide is required | Only registered pest control operators must be appointed and proof of their registration must be available on the filing system |

| | | | | | | |
|---|---|---|---|---|---|---|
| A daily register must be kept of all relevant details of herbicide usage; | | Develop a daily register for the documentation of the details of herbicide usage, if required. | | | | Daily register with information on herbicides used is available |
| No herbicides must be used in estuaries; | N/A | | | | | |
| All protected species and sensitive vegetation not removed must be clearly marked and such areas fenced off in accordance to ***Section 5.3: Access restricted areas***. | Contractor & cEO in consultation with the cEO | Spatially demarcate protected species and sensitive vegetation and implement appropriate fencing where required as per section 5.3 | Construction & Operation | ECO | Once, prior to construction | Demarcation and fencing is undertaken in-line with the requirements of section 5.3 |
| Alien invasive vegetation must be removed and disposed of at a licensed waste management facility. | Contractor, cEO & dEO | Any alien vegetation that is removed is disposed of at a licensed waste management facility | Construction & Operation | | Monthly | Disposal certificates for alien vegetation at licensed facilities available on filing system |

**5.11. Protection of fauna**

| **Impact management outcome:** Disturbance to fauna is minimised. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| No interference with livestock must occur without the landowner's written consent and with the landowner or a person representing the landowner being present; | dEO / cEO & Contractor | Develop a procedure for dealing with livestock within the affected properties | Pre-construction & Construction | ECO | Once, prior to the commencement of construction and as and when required during the construction phase | Written consent provided by the landowner and proof of representation of the landowner during interference |
| The breeding sites of raptors and other wild birds species must be taken into consideration during the planning of the development programme; | dEO & cEO in consultation with the Contractor | Ensure that the planning and development programme considers breeding sites for wild bird species | | | Once, prior to the commencement of construction and as and when required | The planning and development programme has factored in the consideration of breeding sites for wild bird species |
| Breeding sites must be kept intact and disturbance to breeding birds must be avoided. Special care must be taken where nestlings or fledglings are present; | | Avoid breeding sites and ensure that special care is taken in the presence of nestlings and fledglings | Construction & Operation | | Weekly, and as an when required during the construction.<br><br>Monthly, and as and when required during operation. | Photographic evidence of intact breeding sites |
| Special recommendations of the avian specialist must be adhered to at all times to prevent unnecessary disturbance of birds; | | All mitigation measures recommended by the avifauna specialist must be | | | Weekly during construction and monthly during operation | Photographic evidence of compliance and successful implementation of the recommended |

| **Impact management outcome:** Disturbance to fauna is minimised. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | implemented | | | | measures |
| No poaching must be tolerated under any circumstances.<br>All animal dens in close proximity to the works areas must be marked as Access restricted areas | dEO / cEO in consultation with the Contractor | All site staff must be informed of this requirement during the Environmental Awareness Training and the consequences of not adhering to the requirement. These areas must be demarcated as Access Restricted Areas | Construction & Operation | ECO | Monthly, and as and when required | No poaching is reported |
| No deliberate or intentional killing of fauna is allowed; | | All site staff must be informed of this requirement during the Environmental Awareness Training and the consequences of not adhering to the requirement. | | | | No fauna killings are reported. |
| In areas where snakes are abundant, snake deterrents to be deployed on the pylons to prevent snakes climbing up, being electrocuted and causing power | | Implement and maintain snake deterrents on pylons in areas where snakes are | | | Once, during the construction of the pylons and as and when required. | Photographic record of the implementation and maintenance of snake deterrents |

| **Impact management outcome:** Disturbance to fauna is minimised. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| outages; and | | abundant | | | Monthly during operation | |
| No Threatened or Protected species (ToPs) and/or protected fauna as listed according NEMBA (Act No. 10 of 2004) and relevant provincial ordinances may be removed and/or relocated without appropriate authorisations/permits. | DPM in consultation with the ECO | Undertake a permitting process to obtain the required permits | Pre-Construction | ECO | Once, prior to the commencement of construction and as and when required | Permits for removal and/relocation must be available on the filing system |

**5.12. Protection of heritage resources**

| **Impact management outcome:** Impact to heritage resources is minimised. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| Identify, demarcate and prevent impact to all know sensitive heritage features on site in accordance with the No-Go procedure in ***Section 5.3: Access restricted areas***; | cEO in consultation with the ECO | Undertake a Heritage Walk-through Survey. Spatially identify and demarcate areas of heritage significance as per the Heritage Impact Assessment and the Heritage Walk-through Report and as per the requirements of section 5.3 | Pre-construction | ECO | Once, prior to the start of construction | Proof of avoidance of sensitive heritage features through details of avoidance and photographic evidence |
| Carry out general monitoring of excavations for potential fossils, artefacts and material of heritage importance; | Suitably qualified specialist in consultation with the ECO | Appoint a suitably qualified specialist to carry out the monitoring of excavations for fossils, artefacts and important heritage material where required | Construction | | During the undertaking of excavations, if required | Proof of appointment of a suitably qualified specialist and photographic evidence of required monitoring by the specialist |
| All work must cease immediately, if any human remains and/or other archaeological, palaeontological and historical material are uncovered. Such material, if exposed, must be reported to the nearest museum, archaeologist/ | cEO in consultation with the Contractor and ECO | Develop and implement protocols for situations where human remains, archaeological, palaeontological or | | | When required | Proof of work ceased and the required protocols executed in cases where material is discovered. |

| **Impact management outcome:** Impact to heritage resources is minimised. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| palaeontologist (or the South African Police Services), so that a systematic and professional investigation can be undertaken. Sufficient time must be allowed to remove/collect such material before development recommences. | | historical material are discovered | | | | |

**5.13. Safety of the public**

| **Impact management outcome:** All precautions are taken to minimise the risk of injury, harm or complaints. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| Identify fire hazards, demarcate and restrict public access to these areas as well as notify the local authority of any potential threats e.g. large brush stockpiles, fuels etc.; | cEO in consultation with the Contractor | Develop an Emergency Preparedness, Response and Fire Management Plan specific to the project | Pre-construction & Construction | ECO | Once, prior to the start of construction and weekly during the construction phase | Compliance with the Emergency Preparedness, Response and Fire Management Plan |
| All unattended open excavations must be adequately fenced or demarcated; | Contractor & cEO | Ensure that all excavations undertaken is fenced and demarcated within a reasonable timeframe and in instances where excavations will be open for long-periods of time | Construction | | Weekly | Photographic evidence of excavations fenced where required |
| Adequate protective measures must be implemented to prevent unauthorised access to and climbing of partly constructed towers and protective scaffolding; | | All staff must be easily identifiable and the climbing of towers and scaffolding must be undertaken by authorized personnel as managed by the Contractor | | | | No incidents of unauthorised climbing are reported |

| **Impact management outcome:** All precautions are taken to minimise the risk of injury, harm or complaints. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| Ensure structures vulnerable to high winds are secured; | Contractor and cEO | Ensure that sufficient stabilisation measures are implemented to secure structures vulnerable to high winds | Construction | ECO | Continuous | No incidents of unstable structures due to high winds is reported |
| Maintain an incidents and complaints register in which all incidents or complaints involving the public are logged. | cEO & dEO | Create and maintain an incidents and complaints register | Pre-construction, Construction & Operation | | Monthly | Up-to-date incidents and complaints register available on filing system |

### 5.14. Sanitation

| **Impact management outcome:** Clean and well maintained toilet facilities are available to all staff in an effort to minimise the risk of disease and impact to the environment. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| Mobile chemical toilets are installed onsite if no other ablution facilities are available; | Contractor & cEO | Mobile chemical toilets must be placed appropriately and in areas that avoid environmental sensitivities | Construction | ECO | Weekly | Mobile toilets are installed and avoid environmental sensitivities |

| **Impact management outcome:** Clean and well maintained toilet facilities are available to all staff in an effort to minimise the risk of disease and impact to the environment. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| The use of ablution facilities and or mobile toilets must be used at all times and no indiscriminate use of the veld for the purposes of ablutions must be permitted under any circumstances; | | All site staff must be informed of this requirement during the Environmental Awareness Training and the consequences of not adhering to the requirement | Pre-construction & Construction | | | No evidence of non-compliance identified |
| Where mobile chemical toilets are required, the following must be ensured:<br>Toilets are located no closer than 100 m to any watercourse or water body;<br>Toilets are secured to the ground to prevent them from toppling due to wind or any other cause;<br>No spillage occurs when the toilets are cleaned or emptied and the contents are managed in accordance with the EMPr;<br>Toilets have an external closing mechanism and are closed and secured from the outside when not in use to prevent toilet paper from being blown out;<br>Toilets are emptied before long weekends and workers holidays, and must be locked after working hours;<br>Toilets are serviced regularly and the ECO | Contractor & cEO | The installation of the toilets by the Contractor must be as per the listed requirements | Construction | ECO | Weekly | No evidence of non-compliance identified |

| **Impact management outcome:** Clean and well maintained toilet facilities are available to all staff in an effort to minimise the risk of disease and impact to the environment. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| must inspect toilets to ensure compliance to health standards; | | | | | | |
| A copy of the waste disposal certificates must be maintained. | | File certificates received from a licensed waste disposal facility | | | | Certificates from a licenced disposal site available on file. |

**5.15. Prevention of disease**

| **Impact Management outcome:** All necessary precautions linked to the spread of disease are taken. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| Undertake environmentally-friendly pest control in the camp area; | Contractor & cEO | Only environmentally-friendly pest control must be used, when required | Construction | ECO | As pest control is needed for the project | Contractor to provide proof of pest control used being environmentally-friendly |
| Ensure that the workforce is sensitised to the effects of sexually transmitted diseases, especially HIV AIDS; | Contractor & cEO in consultation with ECO | The effects of sexually transmitted diseases and HIV/ AIDS must be covered in the Environmental Awareness Training | Pre-construction & Construction | | Once, prior to the commencement of construction and monthly during construction | Environmental awareness training material and attendance register |
| The Contractor must ensure that information posters on AIDS are displayed in the Contractor Camp area; | Contractor & cEO | Develop and place information posters on HIV/ AIDS | Construction | | Weekly | Photographic evidence of poster placement |
| Information and education relating to sexually transmitted diseases to be made available to both construction workers and local community, where applicable; | Contractor & cEO in consultation with ECO | Information and education of sexually transmitted diseases must be covered in the Environmental Awareness Training. | Pre-construction & Construction | | Monthly | Environmental awareness training material and attendance register |
| Free condoms must be made available to all staff on site at central points | Contractor | Condoms to be placed in mobile | Construction Phase | | | Photographic evidence of |

| **Impact Management outcome:** All necessary precautions linked to the spread of disease are taken. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | toilets and at the construction camps | | | | placement of free condoms by the contractor to be provided |
| Medical support must be made available; | dEO / cEO in consultation with the Contractor | Ensure that designated personnel with first aid training are available on site and that first aid kits to provide medical support are readily available | Pre-construction, Construction and Operation | ECO | Monthly | Monitor the availability of first aid trained personnel and contents of medical kits |
| Provide access to Voluntary HIV Testing and Counselling Services. | Contractor | Create an HIV testing schedule and provide counselling services where required | Construction | | Quarterly, and as and when required | Voluntary testing schedules and proof of counselling (where undertaken) |

### 5.16. Emergency procedures

| **Impact management outcome:** Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |

| **Impact management outcome:** Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| Compile an Emergency Response Action Plan (ERAP) prior to the commencement of the proposed project; | Contractor in consultation with the cEO | Develop an Emergency Preparedness, Response and Fire Management Plan specific to the project | Pre-construction | ECO | Once, prior to the start of construction | Emergency Preparedness, Response and Fire Management Plan compiled and available on filing system |
| The Emergency Plan must deal with accidents, potential spillages, and fires in line with relevant legislation; | Contractor & cEO | Develop an Emergency Preparedness, Response and Fire Management Plan specific to the project which covers accidents, potential spillages and fires | Pre-construction | ECO | Once, prior to the start of construction | Emergency Preparedness, Response and Fire Management Plan meets required specifications |
| All staff must be made aware of emergency procedures as part of environmental awareness training; | cEO / dEO in consultation with the ECO | Develop environmental awareness training material which covers the relevant emergency procedures | | | Prior to the commencement of the environmental awareness training | Environmental awareness training material and attendance register |
| The relevant local authority must be made aware of a fire as soon as it starts; | Contractor in consultation with the DPM & dEO | Develop and include a procedure in the Emergency Preparedness, | Construction & Operation | | If a fire occurs | Evidence that the local authority was informed as per the relevant procedure set out |

| **Impact management outcome:** Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | Response and Fire Management Plan for the event of a fire and the procedure to be followed for informing the local authority | | | | in the Emergency Preparedness, Response and Fire Management Plan |
| In the event of emergency necessary mitigation measures to contain the spill or leak must be implemented (see ***Hazardous Substances section 5.17***). | Contractor & cEO | Implement the required mitigation measures in the event of a spill or leak as per the requirements of Section 5.17. | | | If a spill or leak occurs | The mitigation measures included under Section 5.17 have been followed. |

**5.17. Hazardous substances**

**Impact management outcome:** Safe storage, handling, use and disposal of hazardous substances.

| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
|---|---|---|---|---|---|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| The use and storage of hazardous substances to be minimized and non-hazardous and non-toxic alternatives substituted where possible | Contractor & cEO | Develop a strategy of how hazardous substances can be and should be minimised | Pre-construction & Construction | ECO | Once, prior to the commencement of construction and monthly during the construction phase | Contractor to provide evidence of substances used for proof of compliance |
| All hazardous substances must be stored in suitable containers as defined in the Method Statement; | | Develop a Method Statement for the storage of hazardous substances in appropriate containers | Construction | | Once, prior to the commencement of construction and weekly during the construction phase | Photographic evidence that hazardous substances are stored in appropriate containers as per the requirements of the relevant Method Statements |
| Containers must be clearly marked to indicate contents, quantities and safety requirements; | | | | | Once, prior to the commencement of construction and monthly during the construction phase | |
| All storage areas must be bunded. The bunded area must be of sufficient capacity to contain a spill / leak from the stored containers; | | Hazardous material storage areas must be bunded to contain a spill / leak | | | | Photographic evidence of adequate bunding |
| Bunded areas to be suitably lined with a SABS approved liner; | | Bunded areas must be suitably lined | | | | |
| An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and kept up to date on a | | Compile and update an Alphabetical Hazardous | | | Monthly, and as and when required | Complete and up to date control sheet provided by the Contractor |

| **Impact management outcome:** Safe storage, handling, use and disposal of hazardous substances. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| continuous basis; | | Chemical Substance (HCS) control sheet specific to the project | | | | |
| All hazardous chemicals that will be used on site must have Material Safety Data Sheets (MSDS); | Contractor & cEO | Keep a record of all hazardous chemicals and the respective MSDS | Construction | ECO | Monthly, and as and when required | Record of hazardous chemicals and the respective MSDS |
| All employees working with HCS must be trained in the safe use of the substance and according to the safety data sheet; | | Provide training to personnel working with HCS | Pre-construction and Construction | | Once, prior to the commencement of construction and as and when required | Record of training provided to personnel working with HCS |
| Employees handling hazardous substances / materials must be aware of the potential impacts and follow appropriate safety measures. Appropriate personal protective equipment must be made available; | | Develop environmental awareness training material which covers the relevant impacts and safety measures. Provide appropriate training and personal protective equipment for the relevant personnel | | | Prior to the commencement of the environmental awareness training and monthly during the construction phase for personal protective equipment | Environmental awareness training material.<br><br>All relevant personnel have undergone appropriate training and have access to personal protective equipment |

| **Impact management outcome:** Safe storage, handling, use and disposal of hazardous substances. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | handling hazardous substances and materials equipment for the relevant personnel handling hazardous substances and materials | | | | |
| The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowsers; | Contractor & cEO | Appropriate storage facilities must be constructed or obtained for the storing of diesel, other liquid fuel, oil and hydraulic fluid | Construction | | Monthly, and as and when required | Storage tanks for the project are appropriate and no incidents are reported in this regard |
| The tanks/ bowsers must be situated on a smooth impermeable surface (concrete) with a permanent bund. The impermeable lining must extend to the crest of the bund and the volume inside the bund must be 130% of the total capacity of all the storage tanks/ bowsers (110% statutory requirement plus an allowance for rainfall); | | | | ECO | | |
| The floor of the bund must be sloped, draining to an oil separator; | | Appropriate storage facilities must be constructed as per the requirements | | | Once, during construction | Bunded storage areas are constructed according to the requirements |

| **Impact management outcome:** Safe storage, handling, use and disposal of hazardous substances. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | listed | | | | |
| Provision must be made for refueling at the storage area by protecting the soil with an impermeable groundcover. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained; | | Appropriately constructed refueling facility must be developed as per the requirements. Drip trays must be provided for use | | | Continuous | Soils at the refuelling facility are protected as required and drip trays are provided and used |
| All empty externally dirty drums must be stored on a drip tray or within a bunded area; | | Ensure that empty dirty drums are stored appropriately according to a waste method statement | | | | Drip trays or bunded areas are used for the storage of dirty drums.<br><br>Waste Method Statement on file |
| No unauthorised access into the hazardous substances storage areas must be permitted; | | Ensure through the implementation of procedures that no unauthorised access is undertaken into the storage areas | | | | No non-compliances recorded.<br><br>Implementation of procedures. |
| No smoking must be allowed within the vicinity of the hazardous storage areas; | | Inform all employees of the requirement and | | | | Photographic record of signage placed |

| **Impact management outcome:** Safe storage, handling, use and disposal of hazardous substances. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | develop and place relevant signage in the relevant areas | | | | |
| Adequate fire-fighting equipment must be made available at all hazardous storage areas; | | Hazardous storage areas must be fitted with adequate fire-fighting equipment | | | Monthly | Adequate fire-fighting equipment is available and has been serviced |
| Where refueling away from the dedicated refueling station is required, a mobile refueling unit must be used. Appropriate ground protection such as drip trays must be used; | Contractor & cEO | Provide a mobile refueling unit as well as suitable ground protection, where required | Construction | ECO | Continuous | A mobile refueling unit and suitable ground protection is available for use |
| An appropriately sized spill kit kept onsite relevant to the scale of the activity/s involving the use of hazardous substance must be available at all times; | | Provide an appropriate spill kit for the project for the use of hazardous substances | | | | Appropriate spill kits are available for use |
| The responsible operator must have the required training to make use of the spill kit in emergency situations; | | Provide training on the use of spill kits to the relevant employees | Pre-construction | | Once, and as and when required | Proof of training provided to the operator |
| An appropriate number of spill kits must be available and must be located in all areas where activities are being undertaken; | | Provide an appropriate number of spill kits in relevant areas | Construction | ECO | Weekly | Proof of appropriate number of spill kits in appropriate |

| **Impact management outcome:** Safe storage, handling, use and disposal of hazardous substances. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | | areas to be provided by the contractor |
| In the event of a spill, contaminated soil must be collected in containers and stored in a central location and disposed of according to the National Environmental Management: Waste Act 59 of 2008. Refer to ***Section 5.7*** for procedures concerning ***storm and waste water management*** and **5.*8*** for ***solid and hazardous waste management.*** | | Storage and disposal of contaminated soil must be in accordance with the National Environmental Management: Waste Act and sections 5.7 and 5.8 of this EMPr | | | In the event of a spill | Proof of storage and disposal in terms of the National Environmental Management: Waste Act must be provided. Certificates of disposal at licensed waste disposal facilities must be provided |

### 5.18. Workshop, equipment maintenance and storage

**Impact management outcome:** Soil, surface water and groundwater contamination is minimised.

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|---|---|---|---|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| Where possible and practical all maintenance of vehicles and equipment must take place in the workshop area; | Contractor & cEO | Demarcate specific areas for the maintenance of vehicles and equipment | Construction | ECO | Monthly | A dedicated area for the maintenance of vehicles and machinery is used. |
| During servicing of vehicles or equipment, especially where emergency repairs are effected outside the workshop area, a suitable drip tray must be used to prevent spills onto the soil. The relevant local authority must be made aware of a fire as soon as it starts; | | Ensure that a drip tray is available for an emergency repairs required | | | Continuous | Contractor to provide evidence of drip tray use for emergency repairs |
| Leaking equipment must be repaired immediately or be removed from site to facilitate repair; | | Ensure that where leaking equipment is identified it is repaired immediately or removed from site for repairs | | | In the event that equipment requires repair | Contractor to provide details of equipment repaired or removed from site |
| Workshop areas must be monitored for oil and fuel spills; | | Undertake regular inspections of the workshop areas for oil and fuel spills and keep an updated register | | | Weekly | Register of inspection |

| **Impact management outcome:** Soil, surface water and groundwater contamination is minimised. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | of inspection on site | | | | |
| Appropriately sized spill kit kept onsite relevant to the scale of the activity taking place must be available; | Contractor & cEO | Provide an Appropriately sized spill kit. | Construction | ECO | Weekly | Appropriately sized spill kits available |
| The workshop area must have a bunded concrete slab that is sloped to facilitate runoff into a collection sump or suitable oil / water separator where maintenance work on vehicles and equipment can be performed; | | Ensure that the workshop area is sufficiently bunded in accordance with the required specification | | | Once during the construction phase | Workshop area is bunded in accordance with the required specification |
| Water drainage from the workshop must be contained and managed in accordance Section ***5.7: Storm and waste water management***. | | Ensure that water drainage from workshop area is managed as per the requirements of section 5.7 | | | Monthly | Workshop drainage is managed in accordance with the requirements |

**5.19. Batching plants**

| **Impact management outcome:** Minimise spillages and contamination of soil, surface water and groundwater**.** | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| Concrete mixing must be carried out on an impermeable surface; | Contractor | Provide impermeable surface for concrete mixing | Construction | ECO | Weekly | No concrete mixing undertaken on open ground |
| Batching plants areas must be fitted with a containment facility for the collection of cement laden water. | | Fit batching plant areas with a containment facility | | | | Batching plants fitted with a containment facility |
| Dirty water from the batching plant must be contained to prevent soil and groundwater contamination | | Contain dirty water from the batching plant | | | | Dirty water from the batching plant is contained |
| Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains; | Contractor & cEO | Demarcate and provide a storage area for bagged cement in-line with the listed requirements | | | | Photographic proof of bagged cement stored within the demarcated area |
| A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted; | Contractor | Provide a washout facility for the washing of associated equipment. Enforce limitations on | | | | No cement laden water is released into the environment. Only minimal water is used |

| **Impact management outcome:** Minimise spillages and contamination of soil, surface water and groundwater. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | water use for washing of equipment | | | | for washing |
| Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licenced disposal facility; | | Make use of hardened concrete where possible or dispose of concrete in a suitable manner | | | Monthly | Certificates of disposal of concrete at licensed waste disposal facility |
| Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site; | Contractor | Bind empty cement bags and temporarily store it in an appropriate area on site | Construction | | | Proof of binding of empty cement bags and storage in an appropriate are on site to be provided by the Contractor |
| Sand and aggregates containing cement must be kept damp to prevent the generation of dust (Refer to ***Section 5.20: Dust emissions***) | | Ensure that sand and aggregates are kept damp or otherwise protected from dust generation | | | | Proof of damping (or alternative dust suppression) of sand and aggregates |
| Any excess sand, stone and cement must be removed or reused from site on completion of construction period and | | Ensure that all excess sand, stone and | | ECO | Upon completion of | Certificates for the disposal of |

| **Impact management outcome:** Minimise spillages and contamination of soil, surface water and groundwater. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| disposed at a registered disposal facility; | | cement is removed or reused | | | construction | sand, stone and cement at licensed waste disposal facilities or proof of reuse must be provided |
| Temporary fencing must be erected around batching plants in accordance with Section ***5.5: Fencing and gate installation***. | Contractor | Erect temporary fencing around the batching plant in accordance with Section 5.5 | Construction | ECO | Weekly | Temporary fencing around the batching plant in accordance with Section 5.5 |

**5.20. Dust emissions**

| **Impact management outcome:** Dust prevention measures are applied to minimise the generation of dust. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO; | Contractor | Implement dust suppression | Construction | ECO | Weekly | Dust Management Method Statement<br><br>Visual observations / photographic evidence of dust suppression |
| Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces must be re-vegetated or stabilised as soon as is practically possible; | Contractor, cEO & dEO | Proper planning for vegetation removal must be undertaken as well as for the associated rehabilitation | Pre-Construction & Construction | | Prior to construction and weekly during construction | Plan for implementation from Contractor<br><br>Implementation of plan |
| Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present; | Contractor | Ensure that specific limitations are placed on the transport and handling of erodible materials during high wind conditions or when a visible dust plume is present | Construction | | Continuous | No complaints submitted |
| During high wind conditions, the ECO must evaluate the situation and make recommendations as to whether dust- damping | ECO | ECO to provide adequate | Construction | dEO | When required | Recommendations from the ECO |

| **Impact management outcome:** Dust prevention measures are applied to minimise the generation of dust. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| measures are adequate, or whether working will cease altogether until the wind speed drops to an acceptable level; | | recommendation | | | | |
| Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind | Contractors & cEO | Place soil stockpiles in areas less affected by wind | | ECO | Weekly | Soil stockpiles are not exposed to wind and have not been eroded |
| Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO; | Contractor & cEO in consultation with the ECO | Contractor to implement erosion control measures as recommended and agreed with the ECO | | | When erosion present | Recommendations made by the ECO have been implemented by the Contractor |
| Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non- vegetated areas; | Contractor & cEO | Inform all drivers of speed limits and place appropriate signage along the relevant roads | | | Monthly | No complaints from community members are submitted |
| Straw stabilisation must be applied at a rate of one bale/10 m² and harrowed into the top 100 mm of top material, for all completed earthworks; | Contractor | Ensure that straw stabilisation is undertaken as per the listed requirements | | | | Photographic record of all straw stabilisation undertaken |
| For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread of dust. | | Appropriate dust suppression | | | Weekly | Photographic record of measures being implemented |

### 5.21. Blasting

| **Impact management outcome:** Impact to the environment is minimised through a safe blasting practice. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| Any blasting activity must be conducted by a suitably licensed blasting contractor; and | N/A | | | | | |
| Notification of surrounding landowners, emergency services site personnel of blasting activity 24 hours prior to such activity taking place on Site. | N/A | | | | | |

**5.22. Noise**

| **Impact Management outcome:** Prevent unnecessary noise to the environment by ensuring that noise from development activity is mitigated. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| The Contractor must keep noise level within acceptable limits, Restrict the use of sound amplification equipment for communication and emergency only; | Contractor | Ensure that noise limits do not exceed acceptable limits and avoid the use of amplification for communication | Construction | ECO | Monthly | No complaints registered in this regard. No amplification equipment is used. |
| All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained; | Contractor & cEO | Provide and implement silencing technology | | | | No complaints registered in this regard. Silencing technology is used. |
| Any complaints received by the Contractor regarding noise must be recorded and communicated. Where possible or applicable, provide transport to and from the site on a daily basis for construction workers; | cEO | Update complaints register.<br><br>Provide daily transport to and from site for employees | | | | Complaints register and proof of transportation services provided |
| Develop a Code of Conduct for the construction phase in terms of behaviour of construction staff. Operating hours as determined by the environmental authorisation are adhered to during the development phase. Where not defined, it must be ensured that development activities must still meet the impact management | Contractor & cEO | Compile a Code of Conduct for staff. Appropriate operating hours must be | Pre-Construction | | Prior to construction commencement and monthly | No complaints registered in this regard. |

| **Impact Management outcome:** Prevent unnecessary noise to the environment by ensuring that noise from development activity is mitigated. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| outcome related to noise management. | | identified for the project. | | | during construction | |

**5.23. Fire prevention**

| **Impact management outcome:** Prevention of uncontrollable fires. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| Designate smoking areas where the fire hazard could be regarded as insignificant; | Contractor & cEO | Identify and demarcate designated smoking areas with signage | Pre-construction & Construction | ECO | Monthly | Photographic evidence of designated smoking area |
| Firefighting equipment must be available on all vehicles located on site; | cEO / dEO in consultation with the Contractor | Provide all vehicles with firefighting equipment | Construction | | | All vehicles are fitted with firefighting equipment and the details thereof are provided |
| The local Fire Protection Agency (FPA) must be informed of construction activities; | DPM, Contractor in consultation with the cEO | Formally consult with the local FPA about the associated construction activities | Pre-construction | | Once, during the commencement of the Construction Phase | Proof of consultation with the FPA |
| Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site; | dEO / cEO / Contractor in consultation with the ECO | Develop environmental awareness training material which covers the contact numbers for the FPA and emergency services. Place the contact numbers for the FPA and | Pre-construction & Construction | | Prior to the commencement of the environmental awareness training and once during the construction phase | Environmental awareness training material and photographic evidence of contact numbers on display |

| **Impact management outcome:** Prevention of uncontrollable fires. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | emergency services at a visible and central location | | | | |
| Two way swop of contact details between ECO and FPA. | ECO | Consultation between the ECO and FPA to exchange contact details | Pre-construction | DPM | Pre-construction | Proof of consultation between ECO & FPA |

### 5.24. Stockpiling and stockpile areas

| **Impact management outcome:** Reduce erosion and sedimentation as a result of stockpiling. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| All material that is excavated during the project development phase (either during piling (if required) or earthworks) must be stored appropriately on site in order to minimise impacts to watercourses, watercourses and water bodies; | Contractor & cEO | Identify and demarcate an appropriate location for the storage of excavated materials | Pre-construction & Construction | ECO | Monthly | Excavated material is not stored within sensitive environmental areas |
| All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods; | | Implement appropriate and sufficient maintenance on stockpiled material regularly | Construction | | Every second month | Stockpiled material is maintained sufficiently and is clear of weeds and |

| **Impact management outcome:** Reduce erosion and sedimentation as a result of stockpiling. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | | alien vegetation |
| Topsoil stockpiles must not exceed 2 m in height; | | Enforce limitations for the height of topsoil stockpiles | | | Weekly | Photographic evidence that topsoil stockpiles do not exceed 2m in height |
| During periods of strong winds and heavy rain, the stockpiles must be covered with appropriate material (e.g. cloth, tarpaulin etc.); | Contractor & cEO | Appropriate material must be provided in order to cover stockpiles when required | Construction | ECO | Monthly | Contractor to provide proof of availability of appropriate material<br><br>Proof of cover during these periods should be provided |
| Where possible, sandbags (or similar) must be placed at the bases of the stockpiled material in order to prevent erosion of the material. | | Sandbags must be provided in order to prevent erosion of stockpiled materials | | | | Contractor to provide proof of availability of sandbags to prevent erosion of stockpiled materials<br><br>Proof of sandbag |

| **Impact management outcome:** Reduce erosion and sedimentation as a result of stockpiling. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | | placement where necessary |

**5.25. Civil works**

| **Impact management outcome:** Impact to the environment minimised during civil works to create the substation terrace. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| Where terracing is required, topsoil must be collected and retained for the purpose of re-use later to rehabilitate disturbed areas not covered by yard stone; | Contractor | Collect and retain topsoil for terracing | Construction & Rehabilitation | ECO | Weekly | Proof of collection and retention of topsoil |
| Areas to be rehabilitated include terrace embankments and areas outside the high voltage yards; | Contractor | Undertake rehabilitation of the required areas where applicable | Rehabilitation | ECO | Weekly | Photographic record of rehabilitation of the required areas where applicable |
| Where required, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled; | | Stabilise disturbed slope areas | Construction & Rehabilitation | | | Disturbed slope areas are stabilised |
| These areas can be stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly; | | Stabilise slopes as per design specifications | | | | Slopes stabilised as per design specifications |

| **Impact management outcome:** Impact to the environment minimised during civil works to create the substation terrace. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| Rehabilitation of the disturbed areas must be managed in accordance with ***Section 5.35: Landscaping and rehabilitation***; | | Undertaken rehabilitation of disturbed areas in accordance with Section 5.35. | Rehabilitation | | | Rehabilitation in accordance with Section 5.35. |
| All excess spoil generated during terracing activities must be disposed of in an appropriate manner and at a recognised landfill site; and | | Dispose of excess spoil at a recognised landfill site | Construction | | | Certificates for disposal of excess spoil at a licensed waste disposal facility |
| Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes. | | Spoil used for landscaping must be applied as per the requirements | Construction & Rehabilitation | | | Photographic record of spoil used for landscaping |

### 5.26. Excavation of foundation, cable trenching and drainage systems

| **Impact management outcome:** No environmental degradation occurs as a result of excavation of foundation, cable trenching and drainage systems. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |

| **Impact management outcome:** No environmental degradation occurs as a result of excavation of foundation, cable trenching and drainage systems. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| All excess spoil generated during foundation excavation must be disposed of in an appropriate manner and at a licensed landfill site, if not used for backfilling purposes; | Contractor | Use a licensed waste disposal facility for the disposal of excess spoil where required | Construction | ECO | Monthly | Certificates obtained for the disposal of excess spoil at a licensed waste disposal facility |
| Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes; | Contractor 7 cEO | Spoil used for landscaping must be applied as per the listed requirements | Construction rehabilitation | ECO | Monthly | Photographic record of spoil used for landscaping purposes |
| Management of equipment for excavation purposes must be undertaken in accordance with ***Section 5.18: Workshop, equipment maintenance and storage***; and | | Undertake the management of equipment for excavation as per the requirements of section 5.18 | Construction | | | Management of equipment is undertaken in line with the requirements of section 5.18 |
| Hazardous substances spills from equipment must be managed in accordance with ***Section 5.17: Hazardous substances***. | | Undertake the management of hazardous substances spills from equipment as per the requirements of section 5.17 | | | | Management of hazardous substances spills from equipment is undertaken in line with the requirements of section |

| **Impact management outcome:** No environmental degradation occurs as a result of excavation of foundation, cable trenching and drainage systems. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | | 5.17 |

**5.27. Installation of foundations, cable trenching and drainage systems**

| **Impact management outcome:** No environmental degradation occurs during the installation of foundation, cable trenching and drainage system. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| Batching of cement to be undertaken in accordance with **Section *5.19: Batching plants***; and | Contractor | Undertake the batching of cement as per the requirements of section 5.19 | Construction | ECO | Weekly | Management of batching cement is undertaken in line with the requirements of section 5.19 |
| Residual solid waste must be disposed of in accordance with **Section *5.8: Solid waste and hazardous management*** | Contractor | Undertake the disposal of solid waste as per the requirements of section 5.8 | Construction | ECO | Monthly | The disposal of solid waste is undertaken in line with section 5.8 |

**5.28. Installation of equipment (circuit breakers, current Transformers, Isolators, Insulators, surge arresters, voltage transformers, earth switches)**

**Impact management outcome:** No environmental degradation occurs as a result of installation of equipment.

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|---|---|---|---|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of Compliance |
| Management of dust must be conducted in accordance with Section ***5. 20: Dust emissions***; | Contractor & cEO | Manage dust as per the requirements of section5.20 | Construction | ECO | Monthly | The management of dust is undertaken as per the requirements of section 5.20 |
| Management of equipment used for installation must be conducted in accordance with Section **5*.18: Workshop, equipment maintenance and storage***; | | Management of equipment for installation meets the requirements of section 5.18 | | | | Management of hazardous substances and associated spills meets the requirements of section 5.17 |
| Management hazardous substances and any associated spills must be conducted in accordance with Section ***5.17: Hazardous substances***; and | | Management of hazardous substances and associated spills meets the requirements of section 5.17 | | | | Management of hazardous substances and associated spills meets the requirements of section 5.17 |
| Residual solid waste must be recycled or disposed of in accordance with ***Section 5.8: Solid waste and hazardous*** | Contractor & cEO | Undertake the recycling or | Construction | ECO | Monthly | The recycling or disposal of |

| **Impact management outcome:** No environmental degradation occurs as a result of installation of equipment. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of Compliance |
| ***management*** | | disposal of residual solid waste as per the requirements of section 5.8 | | | | residual solid waste is undertaken in line with section 5.8 |

### 5.29. Steelwork Assembly and Erection

| **Impact management outcome:** No environmental degradation occurs as a result of steelwork assembly and erection. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of Compliance |
| During assembly, care must be taken to ensure that no wasted/unused materials are left on site e.g. bolts and nuts | Contractor & cEO | Inspect areas where construction is being undertaken and remove and appropriately dispose of wasted/unused materials | Construction | ECO | Weekly | Contractor to provide proof of inspection and removal of waste/unused materials and the appropriate disposal thereof (i.e., disposal certificates) |
| Emergency repairs due to breakages of equipment must be managed in accordance with ***Section 5. 18: Workshop, equipment maintenance and storage*** and ***Section 5.16: Emergency procedures*** | Contractor | Execute emergency repairs of equipment as per the requirements of section 5.18 and 5.16 | Construction | | | Emergency repairs of equipment are executed as per the requirements of section 5.18 and 5.16 |

**5.30. Cabling and Stringing**

| **Impact management outcome:** No environmental degradation occurs as a result of stringing. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of Compliance |
| Residual solid waste (off cuts etc.) shall be recycled or disposed of in accordance with **Section *6.8: Solid waste and hazardous Management***; | Contractor & cEO | Undertake the recycling or disposal of residual solid waste as per the requirements of section 6.8 | Construction | ECO | Monthly | The recycling or disposal of residual solid waste is undertaken in line with section 6.8. |
| Management of equipment used for installation shall be conducted in accordance with **Section 5*.18: Workshop, equipment maintenance and storage***; | | Undertake the management of equipment for installation as per the requirements of section 5.18 | | | | Management of equipment for installation is undertaken in line with the requirements of section 5.18 |
| Management hazardous substances and any associated spills shall be conducted in accordance with ***Section 5.17: Hazardous substances***. | | Undertake the management of hazardous substances and associated spills as per the requirements of section 5.17 | | | | Management of hazardous substances and associated spills is undertaken in line with the requirements of section 5.17 |

### 5.31. Testing and Commissioning (all equipment testing, earthing system, system integration)

| **Impact management outcome:** No environmental degradation occurs as a result of Testing and Commissioning. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of Compliance |
| Residual solid waste must be recycled or disposed of in accordance with ***Section 5.8: Solid waste and hazardous management***. | Contractor & cEO | Undertake the recycling or disposal of residual solid waste as per the requirements of section 5.8 | Construction | ECO | Monthly | The recycling or disposal of residual solid waste is undertaken in line with section 5.8 |

### 5.32. Socio-economic

| **Impact management outcome:** enhanced socio-economic development | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| Develop and implement communication strategies to facilitate public participation; | dEO / cEO in consultation with Contractor and DPM | Identify and implement appropriate strategies for communication with the communities through consideration of the community's needs | Pre-construction & Construction | ECO | Once, prior to the commencement of construction and monthly during the construction | Communication is undertaken as per the identified strategies and no complaints are submitted regarding communication |
| Develop and implement a collaborative and constructive approach to conflict resolution as part of the external stakeholder engagement process; | dEO & DPM | Development and implement a Grievance | | | | Conflict resolution is undertaken in |

| **Impact management outcome:** enhanced socio-economic development | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | Mechanism which considers the community's needs and provides procedures for conflict resolution | | | | line with the requirements of the Grievance Mechanism.<br><br>No complaints on conflict resolution are submitted by the community |
| Sustain continuous communication and liaison with neighbouring owners and residents | dEO | Implement appropriate strategies for communication and Grievance Mechanism | Construction | ECO | Once, prior to the commencement of construction and monthly during the construction phase | Communication / liaison with neighbouring landowners and residents are undertaken in line with the requirements of the Grievance Mechanism.<br><br>No complaints on communication with neighbouring landowners and residents. |
| Create work and training opportunities for local stakeholders; and | Contractor & DPM | Develop and implement a "locals first" policy for the | | | | The "locals first" policy is considered in terms of the |

| **Impact management outcome:** enhanced socio-economic development | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | provision of employment opportunities | | | | employment and training opportunities |
| Where feasible, no workers, with the exception of security personnel, must be permitted to stay over-night on the site. This would reduce the risk to local farmers. | Contractor | No workers other than security personnel are permitted to stay over-night | Construction | ECO | Monthly during the construction phase | No workers other than security personnel are present on the site overnight. |

### 5.33. Temporary closure of site

| **Impact management outcome:** Minimise the risk of environmental impact during periods of site closure greater than five days. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| Bunds must be emptied (where applicable) and need to be undertaken in accordance with the impact management actions included in ***sections 5.17: Hazardous substances and 5.18: Workshop, equipment maintenance and storage***; | Contractor & cEO | Bunds must be emptied regularly. This must be undertaken as per the requirements listed in sections 5.17 and 5.18 | Construction | ECO | Prior to site closure for more than 05 days | Bunds are emptied as per the requirements listed under sections 5.17 and 5.18 |
| Hazardous storage areas must be well ventilated; | | Install appropriate ventilation in all hazardous | | | | Effective ventilation is installed in hazardous |

| **Impact management outcome:** Minimise the risk of environmental impact during periods of site closure greater than five days. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | storage areas | | | | storage areas |
| Fire extinguishers must be serviced and accessible. Service records to be filed and audited at last service; | | Ensure fire extinguishers are serviced, as required and are easily accessible with appropriate signage indicating location. Ensure service records are kept up to date and filed | | | | Photographic evidence of signage placed indicating location of fire extinguishers and service records |
| Emergency and contact details displayed must be displayed; | Contractor / cEO | Place emergency and contact details which are readily available and easily accessible | Construction | ECO | Prior to site closure for more than 05 days | Photographic evidence of contact details on display |
| Security personnel must be briefed and have the facilities to contact or be contacted by relevant management and emergency personnel; | Contractor | Hold a workshop with all security personnel to provide a brief of the project and security requirements. | | | | Proof of the workshop held must be kept on file by the contractor. |

| **Impact management outcome:** Minimise the risk of environmental impact during periods of site closure greater than five days. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | Provide facilities in order to contact management and emergency personnel | | | | |
| Night hazards such as reflectors, lighting, traffic signage etc. must have been checked; | | Regular checks of night hazards must be undertaken | | | | Proof of checks of night hazards must be provided by the contractor |
| Fire hazards identified and the local authority must have been notified of any potential threats e.g. large brush stockpiles, fuels etc.; | cEO / Contractor in consultation with the DPM / dEO | Identify any potential fire hazards and notify the relevant local authority | | | | Proof of notification of the fire hazards to the local authority must be provided by the Contractor / cEO |
| Structures vulnerable to high winds must be secured; | Contractor | Ensure structures vulnerable to wind are secure prior to site closure | Construction | ECO | Prior to site closure for more than 05 days | Structures vulnerable to wind are secured prior to site closure |
| Wind and dust mitigation must be implemented; | Contractor & cEO | Implement wind and dust | | | | Wind and dust |

| **Impact management outcome:** Minimise the risk of environmental impact during periods of site closure greater than five days. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | mitigation prior to site closure | | | | mitigation is implemented prior to site closure |
| Cement and materials stores must have been secured; | | Ensure cement and material stores are secured prior to site closure | | | | Cement and material stores are secured prior to site closure |
| Toilets must have been emptied and secured; | | Ensure toilets are emptied and secured prior to site closure | | | | Toilets are emptied and secured prior to site closure |
| Refuse bins must have been emptied and secured; | Contractor | Ensure refuse bins are emptied and secured prior to site closure | | | | Refuse bins are emptied and secured prior to site closure |
| Drip trays must have been emptied and secured. | | Ensure drip trays are emptied and secured prior to site closure | | | | Drip trays are emptied and secured prior to site closure |

**5.34. Dismantling of old equipment**

| **Impact management outcome:** Impact to the environment to be minimised during the dismantling, storage and disposal of old equipment commissioning | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of Compliance |
| All old equipment removed during the project must be stored in such a way as to prevent pollution of the environment; | Contractor, cEO | Store old equipment appropriately in a manner which prevent pollution to the environment | Decommissioning | ECO | Monthly | Photographic record |
| Oil containing equipment must be stored to prevent leaking or be stored on drip trays; | | Appropriately store equipment containing oil to prevent leaking through use of drip trays or other methods | | | | |
| All scrap steel must be stacked neatly and any disused and broken insulators must be stored in containers; | | Appropriate stacking of scrap steel and storing of any disused or broken insulators in appropriate containers | | | | |
| Once material has been scrapped and the contract has been placed for removal, the disposal Contractor must ensure that any equipment containing pollution causing substances is dismantled and transported in such a way as to prevent spillage and pollution of the environment; | | Developing and implementing procedures for dismantling and transportation of equipment containing pollution causing substances | | | | Proof from contractor that dismantling and transportation of equipment containing pollution |

| **Impact management outcome:** Impact to the environment to be minimised during the dismantling, storage and disposal of old equipment commissioning | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of Compliance |
| | | | | | | causing substances has been undertaken in an appropriate manner |
| The Contractor must also be equipped to contain and clean up any pollution causing spills; and | | Ensure sufficient spill kits are available for the clen up of pollution causing spills | | | | Sufficient spill kits available on site |
| Disposal of unusable material must be at a licensed waste disposal site. | | Make use of a licensed waste disposal site | | | | Disposal certificates for disposal at licensed landfill |

### 5.35. Landscaping and rehabilitation

| **Impact management outcome:** Areas disturbed during the development phase are returned to a state that approximates the original condition. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of Implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| All areas disturbed by construction activities must be subject to landscaping and rehabilitation; All spoil and waste must be disposed of to a registered waste site; | Contractor & cEO | Implement the Rehabilitation Plan.<br><br>Dispose of all | Rehabilitation | ECO | Weekly | Rehabilitation undertaken as per Rehabilitation Plan. |

| **Impact management outcome:** Areas disturbed during the development phase are returned to a state that approximates the original condition. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of Implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | spoil and waste at a licensed waste disposal facility. | | | | Waste disposal certificates. |
| All slopes must be assessed for contouring, and to contour only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983 | Contractor & cEO | Assess all slopes | Rehabilitation | ECO | Weekly | All slopes assessed and contoured as required |
| All slopes must be assessed for terracing, and to terrace only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983; | | | | | | All slopes assessed and terraced as required |
| Berms that have been created must have a slope of 1:4 and be replanted with indigenous species and grasses that approximates the original condition; | | Ensure berms have a slope of 1:4.<br><br>Replant berms with indigenous species | | | | All berms have a slope of 1:4 and are replanted with indigenous species |
| Where new access roads have crossed cultivated farmlands, that lands must be rehabilitated by ripping which must be agreed to by the holder of the EA and the landowners; | DPM, Contractor & cEO/dEO | Ensure that lands are rehabilitated by ripping which must be agreed to by the holder of the EA and the landowners | | | | Written permission from landowners<br><br>Ripping of land evident |
| Rehabilitation of access roads outside of farmland; | N/A | | | | | |

| **Impact management outcome:** Areas disturbed during the development phase are returned to a state that approximates the original condition. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of Implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| Indigenous species must be used for with species and/grasses to where it compliments or approximates the original condition; | Contractor & cEO | Use indigenous species for rehabilitation | Rehabilitation | ECO | Weekly | Indigenous species used for rehabilitation |
| Stockpiled topsoil must be used for rehabilitation (refer to ***Section 5.24: Stockpiling and stockpiled areas***); | Contractor | Stockpiled topsoil used as per the requirements under section 5.24. | | | | Stockpiled topsoil used as required. |
| Stockpiled topsoil must be evenly spread so as to facilitate seeding and minimise loss of soil due to erosion; | Contractor | Evenly spread topsoil | Rehabilitation | ECO | Weekly | Topsoil is spread evenly |
| Before placing topsoil, all visible weeds from the placement area and from the topsoil must be removed; | | Remove weeds from placement area and topsoil | | | | Weeds not visible in placement area and topsoil |
| Subsoil must be ripped before topsoil is placed; | | Rip soil before topsoil placed | | | | Soil ripped prior to topsoil placement |
| The rehabilitation must be timed so that rehabilitation can take place at the optimal time for vegetation establishment; | Contractor & cEO | Plan the timeframe for rehabilitation | | | At the start of rehabilitation | Rehabilitation commences at the optimal time for vegetation establishment |
| Where impacted through construction related activity, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled; | Contractor | Stabilise all disturbed slope areas | | | Weekly | Disturbed slope areas stabilised |

| **Impact management outcome:** Areas disturbed during the development phase are returned to a state that approximates the original condition. | | | | | | |
|---|---|---|---|---|---|---|
| **Impact Management Actions** | **Implementation** | | | **Monitoring** | | |
| | Responsible person | Method of Implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| Sloped areas stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly; | | Stabilise slopes as per design specifications | | | | Slopes stabilised as per design specifications |
| Spoil can be used for backfilling or landscaping as long as it is covered by a minimum of 150 mm of topsoil. | | Apply spoil as per the requirements | | | | Photographic record of spoil used for landscaping purposed and feedback from contractor |
| Where required, re-vegetation including hydro-seeding can be enhanced using a vegetation seed mixture as described below. A mixture of seed can be used provided the mixture is carefully selected to ensure the following:<br>Annual and perennial plants are chosen;<br>Pioneer species are included;<br>Species chosen must be indigenous to the area with the seeds used coming from the area;<br>Root systems must have a binding effect on the soil;<br>The final product must not cause an ecological imbalance in the area | Contractor in consultant with suitably qualified specialist | Make use of a suitable vegetation seed mixture should enhancement be required | | | As and when required | Use of suitable vegetation seed mixture |

## 6 ACCESS TO THE GENERIC EMPr

Once completed and signed, to allow the public access to the generic EMPr, the holder of the EA must make the EMPr available to the public in accordance with the requirements of Regulation 26(h) of the EIA Regulations.

## PART B: SECTION 2

## 7 SITE SPECIFIC INFORMATION AND DECLARATION

### 7.1 Sub-section 1: contact details and description of the project

7.1.1 Details of the applicant: Name of applicant: **K2022578590 (South Africa) Proprietary Limited**

Applicant representative: **Dirk Muller**

Tel No: **+27 79 367 2593**

Fax No:

Postal Address: **2 Canal Edge, Tyger Waterfront, Bellville, Cape Town**

Physical Address: **2 Canal Edge, Tyger Waterfront, Bellville, Cape Town**

7.1.2 Details and expertise of the EAP:

Name of EAP: **Jana Minnaar (de Jager) (EAPASA: 2019-665)**

Tel No: **011 519 0394**

Fax No: **011 519 0201**

E-mail address: **jana@jaws.co.za**

Expertise of the EAP (Curriculum Vitae included in **APPENDIX 2**): 5 years

7.1.3 Project name: **Proposed up to 130MW Phula PV Facility, near Steelpoort in the Limpopo Province**

7.1.4 Description of the project:

K2022578590 (South Africa) Proprietary Limited (hereafter referred to as "AGV") is proposing to develop a Solar Photovoltaic (PV) energy facility and associated infrastructure (hereafter referred to as "Phula PV project") on the Remainder of, and Portion 2 of the farm De Grooteboom 373 KT in the Limpopo Province. The Phula PV planned generation capacity output will be up to 130 Megawatts (MW). As part of the Phula PV project, a 33kV/132kV onsite facility substation covering approximately 056 ha area is proposed. The developer has identified two (2) alternatives for the grid connection infrastructure for the proposed solar facility which will be subject to separate EA application process. The overall objective is to feed the 130 MW generated from the Phula PV facility into the national grid.

This EMPr covers the management measures for the proposed Phula PV Facility onsite substation.

7.1.5 Project location

The proposed development site is situated in close proximity to the local chrome and platinum mines near Steelpoort, 33km south-east of the town of Lydenburg. It is located on the Remainder of, and Portion 2 of the farm De Grooteboom 373 KT within Fetakgomo Tubatse Local Municipality (FTLM) in the Limpopo Province. The locality of the proposed site is presented in **Figure 7-1** and details of affected properties are provided in **Table 7-1**.

**Table 7-1: Details of affected properties**

| | |
|---|---|
| **Province** | Limpopo |
| **Local Municipality** | Fetakgomo Tubatse (Greater Tubatse) |
| **District Municipality** | Sekhukhune |
| **Nearest Town** | 33km south-east of the town of Lydenburg |
| **Physical Address** | Farm De Grooteboom 373 KT, Greater Tubatse, Steelpoort, 1133 |
| **Site Area** | approximately 249 ha and<br>0.56 ha for onsite substation |
| **Farm Name** | De Grooteboom 373 KT |
| **Portion No.** | Remainder of portion 0 |
| **Onsite Substation boundary coordinates** | 24°56'27.45"S; 30° 8'7.28"E |
| | 24°56'28.29"S; 30° 8'9.73"E |
| | 24°56'31.29"S; 30° 8'8.03"E |
| | 24°56'30.03"S; 30° 8'5.66"E |

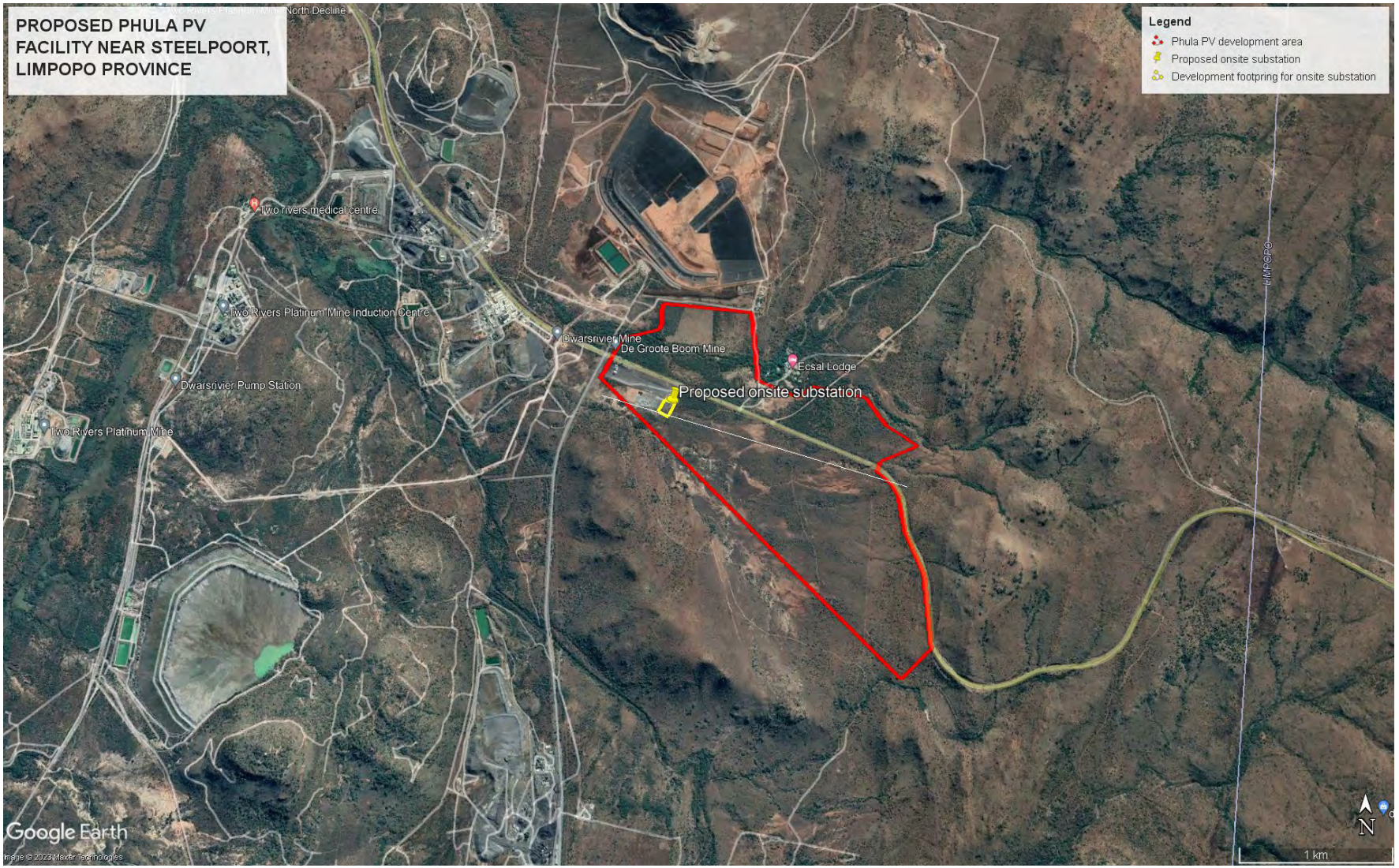


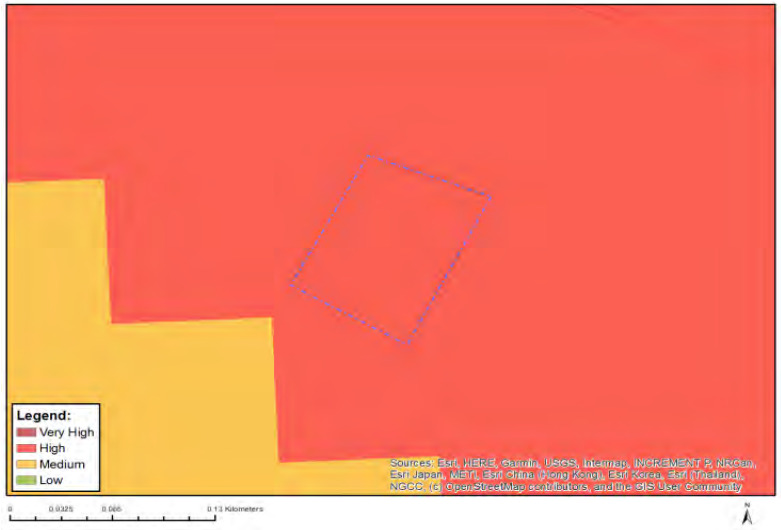
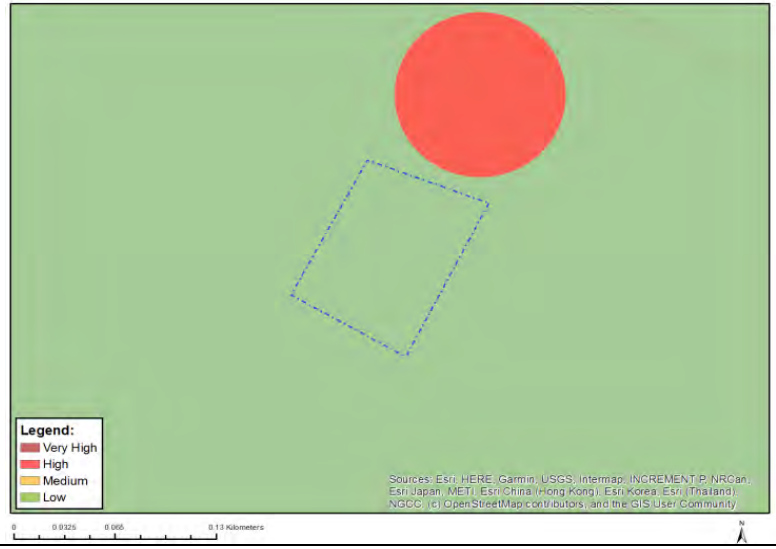

**Figure 7-1: Google imagery indicating location of proposed onsite substation in support of the Phula PV facility**

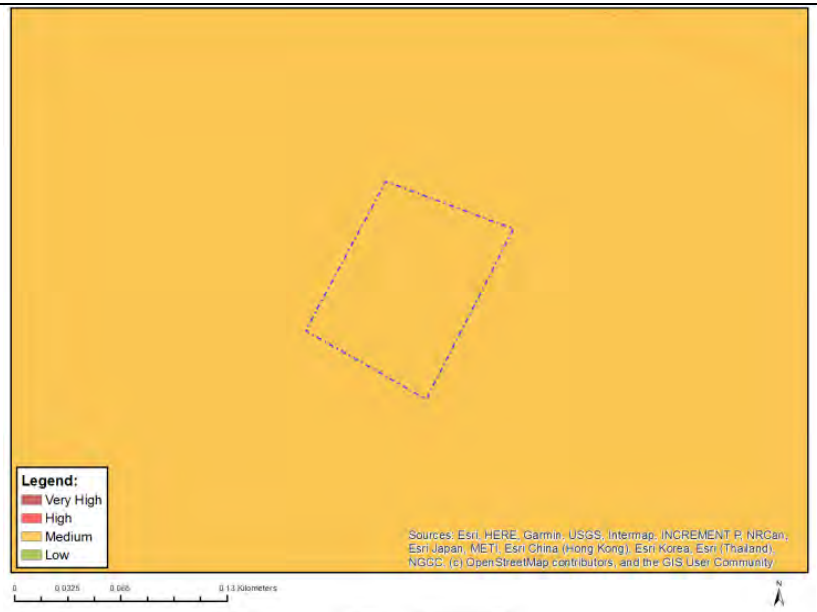
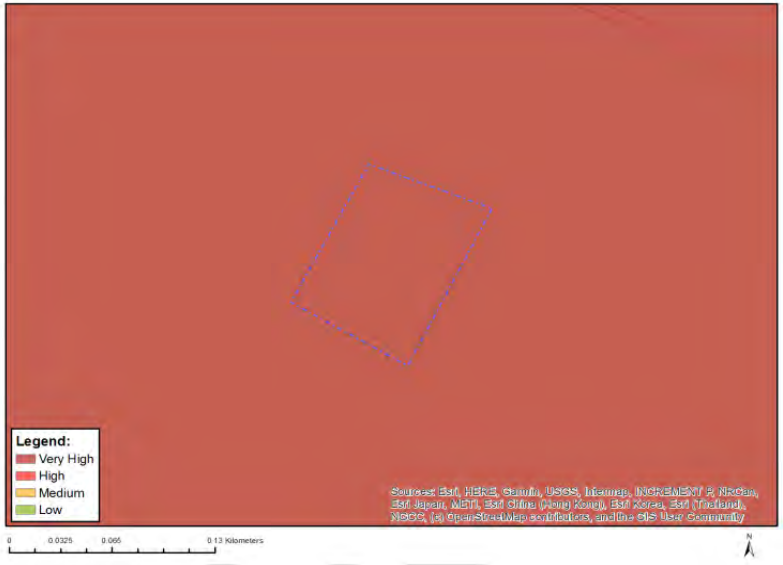
## 7.2 Sub-section 2: Development footprint site map

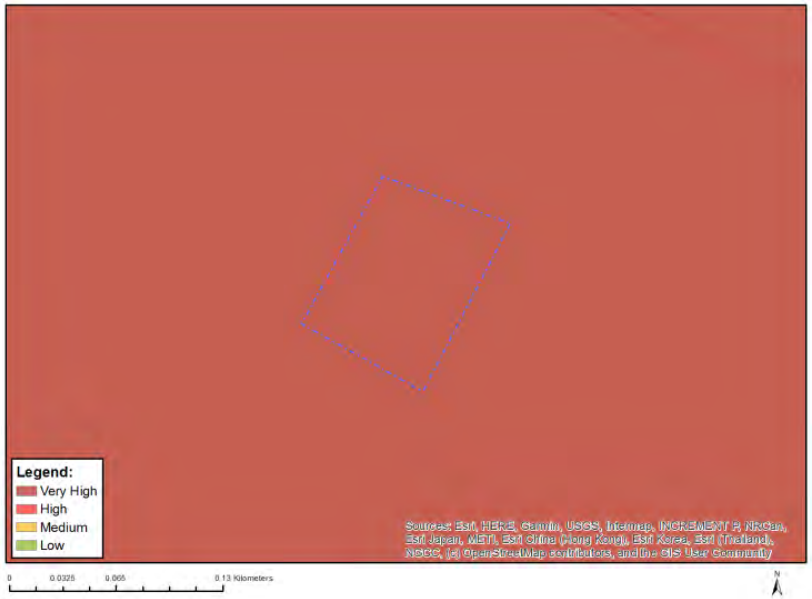
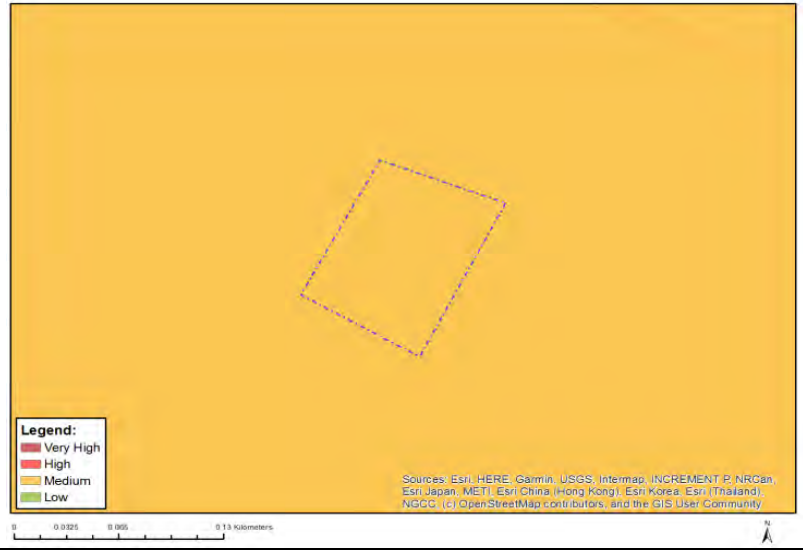
This sub-section must include a map of the site sensitivity overlaid with the preliminary infrastructure layout. The sensitivity map must be prepared from the national web based environmental screening tool, when available for compulsory use at: https://screening.environment.gov.za/screeningtool. The sensitivity map shall identify the nature of each sensitive feature e.g. threatened plant species, archaeological site, etc. Sensitivity maps shall identify features both within the planned working area and any known sensitive features within 50 m from the development footprint.

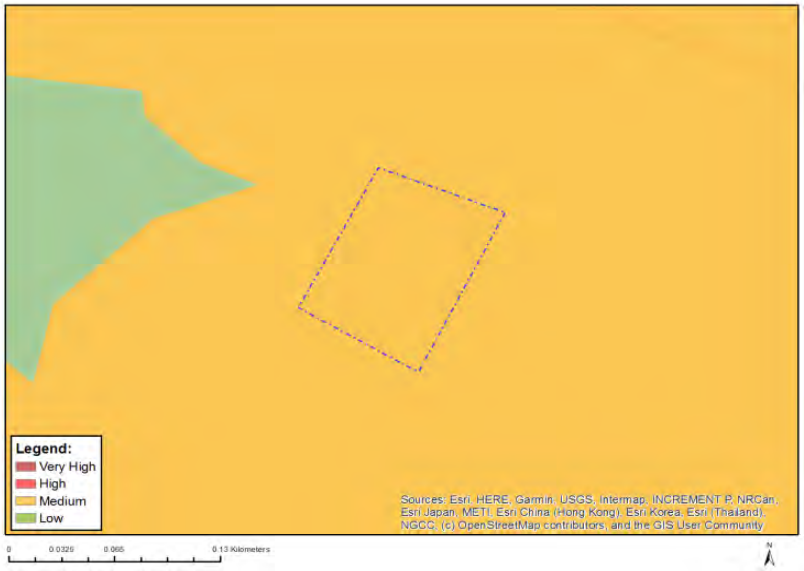
**Table 7-2** provides the outcome of the identified sensitivities in terms of the screening tool. The specialist investigations have identified various impacts on the biophysical and socio-economic environment and the environmental sensitivities identified by specialists are outline on the **Figure 7-2** below.

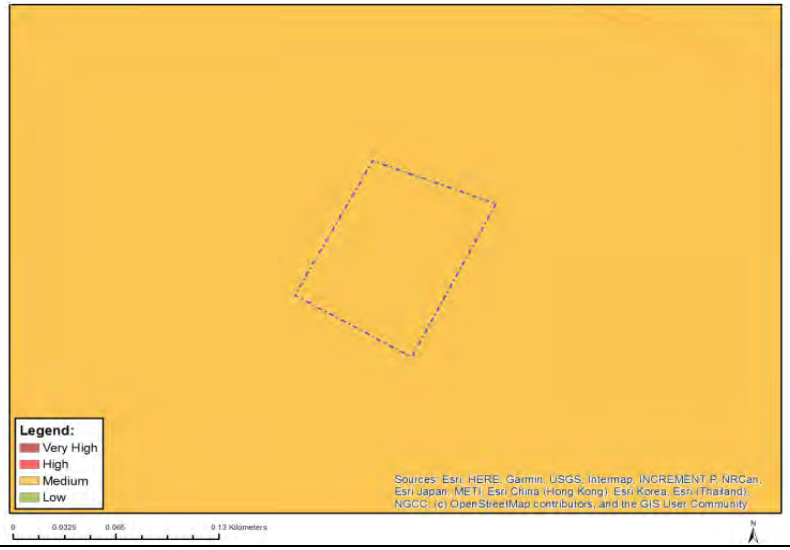
**Table 7-2: Outcome of the DFFE screening tool**

| Specialist assessment Identified | Sensitivity Rating | Sensitivity map |
|---|---|---|
| Agricultural | High Sensitivity |  |
| Archaeological | Low |  |

| | | |
|---|---|---|
| Palaeontological | Medium |  |
| Terrestrial Biodiversity | Very High |  |

| | | |
|---|---|---|
| Aquatic Biodiversity | Very High |  |
| Civil Aviation | Medium |  |

| | | |
|---|---|---|
| Defence | Low |  |
| Plant Species | Medium |  |

| | | |
|---|---|---|
| Animal Species | Medium |  |

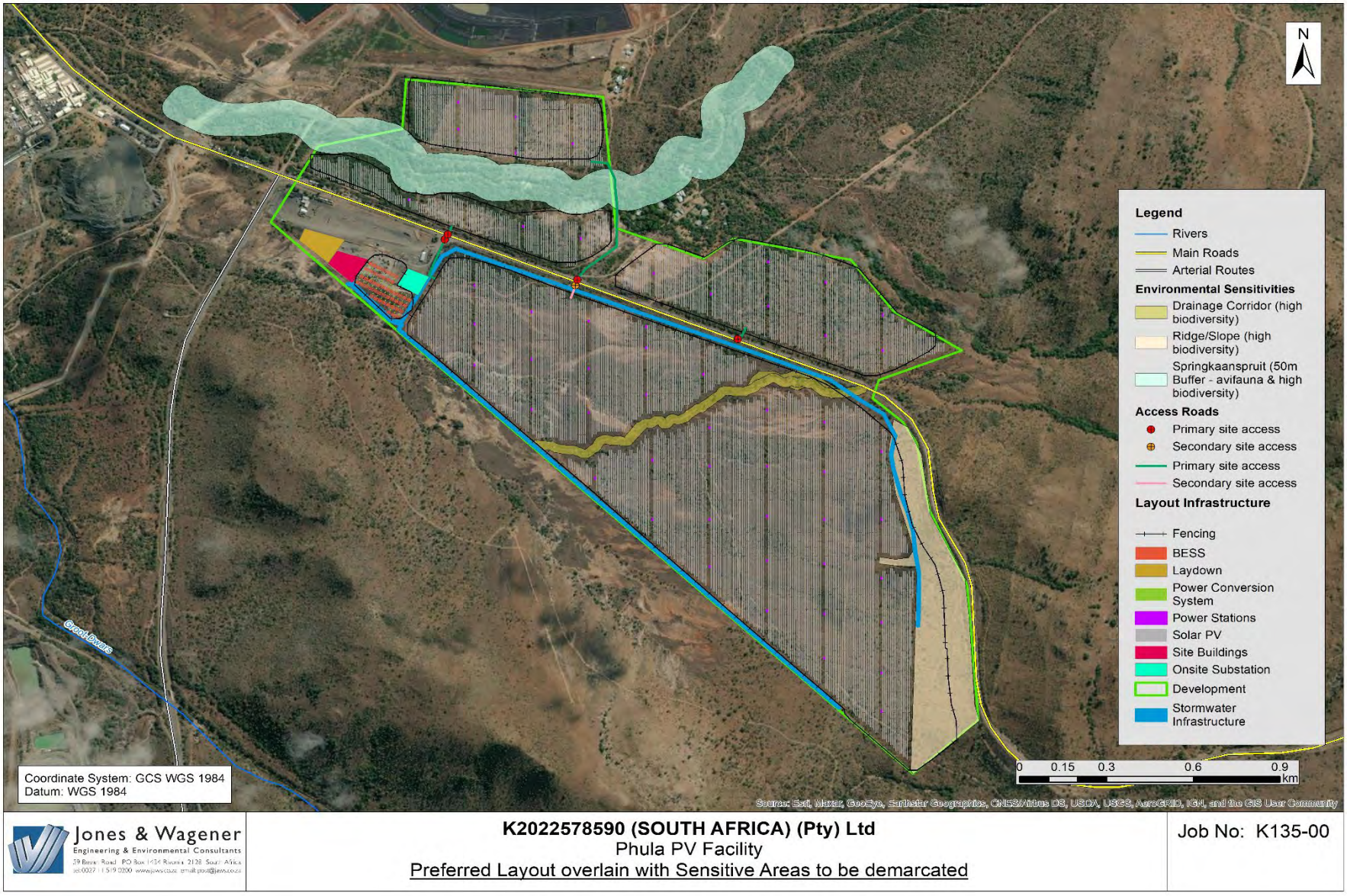



**Figure 7-2: Preferred Phula PV layout**

### 7.3 Sub-section 3: Declaration

The proponent/applicant or holder of the EA affirms that he/she will abide and comply with the prescribed impact management outcomes and impact management actions as stipulated in part B: section 1 of the generic EMPr and have the understanding that the impact management outcomes and impact management actions are legally binding. The proponent/applicant or holder of the EA affirms that he/she will provide written notice to the CA 14 day prior to the date on which the activity will commence of commencement of construction to facilitate compliance inspections.

Signature Proponent/applicant/ holder of EA Date:

---

### 7.4 Sub-section 4: amendments to site specific information (Part B; section 2)

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

**PART C**

## 8 SITE SPECIFIC ENVIRONMENTAL ATTRIBUTES

If any specific environmental sensitivities/attributes are present on the site which require more specific impact management outcomes and actions, not included in the pre-approved generic EMPr template, to manage impacts, those impact management outcomes and impact management actions must be included in this section. These specific management controls must be referenced spatially, and must include impact management outcomes and impact management actions. The management controls including impact management outcomes and impact management actions must be presented in the format of the pre-approved generic EMPr template. This applies only to additional impact management outcomes and impact management actions that are necessary.

If Part C is applicable to the development as authorised in the EA, it is required to be submitted to the CA together with the BAR or EIAR, for consideration of, and decision on, the application for EA. The information in this section must be prepared by an EAP and the name and expertise of the EAP, including the curriculum vitae are to be included. Once approved, Part C forms part of the EMPr for the site and is legally binding.

This section will **not be required** should the site contain no specific environmental sensitivities or attributes.

**APPENDIX 1: METHOD STATEMENTS**

To be prepared by the contractor prior to commencement of the activity. The method statements are **not required** to be submitted to the CA.

# APPENDIX B

## ALIEN INVASIVE MANAGEMENT PLAN

Jones & Wagener
Engineering & Environmental Consultants
59 Bevan Road PO Box 1434 Rivonia 2128 South Africa
tel: 00 27 11 519 0200 www.jaws.co.za email: post@jaws.co.za

# ALIEN PLANT AND OPEN SPACE MANAGEMENT PLAN FOR PHULA PV FACILITY

## 1. INTRODUCTION

K2022578590 (South Africa) Proprietary Limited (hereafter referred to as the Applicant) is proposing to develop a Solar Photovoltaic (PV) energy facility and associated infrastructure (hereafter referred to as "Phula PV project")[1] on the Remainder of, and Portion 2 of the farm De Grooteboom 373 KT in the Limpopo Province. The proposed project site is situated in close proximity to the local chrome and platinum mines near Steelpoort, 33 km south-east of the town of Mashishing/Lydenburg.

The development area of approximately 249 hectares (ha) was identified by The Applicant as a suitable area for the Phula PV project. The Solar PV planned generation capacity output will be up to 130 Megawatts (MW). The proposed Phula PV project is being developed with the aim of generating renewable energy to supply to the national grid under the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or similar procurement programme.

This Invasive Alien Plants (IAPs) is compiled in support of the Environmental Management Programme for the development Phula PV Facility project. The main aim is to provide a framework for the management of alien and invasive plant species during the construction and operation of the Phula PV Facility.

## 2. BACKGROUND

IAPs are plant species that disperse or are introduced, either intentionally or unintentionally, to ecosystems outside of their natural distribution. IAPs proliferate due to suitable climate, no natural enemies and their ability to outcompete native plants. IAPs pose the second largest threat to biodiversity after direct habitat destruction. Negative impacts of IAPs include surface and sub-surface water loss, decreased agricultural potential, increased risk of wildfires, reduced ecosystem services and lower land values.

There are currently over 2000 listed alien species in South Africa (Martens, *et al*., 2021), ranging from marine, estuarine, freshwater and terrestrial fish, insects and plants. Around 38% of these species are considered as invasive species with around 80 species being plants. This plan only focuses on IAPs.

## 3. PURPOSE

[1] It should be noted that the proposed project was previously referred to as the Platinum PV project. However subsequent to Approval of Scoping the Applicant was required to change the name of the proposed project due to requirements from Eskom's Grid Access Unit (GAU). A notification regarding the name change has been provided to stakeholders.

The purpose of this plan is to:

- Ensure that IAPs do not become dominant in parts of the site, particularly areas that have been largely modified, through the control of their presence, dispersal and encroachment;
- Provide guidance on the removal of existing IAPs on site;
- Develop and implement a monitoring and eradication programme for IAPs;
- Promote the natural re-establishment of native species in order to prevent future invasions.

This plan forms a part of the Environmental Management Programme (EMPr) and should be updated throughout the life cycle of the project. This plan should be implemented with specific focus on environmentally sensitive areas.

# 4. LEGISLATIVE CONTEXT

## 4.1 Conservation of Agricultural Resources Act (Act No. 43 of 1983) (CARA)

In terms of the amendments to the regulations under this Act, landowners are legally responsible for the control of invasive alien plants on their properties. The schedules provide a list of declared weeds and invaders, which have been divided into three categories, as follows:

- Category 1 plants are prohibited and must be controlled.
- Category 2 plants (commercially used plants) may be grown in demarcated areas providing that there is a permit and that steps are taken to prevent their spread.
- Category 3 plants (ornamentally used plants) may no longer be planted; existing plants may remain, as long as all reasonable steps are taken to prevent the spreading there of, except within the floodline of watercourses and wetlands.

## 4.2 National Environmental Management: Biodiversity Act, 2004 (Act No.10 of 2004) (NEM:BA)

The National Environmental Management: Biodiversity Act (NEMBA) regulates all invasive organisms in South Africa, including a wide range of fauna and flora. Regulations have been published in Government Notices R.506, R.507, R.508 and R.509 of 2013 under NEM:BA. Chapter 5 of the Act relates to species and organisms posing a potential threat to biodiversity. The purpose of Chapter 5 is:

- to prevent the unauthorized introduction and spread of alien species and invasive species to ecosystems and habitats where they do not naturally occur;
- to manage and control alien species and invasive species to prevent or minimize harm to the environment and to biodiversity in particular;
- to eradicate alien species and invasive species from ecosystems and habitats where they may harm such ecosystems or habitats.

According to this Act and associated regulations, any species belonging to the categories below cannot be propagated, grown, bought or sold without a valid permit:

- Category 1a: Invasive species requiring compulsory control. Any specimens of this category need, by law, to be eradicated from the environment. No permits will be issued.

- Category 1b: Invasive species requiring compulsory control as part of an invasive species control programme. Remove and destroy. These plants are deemed to have such a high invasive potential that infestations qualify to be placed under a government sponsored management program. No permits will be issued.
- Category 2: Invasive species regulated by area. A demarcation permit is required to import, possess, grow, breed, move, sell, buy or accept as a gift any plants listed under this category. No permits will be issued for riparian zones.
- Category 3: Invasive species regulated by activity. An individual plant permit is required to undertake any of the following restricted activities: import, possess, grow, breed, move, sell, buy or accept as a gift involving plants listed under this category. No permits will be issued for riparian zones.

It is important to note that IAPs that are regulated by CARA are exempted from NEM:BA. This implies that the provisions of CARA in respect of listed weed and invader plants supersede those of NEM:BA.

# 5. ALIEN PLANT MANAGEMENT PRINCIPLES

## 5.1 Prevention and early detection

A pro-active stance is recommended to avoid the establishment of IAPs. This includes the effective rehabilitation of disturbed sites post-construction and post-closure as well as the prevention of unnecessary disturbance to natural areas.

Monitoring plans should be developed and implemented to identify IAPs already on site or IAPs that are introduced to the site by external factors such as the movement of construction vehicles. Effective monitoring will enable early detection of IAPs which is essential in their control and eradication prior to the establishment of an ecologically viable population. Monitoring can be done by site walk-throughs and by technological mechanisms such as drones or satellite imagery. However, this is dependent on the species physiology and growth stage of the plant.

## 5.2 Containment and control

On identification of IAPs on site, action plans should be developed based on the size of the infestation, budget, manpower considerations and time. Separate action plans should be developed for each location and/or species. Appropriate control methods are discussed below. The key is to ensure that no invasions are allowed to spread and establish infestations. Effective containment and control will ensure that the least amount of resources are required to manage IAPs over the long term. This will also ensure that the impact on natural systems will be reduced.

## 5.3 Clearing and maintenance

IAP control programmes are long term projects and should consist of three phases: clearing, follow ups and maintenance. Pioneering IAP stands that are yet to establish should be cleared first to prevent the build-up of seed banks and dispersal by biophysical agents. Dense, mature stands should be cleared last as they will require the most amount of resources and have a higher risk of re-establishment once cleared. It may be necessary to develop collective management and clearing strategies with neighbouring properties as large stands of IAPs may cross boundaries and are easily dispersed by wind, water or animals. All clearing actions must be kept on record to logically plan follow ups and maintenance checks.

Different species require different clearing methods based on their physiological and genotypical structure. The clearing method used will significantly impact on the eradication success of the IAP management plan, with inappropriate clearing methods having the potential to exacerbate the problem. It must be noted that regardless of the method used, disturbance to the soil should be kept at a minimum and fire should not be used to control IAPs or vegetation on site as it poses a safety risk. There are three clearing methods used, either in tandem or isolated: Mechanical, Chemical and Biological.

### 5.3.1 Mechanical clearing

This entails damaging or removing the plant by physical action such as uprooting, felling, slashing, mowing, ringbarking or bark stripping. This control method is only feasible for sparse infestations at small scales and for species that do not coppice after cutting. Species that do coppice need to have the cut stumps or coppice growth treated with herbicides following mechanical clearing. This method is labour intensive, time consuming and expensive to undertake as well as could cause severe soil disturbance and erosion.

Mechanical control is generally dependent on the growth stage and physical structure of the plant and is summarised as follows:

- **Seedlings:** seedlings of IAPs appear frequently due to dispersal by biotic agents such as birds or abiotically by wind or water. Seedlings should be pulled out as soon as possible to eliminate the need for tree felling once the plant has been established.
- **Small plants (shrubs and small trees):** IAPs that are small or in early stages of growth can be removed using a 'Tree Popper' (*https://treepopper.co.za/*). Alternatively, upper growth can be cut off and thereafter the stem and root can be removed from the soil. It is vital that the root ball and any taproots are totally removed to prevent re-growth, as invasive plants often have roots capable of regeneration.
- **Large trees:** Trees that are too large for physical removing can be ring-barked. This technique involves stripping a ring of bark at least 25cm wide, with the bark being peeled down to ground level. Ring-barking inhibits circulation of water and nutrients and will eventually result in plant mortality. A quicker process is to fell the tree to a stump of approximately 30cm and thereafter ring-bark the stump. Any regrowth must be cut off to prevent regeneration.

**Table 5-1: Advantages and Disadvantages of Mechancial Clearing Methods**

| ADVANTAGES | DISADVANTAGES |
|---|---|
| Effective method in areas with low infestation | Not an effective method for dense infestations, as the cost of clearing is extremely high, with little or no impact |
| High job creation and associated poverty alleviation potential | Time consuming |
| No contamination of water with herbicides | If no herbicides are used then the manual control techniques must be very well executed to ensure success |

**Figure 5-1: Mechanical control of IAPs by cutting and slashing**

### 5.3.2 Chemical control

Mechanical control is usually preferable but is not always adequate, particularly for species that can re-sprout. The use of chemicals such as herbicides are an effective method for eradicating plant species that coppice or regrow after mechanical clearing. However, appropriate registered chemicals that are species-specific must be administered in accordance with the Fertilizer, Farm Feeds, Agricultural Remedies and Stock Remedies Act (Act No. 36 of 1947). This act implies that the person administering chemicals and herbicides must have a valid Pest Control Operators License attainable from the Department of Agriculture, Land Reform and Rural Development (DALRRD).

Herbicides are either classified as selective or non-selective. Selective herbicides are usually specific to a particular group of plants, e.g. those specified for use on broad leaf plants, but should not kill narrow-leaf plants such as grasses. Non-selective herbicides can kill any plant that they come into contact with and are therefore not suitable for use in areas where indigenous vegetation is present.

Chemical application techniques include foliar (leaf) application, stem applications (basal stem, total frill, stem injections) and stump applications (cut stump, total stump, scrape and paint).

Where herbicides are used, the impact on the natural environment must be minimised by observing the following:

- Careful, accurate application with the required amount of herbicide must be used to avoid contamination of unaffected areas.
- All care must be taken to prevent contamination of water courses and water bodies. This includes due care in storage, application, cleaning and disposal of containers, equipment and other required tools.
- Herbicides used must have minimal effect on indigenous plants and other non-target species.

- Coarse droplet nozzles must be fitted to avoid drift onto neighbouring vegetation.
- The appropriate health and safety procedures must be followed regarding the storage, handling, use and disposal of herbicides.
- The use of chemical control is not recommended for wetland areas where the risk of onsite and offsite contamination is high.

**Table 5-2: Advantages and disadvantages of chemical control methods**

| ADVANTAGES | DISADVANTAGES |
|---|---|
| Complements mechanical control methods, increasing the effectiveness of control activities | May kill non-target plants or species. This is a very important consideration and poses risks for remaining natural areas on site |
| Achieve results over short period (within 6 weeks of application) | Herbicides are expensive |
| Large areas can be treated quickly | The use of herbicides may contaminate sites used for drinking water and subsistence. This can result in the biological magnification of chemicals within ecosystems and affect flora and fauna, including humans. |
| | Specialised training and certification are required for use of herbicides |

Chemical control must be done in a responsible manner and is dependent on the size or growth stage of the plant. This is summarised below:

- Seedlings and small shrubs: Plants less than 2m in height can be directly sprayed on. This must be done when there is no wind to minimise spray drifting onto non-target plants. The target area to be sprayed on will be dependent on the species of IAP that one is controlling.
- Large shrubs and trees: Plants higher than 2m will require a cut-stump, basal stem or foliar spray method. The **cut-stump method** involves felling the tree while leaving a stump that is flat and as close to the ground as possible. A recommended herbicide must be applied to the stump. The **basal stem treatment** involves painting herbicide (up to 25cm above ground level) onto the base of the tree trunk and any exposed roots. In the case of multi-stemmed plants, each stem must be painted on. The aim of this method is to ensure that the herbicide enters the plant's circulatory system and kill off the plant. The **foliar spray method** is used for coppicing plants that regrow after felling. Regrowth must be allowed to reach a height of 50cm before spraying herbicide. Trees with bud banks or lignotubers can be destroyed using a herbicide after sawing off the trunk at ground level.

**Figure 5-2: Chemical control by spraying**

### 5.3.3 Biological control

Biological control, also known as biocontrol, involves the use of natural predators/pests to reduce the vigour or reproductive potential of IAPs. These pests/predators are called biocontrol agents and include insects, fungi, bacteria and mites. Biocontrol agents either feed directly on the plant (leaves, stems, roots) or on the reproductive organs (flower buds, flowers, fruit, seeds). Some agents may not feed on the plant but infect it through disease such as fungi and bacteria. The stress caused by the biological control agent may kill a plant outright or it might impact on the plants reproductive capacity. In certain instances, the reproductive capacity is reduced to zero and the population is effectively sterilized. All of these outcomes will help to reduce the spread of the species.

**Table 5-3: Advantages and disadvantages of biological control**

| ADVANTAGES | DISADVANTAGES |
|---|---|
| Most environmentally friendly and most sustainable of all control methods | Generally slow, especially initially |
| Usually does not require high or long-term maintenance | Low levels of infestation, with occasional outbreaks, will remain a feature of systems under biological control |
| Relatively low cost implication over the long term | Any use of chemicals around biocontrol agent colonies may adversely affect the potency of this control method |
| | Cannot be used where the biocontrol agent would threaten commercial populations of the target species that may exist nearby |
| | Biocontrol agents are not available for all target species |
| | Requires extensive research which is time-consuming |
| | Susceptible to future impacts of climate change |

## 5.4 Developing an IAP Management Plan


**Figure 5-3: Key steps in creating an IAP Management Plan (Martens, et al., 2021)**

An IAP Management Plan is case-specific and it is important to consider the context within which the plan is being implemented. However, the principles behind executing a simple and effective IAP Management Plan are the same.

1. A suitably qualified and experienced person should survey the areas to be cleared and identify the IAPs that occur there. Surveys should be done by site walk-downs, with satellite imagery supplementing on-the-ground observations. For large stands of IAPs, it may not be feasible to undertake site walk-downs and satellite imagery and GIS mapping may prove to be more practical.

2. Dividing the land into similar management units based on soil, slope, species, fire history, age classes and densities will make implementation easier and manageable. Using GIS tools will assist in delineating such management units.
3. Actions should be executed in a logical and effective manner taking into consideration the type of control required, the order in which they should be executed and external factors such as seasonality and fire regimes.
4. By conducting the first three steps, a cost estimate can be generated in terms of equipment and labour as well as the cost of monitoring and maintaining the IAP Maintenance Plan.

## 5.5 General guidelines to clearing IAPs

Managing IAPs is a tedious and complex task often with varying degrees of success. Therefore, it is useful to set priorities when dealing with IAPs:

- Prevent new invasions by targeting emerging or new species before they can establish.
- Areas that require follow-up treatment should be prioritised over areas that require first-time clearing. Follow-ups ensure that past efforts to control IAPs are worthwhile and warrant the time and finances invested. This also applies to areas that are fire-driven, with fire acting as an initial clearing mechanism for follow-up clearing post-administering of the burn.
- Areas in which IAPs pose a fire risk should be prioritised e.g. Near settlements, power lines, plantations. Firebreaks should be established to protect infrastructure and livelihoods.
- Always start with less dense, young stands as this will prevent the establishment of seedbanks. This is especially so for fast-growing, wind dispersed species such as hakea and pine. Established stands will require much more time and effort to eradicate and will also allow young stands to establish which will exacerbate the problem.
- Consider the topography of the area and begin control upslope. All operations should ideally follow the slope and drainage lines, moving downstream or downslope. This ensures that reproductive elements of IAPs such as seeds cannot be dispersed downstream, downslope or downwind and avoid reinfestation.
- Always work from the edge of stands inwards to contain IAPs within the current stand.
- When clearing IAPs on steep slopes, clearing should be done horizontally along the contours with cleared vegetation being stacked along contour lines to form terraces. This will arrest surface water run-off and assist with reducing soil erosion.
- Rivers, streams and wetlands (riparian zones) are priority areas when clearing IAPs as IAPs reduce flow and water quality. Watercourses also act as a pathway for IAPs to disperse their seeds and establish downstream.
- Collaboration and collective management are required for effective and efficient IAP control. Try to integrate control plans with neighbours to reduce reinfestation and lower monitoring and follow-up costs.

## 5.6 Monitoring requirements

The only way to deduce the effectiveness of the IAP Management Plan is to assess the impact of clearing activities, follow-ups and rehabilitation efforts. Monitoring is central to

analysing success and room for improvement. In general, the following monitoring principles are recommended:

- Photographic records must be kept of areas to be cleared prior to work starting and at regular intervals during initial clearing activities. Similarly, photographic records should be kept of the area from immediately before and after follow-up clearing activities. Rehabilitation processes must also be recorded.
- Simple records must be kept of daily operations, e.g. area/location cleared, labour units and, if ever used, the amount of herbicide used.
- It is important that, if monitoring results in detection of invasive alien plants, that this leads to immediate action.

Monitoring must be implemented during the following phases to ensure that the IAP management is sufficient:

### 5.6.1 Construction phase

**Table 5-4: Monitoring requirements durinng construction phase of Phula PV facility**

| MONITORING ACTION | INDICATOR | TIMEFRAME |
|---|---|---|
| Document alien invasive species present on site | Alien species present and identified | Pre-construction<br>Monthly during summer (mid-November to end March)<br>Every 3 months during winter |
| Document IAP distribution | IAP distribution map and IAP management units | Every 3 months |
| Document and record alien control measures implemented | Record of clearing activities | Every 3 months |
| Review alien control success rate | Decline in abundance of alien plant species over time | Every 3 months |

### 5.6.2 Operation phase

**Table 5-5: Monitoring requirements durinng construction phase of Phula PV facility**

| MONITORING ACTION | INDICATOR | TIMEFRAME |
|---|---|---|
| Document alien species distribution and abundance on site | IAP distribution map | Biannually |
| Document alien plant control measures implemented & success rate achieved | Records of control measures and their success rate.<br>A decline in IAP distribution and cover on site. | Biannually |

| MONITORING ACTION | INDICATOR | TIMEFRAME |
|---|---|---|
| Document rehabilitation measures implemented and success achieved in problem areas | Decline in vulnerable bare areas over time | Biannually |

## 6. CONCLUDING STATEMENT

The establishment of IAPs can be minimized, control when the necessary measures mentioned are properly implemented. Any encountered IAPs during construction and operational phase should be reported and removed, and indigenous species should be used for the rehabilitation instead of invasive plants

## 7. REFERENCES

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# APPENDIX C

## REVEGETATION AND REHABILITATION PLAN

Jones & Wagener
Engineering & Environmental Consultants
59 Bevan Road PO Box 1434 Rivonia 2128 South Africa
tel: 00 27 11 519 0200 www.jaws.co.za email: post@jaws.co.za

# REVEGETATION AND REHABILITATION PLAN FOR PHULA PV FACILITY

## 1. INTRODUCTION

K2022578590 (South Africa) Proprietary Limited (hereafter referred to as the Applicant) is proposing to develop a Solar Photovoltaic (PV) energy facility and associated infrastructure (hereafter referred to as "Phula PV project")[1] on the Remainder of, and Portion 2 of the farm De Grooteboom 373 KT in the Limpopo Province. The proposed project site is situated in close proximity to the local chrome and platinum mines near Steelpoort, 33 km south-east of the town of Mashishing/Lydenburg .

The development area of approximately 249 hectares (ha) was identified by The Applicant as a suitable area for the Phula PV project. The Solar PV planned generation capacity output will be up to 130 Megawatts (MW). The proposed Phula PV project is being developed with the aim of generating renewable energy to supply to the national grid under the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or similar procurement programme.

This revegetation and rehabilitation plan is compiled in support of the Environmental Management Programme for the development Phula PV Facility project. The main aim is to provide a framework for the management of disturbed vegetation areas during the construction and operation of the Phula PV Facility.

## 2. PURPOSE

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

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

## 3. TOPSOIL MANAGEMENT

Effective topsoil management is a critical element of rehabilitation. Where excavation or topsoil clearing is required, the topsoil should be stockpiled and later used to cover cleared

[1] It should be noted that the proposed project was previously referred to as the Platinum PV project. However subsequent to Approval of Scoping the Applicant was required to change the name of the proposed project due to requirements from Eskom's Grid Access Unit (GAU). A notification regarding the name change has been provided to stakeholders.

and disturbed areas once construction activity has ceased. The following guidelines should be adhered to with regards to topsoil management:

- Topsoil is the top-most layer (typically 0-30cm) of the soil in undisturbed areas. This soil layer is important as it contains nutrients, organic matter, seeds, micro-organisms fungi and soil fauna. All these elements are necessary for soil processes such as nutrient cycling and the growth of new plants. The biologically active upper layer of the soil is fundamental in the maintenance of the entire ecosystem;
- Topsoil should be retained on site in order for site rehabilitation. The correct handling of the topsoil is a key element to rehabilitation success. Firstly, it is important that the correct depth of topsoil is excavated. If the excavation is too deep, the topsoil will be mixed with sterile deeper soil, leading to reduction in nutrient levels and a decline in plant performance on the soil;
- Wherever possible, stripped topsoil should be placed directly onto an area being rehabilitated. This avoids stockpiling and double handling of the soil. Topsoil placed directly onto rehabilitation areas contains viable seed, nutrients and microbes that allow it to revegetate more rapidly than topsoil that has been in stockpile for long periods;
- If direct transfer is not possible, the topsoil should be stored separately from other soil heaps until construction in an area is complete. The soil should not be stored for a long time and should be used as soon as possible. The longer the topsoil is stored, the more seeds, micro-organisms and soil biota become sterile;
- Ideally stored topsoil should be used within a month and should not be stored for longer than three months. In addition, topsoil stores should not be too deep, a maximum depth of 1m is recommended to avoid compaction and the development of anaerobic conditions within the soil;
- If topsoil is stored on a slope, then sediment fencing should be used downslope of the stockpile to intercept any sediment and runoff should be directed away from the stockpile's upper edge;
- Reduced activity at the site after large rainfall events when the soils are wet is encouraged. No driving outside hardened roads should occur immediately following large rainfall events until soils have dried out and the risk of bogging down has decreased;
- Topsoil, waste rock or other material dumps should be protected from erosion with silt traps and other suitable prevention measures;
- Gabions and other stabilisation features should be used during construction activities on steep slopes to prevent erosion.

## 4. REHABILITATION METHODS AND PRACTISES

The following general management principles are encouraged:

- Immediately after replacing topsoil in disturbed areas, the soil surface must be revegetated with a suitable local indigenous plant cover.
- It is expected that soil seed banks of indigenous vegetation will be present to initiate initial vegetation cover. However, simply applying this topsoil to a well-prepared rehabilitation site does not result in the same species richness and diversity as the surrounding areas. In some areas the natural regeneration of the vegetation may be poor and the application of suitable seed to enhance vegetation recovery may be required.

- Where possible and required seed collection should be undertaken by a suitably qualified specialist who is familiar with the various seed types associated with the plant species and rehabilitation in the area.
- Seed collection may be done throughout the year as seed ripens, but can also be restricted to summer, when a large amount of the perennial seed should have ripened. The collection of unripe seeds will reduce the percentage germination thereby reducing the effectiveness of the rehabilitation efforts. Seeds should be stored in paper or canvas bags dusted with insecticide and sown at the onset of the rainy season.
- Seed can be sown onto the soil but should preferably be applied in conjunction with measures to improve seedling survival such as scarification of the soil surface or simultaneous application of mulch. Additional organic material may be added to the soil mix, if required, to assist with water retention during the early stages of seedling establishment.
- It should be ensured that the seed mix is as diverse as possible in the first season. After the first season, when pioneer plant communities have successfully established, attempts should be made to re-sow and replant the area with more perennial and woody species. It is a process that will require several follow-ups.
- Planting is dependent on species involved. Planting of species recommended for rehabilitation should be carried out as far as is practicable to coincide with the onset of the first significant rains. In general, however, planting should commence as soon as possible after construction is completed in order to minimise the potential for erosion.
- The final vegetation cover should resemble the original (non-encroached and indigenous) vegetation composition and structure as far as practicably possible.
- Progressive rehabilitation is an important element of the rehabilitation strategy and should be implemented where feasible. Re-vegetation of disturbed surfaces must occur immediately after construction activities are completed.
- Once revegetated, areas should be protected to prevent trampling and erosion.
- No construction equipment, vehicles or unauthorised personnel should be allowed onto areas that have been vegetated.
- Any rills, erosion channels or wash aways developing after revegetation should be backfilled and consolidated and the areas restored to a proper stable condition.
- On steep slopes or areas with high risk of soil erosion, soil savers and mulching must be used to stabilise the soil surface. Soil savers are man-made materials, usually constructed of organic material such as hemp or jute and are usually applied in areas where traditional rehabilitation techniques are not likely to succeed. Mulching is the covering of the soil with a layer of organic matter of leaves, twigs bark or wood chips, usually chopped quite finely. The main purpose of mulching is to protect and cover the soil surface as well as serve as a source of seed for revegetation purposes.
- Where rehabilitation is located within actively grazing areas, rehabilitated land should be fenced off to prevent disturbance from livestock. This must be done in consultation with landowners and farmers.
- Fencing of rehabilitated areas must be removed once ample vegetation cover has been established.

## 5. MONITORING AND FOLLOW-UP ACTION

Throughout the lifecycle of the development, regular monitoring and adaptive management must be in place to detect any new degradation of rehabilitated areas. During the construction phase, the Environmental Manager (EM) and Contractor will be responsible for initiating and maintaining a suitable monitoring system. Once the development is operational, the developer will need to identify a suitable entity that will be able to take over and maintain the monitoring cycle and initiate adaptive management. Monitoring personnel must be adequately trained.

The following are the minimum criteria that should be monitored:

- Composition and density of replanted vegetation.
- Associated nature and stability of surface soils
- Re-emergence of alien and invasive plant species. If noted, remedial action must be taken.

Rehabilitation success, monitoring and follow-up actions are important to achieve the desired cover and soil protection. The following monitoring protocol is recommended:

- Re-vegetated areas should be monitored every 3 months for the first 12 months, or as per the recommendations of the specialist.
- Re-vegetated areas showing inadequate surface coverage (less than 30% within 12 months after revegetation) should be prepared and re-vegetated.
- Ensure that steep slopes are not de-vegetated unnecessarily and subsequently become hydrophobic, i.e.. Lower infiltration and higher run off resulting in higher erosion potential.
- Any areas showing erosion, should be re-contoured and seeded with indigenous grasses or other locally occurring species which grow quickly.
- If the plants have not established and the acceptable plant cover is not achieved within the specified maintenance period, maintenance of these areas shall continue until an acceptable plant cover is achieved (excluding alien plant species or weeds). Additional seeding or planting may be necessary to achieve acceptable plant cover. Hand seeding may have to be considered as an option in this case.

Monitoring of rehabilitation success and follow-up adaptive management, together with clearing of emerging alien plant species should continue for as long as considered necessary.

## 6. CONCLUDING STATEMENT

Rehabilitation of disturbed areas is of great importance in any proposed development and if the methods/measures mentioned in this plan and the EMPr are properly implemented, it can minimize the risk of erosion and establishment of alien invasive species. Disturbed areas should be re-vegetated with preferably indigenous species instead of alien plant, and any newly established alien plant should be removed on site. Monitoring to ensure that the vegetation planted is growing well and there is no establishment of alien plants should be implemented.

# APPENDIX D

## SCC RESCUE AND PROTECTION PLAN

Jones & Wagener
Engineering & Environmental Consultants
59 Bevan Road PO Box 1434 Rivonia 2128 South Africa
tel: 00 27 11 519 0200 www.jaws.co.za email: post@jaws.co.za

# SPECIES OF CONSERVATION CONCERN (SCC) RESCUE AND PROTECTION PLAN FOR PHULA PV FACILITY

## 1. INTRODUCTION

K2022578590 (South Africa) Proprietary Limited (hereafter referred to as the Applicant) is proposing to develop a Solar Photovoltaic (PV) energy facility and associated infrastructure (hereafter referred to as "Phula PV project")[1] on the Remainder of, and Portion 2 of the farm De Grooteboom 373 KT in the Limpopo Province. The proposed project site is situated in close proximity to the local chrome and platinum mines near Steelpoort, 33 km south-east of the town of Mashishing/Lydenburg.

The development area of approximately 249 hectares (ha) was identified by The Applicant as a suitable area for the Phula PV project. The Solar PV planned generation capacity output will be up to 130 Megawatts (MW). The proposed Phula PV project is being developed with the aim of generating renewable energy to supply to the national grid under the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or similar procurement programme.

This SCC Rescue and Protection Plan is compiled in support of the Environmental Management Programme for the development Phula PV Facility project. The main aim is to provide a framework for the management of SCC during the construction and operation of the Phula PV Facility.

## 2. PURPOSE

The purpose of the SCC Rescue and Protection Plan is to ensure that listed and protected species and their habitats are avoided during construction and operation. In the event that a protected species is found and identified within an area demarcated for construction or clearing, this plan provides mitigation measures, in addition to measures included in the EMPr, to reduce the impact of the project on listed and protected species as well as their habitats. The SCC Rescue and Protection Plan is required in order to ensure accordance with national and provincial legislation for vegetation clearing and any required destruction or translocation of nationally or provincially protected species within the development footprint.

Furthermore, this plan forms part of the broader EMPr and provides practical guidance on search and rescue of threatened or protected species (TOPS). The main objective of this plan is to identify, remove, rescue or translocate identified SCC on the proposed development area.

[1] It should be noted that the proposed project was previously referred to as the Platinum PV project. However subsequent to Approval of Scoping the Applicant was required to change the name of the proposed project due to requirements from Eskom's Grid Access Unit (GAU). A notification regarding the name change has been provided to stakeholders.

## 3. SPECIES OF CONSERVATION CONCERN (SCC)

Both faunal and floral species are protected at national and provincial levels and different permits may be required to disturb, remove or relocate SCCs depending on their protection level. At a national level, protected species are listed by the Department of Forestry, Fisheries and the Environment (DFFE) under the Threatened or Protected Species (TOPS) (14 December 2007 as amended) and the National List of Protected Trees, which is updated regularly. These species are protected by the following legislation and any clearing or relocation of these species will require a permit from the DFFE:

- National Environmental Management Biodiversity Act (Act 10 of 2004), including TOPS Regulations;
- National Environmental Management Act (Act 107 of 1998);
- National Forests Act (Act 30 of 1998).

At the provincial level, all species listed under the following frameworks and legislation are protected and require provincial permits:

- Red List of South African Plants (http://redlist.sanbi.org/index.php);
- Limpopo Environmental Management Act (Act 7 of 2003).

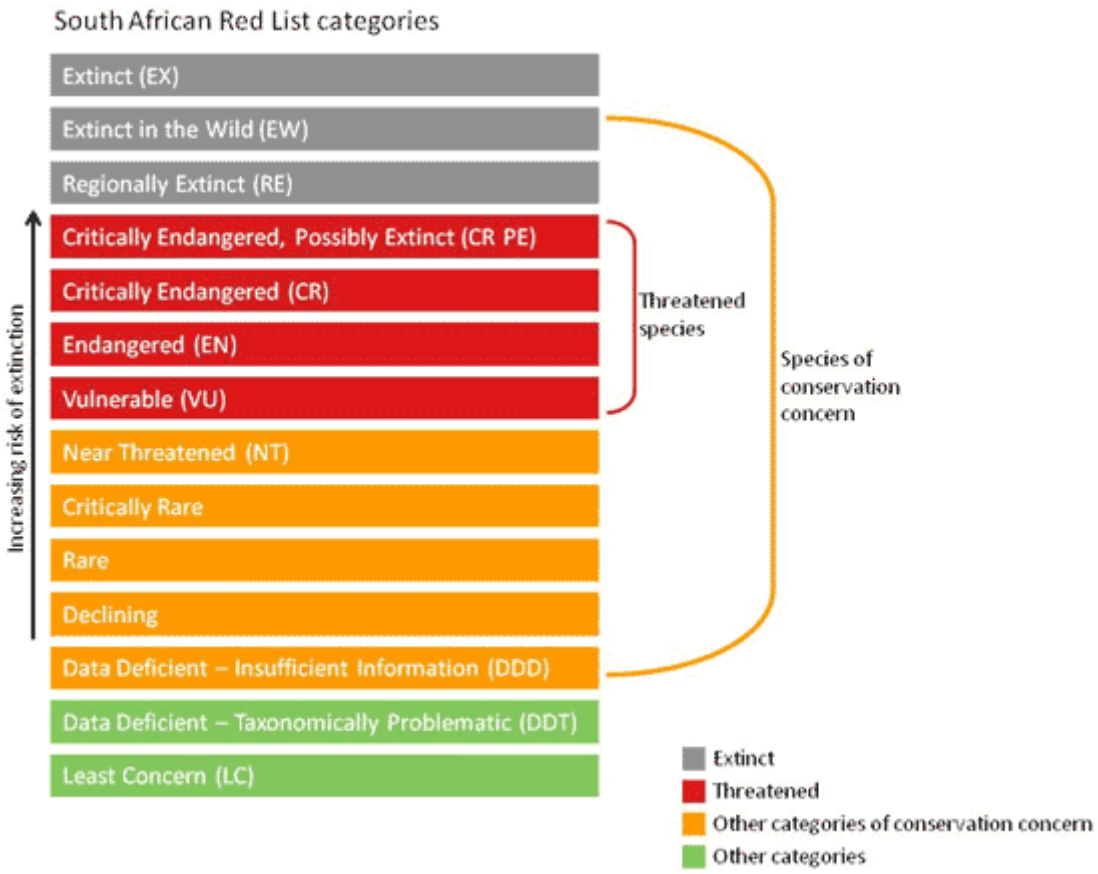


**Figure 3-1: South African Red List categories (SANBI)**

## 4. PRINCIPLES FOR AVOIDANCE, MITIGATION AND RESCUE

The primary avoidance and mitigation measures must be implemented during the pre-construction phase. A site walk-through and ground-truthing of the development footprint

will define how many SCC or TOPS are found within or in close proximity to the development footprint.

The ecosystem within the footprint of the development, with all its species diversity, genetic variation and ecological interrelationships will be lost and the objective is to salvage something prior to the destruction. Some considerations are as follows:

- The rescue of species is considered as a last resort and typically only a small proportion of species can be salvaged. This is due to the practical limitations of translocating species in terms of seasonality, species resilience to disturbance, probability of survival and other ecological and logistical factors (Conant, 1988). For example, the majority of woody species do not survive translocation and hence it is not practical to translocate them. In this instance, a permit will be required to clear such vegetation.
- A suitably qualified and experienced botanist or zoologist or relevant biodiversity specialist must be contracted to undertake a search and rescue of TOPS prior to construction of the project.
- Plants chosen for rescue may not thrive or even survive. It is highly unlikely that all rescued plants will survive. This is because it is virtually impossible to predict without experimentation and research exactly what artificial conditions will be required for the management of each species in order to ensure survival.
- Various agencies globally (e.g. IUCN) and nationally (e.g. SANBI) have expressed concern regarding the concept of species rescue. The concern is that the implementation of a Search and Rescue can weaken support for habitat conservation by fostering the perception that rescuing selected plants or animals can compensate for destruction of an entire habitat, or that landscape plantings can substitute for natural areas.
- Translocation of species must occur in areas that are as close to the development site as possible and within the same habitat type. Removing species from their natural habitat and introducing them into different habitat types may:
    - be harmful to the receiving ecosystem by altering the species composition and abundance;
    - lead to the transmission of pathogens and parasites (Hodder & Bullock, 1997);
    - lead to changes in the phenotypic and genotypic makeup of the species (Conant, 1988);
    - reduce the probability of survival of translocated species which will prevent the establishment of viable populations (Milton, *et al.*, 1999).
- Habitats that are currently disturbed/transformed and that are outside the development footprint are possible sites for rehabilitation where a positive biodiversity outcome can be locally achieved.
- Rescue must be limited to only those areas where SCCs will be destroyed by the development. No SCCs should be removed from areas that will otherwise not be disturbed.
- In instances where individual plants are unviable to translocate, seed or other propagules (cuttings) can be collected to be planted in similar habitats outside of the development footprint.
- Rescue should not be undertaken from any site where there is a significant risk that well-established invasive alien plants or other pests will be spread by the relocation of native species.

## 5. RESCUE AND PROTECTION PLAN

**Table 5-1** details the management actions to be undertaken during all phases of the project development to ensure that the SCC rescue and protection management plan is sufficient .

**Table 5-1: Rescue and protection plan**

| ACTION | RESPONSIBLE PERSON |
|---|---|
| Pre-construction | |
| Initial identification of all listed species that may occur within the project area. This is usually conducted during the biodiversity specialist assessments. | Biodiversity specialist or botanist or zoologist or relevant specialist |
| The footprint of proposed development must be marked out prior to the inception of construction or clearing of natural habitat. | Contractor or Developer |
| A site walk-through of the final development footprint must be done by a suitably qualified individual to identify and locate affected SCCs or TOPS. A walk-through report must be compiled highlighting the species, the number of individuals and the spatial extent affected. SCCs and TOPS suitable for translocation or rescue should be stated in this report. | Biodiversity specialist or botanist or zoologist or relevant specialist |
| Acquire required national and/or provincial permits to remove or relocate SCCs or TOPS must be acquired from the relevant competent authority | Environmental Officer |
| Once permits have been acquired, the search and rescue operation can commence. All listed or protected species that could not have been avoided, and have been identified in the walk-through as being suitable for translocation, should be removed and replanted in a similar habitat as close to the development footprint as possible. Translocated species should be marked for monitoring purposes. | Biodiversity specialist or botanist or zoologist or relevant specialist |
| All construction staff should be trained on the importance of SCCs and TOPS and their conservation. | Environmental Officer |
| Construction | |
| All cleared vegetation must be handled according to the Revegetation and Rehabilitation Plan and used to encourage the recovery of disturbed areas. | Environmental Officer |
| Any deviations from the final clearing and development plans should be checked for listed or protected species. Any SCC or TOPS present must be brought to the notice of the biodiversity specialist who will carry out the | Environmental Officer<br>Biodiversity specialist or botanist or zoologist or relevant specialist |

| ACTION | RESPONSIBLE PERSON |
|---|---|
| necessary procedures to determine the feasibility of translocating the species. | |
| Any SCC or TOPS that were missed during the pre-construction site sweeps should be brought to the attention of the biodiversity specialist before being cleared or relocated. | Environmental Officer |
| Clearing of vegetation must be monitored to avoid sensitive areas, SCCs and TOPS. | Environmental Officer |
| Operation | |
| The collection, removal, disturbance or destruction of SCCs and TOPS that remain on site is strictly forbidden and signs stating such should be placed strategically. | Environmental Officer |

## 6. MONITORING AND REPORTING

The following monitoring activities are recommended as part of the SCC Rescue and Protection Plan:

- Post-relocation monitoring of plants and animals relocated during search and rescue to evaluate whether the intervention was successful or not. This should be undertaken on a three-monthly basis over a period of two years in order to evaluate the success thereof.
- Provision of a detailed record, including photographs, that indicates the success of the plant rescue operation.

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